

# DOCKET NO. 21-ZONE-0059

ZONE CHANGE FROM R-R TO R-4  
AND A LDC 4.7.7 BALANCED  
TRANSFER SUBDIVISION TO ALLOW A  
180-LOT SINGLE FAMILY SUBDIVISION  
ON PROPERTY LOCATED AT  
10212 AND 10302 OAK GROVE ROAD  
(PREVIOUSLY PROPOSED WITH 263 LOTS)

## Louisville Metro Planning Commission Public Hearing June 2, 2022

Louisville Metro Land Development &  
Transportation Committee  
May 19, 2022

2<sup>nd</sup> Neighborhood Meeting  
April 12, 2022

Louisville Metro Council  
Remanded to Planning Commission  
March 17, 2022

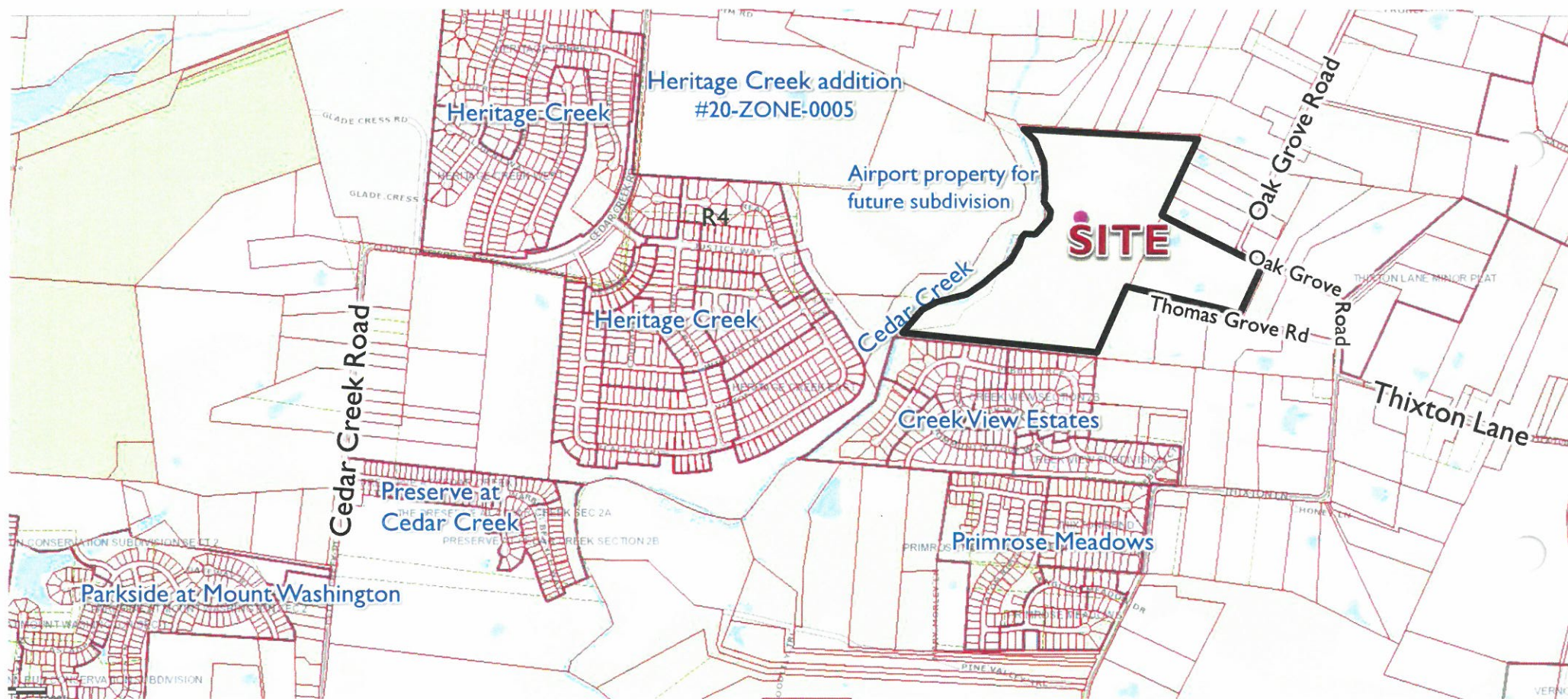
Louisville Metro Planning  
Commission Public Hearing  
December 16, 2021

Louisville Metro Land Development &  
Transportation Committee  
November 11, 2021

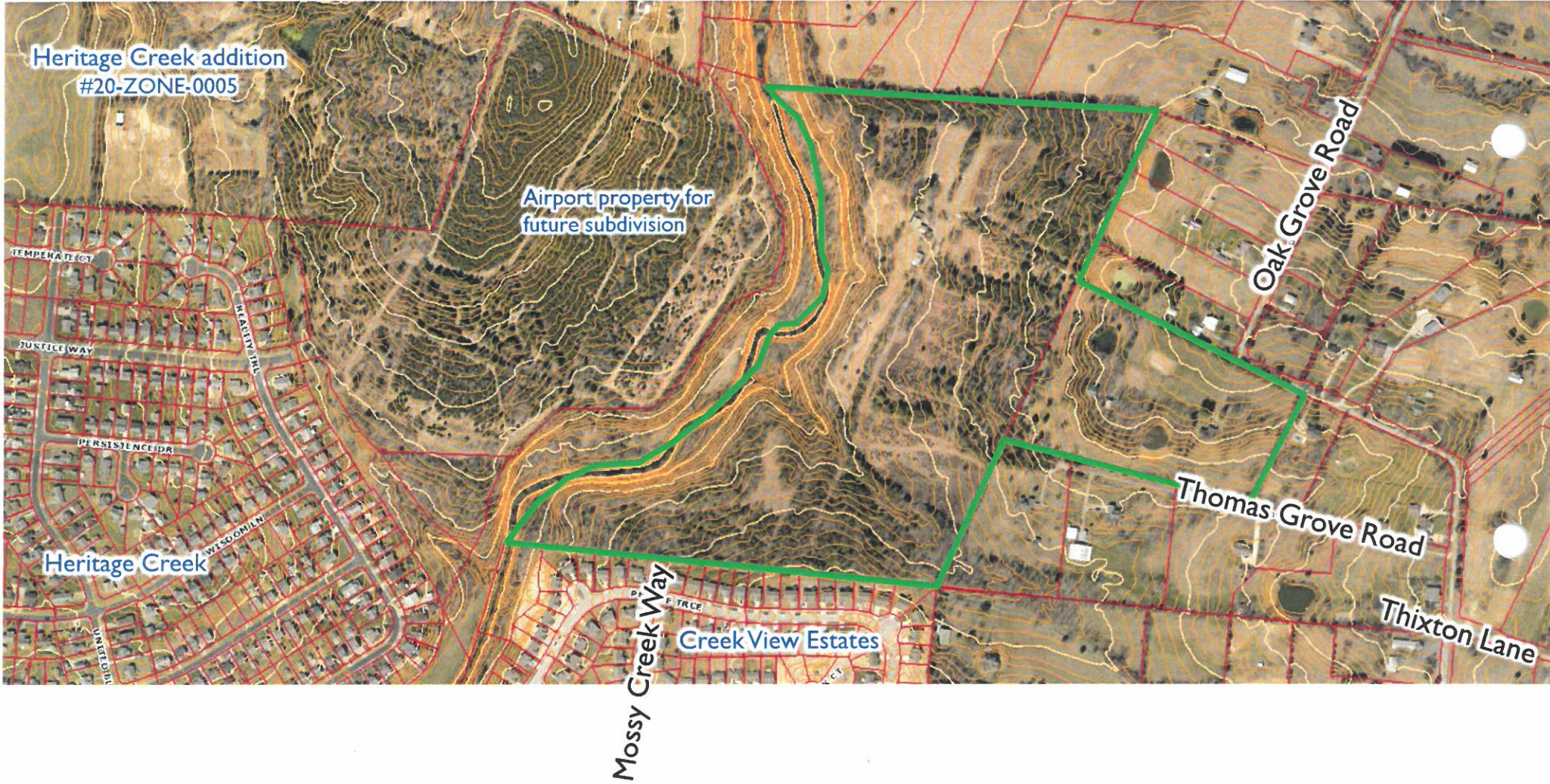
Neighborhood Meeting  
April 19, 2021

Attorneys: Bardenwerper Talbott & Roberts, PLLC  
Land Planners, Landscape Architects & Engineers: Mindel Scott & Associates, Inc.  
Traffic Engineer: Diane B. Zimmerman  
Ecological Consultant: RES (Redwing)









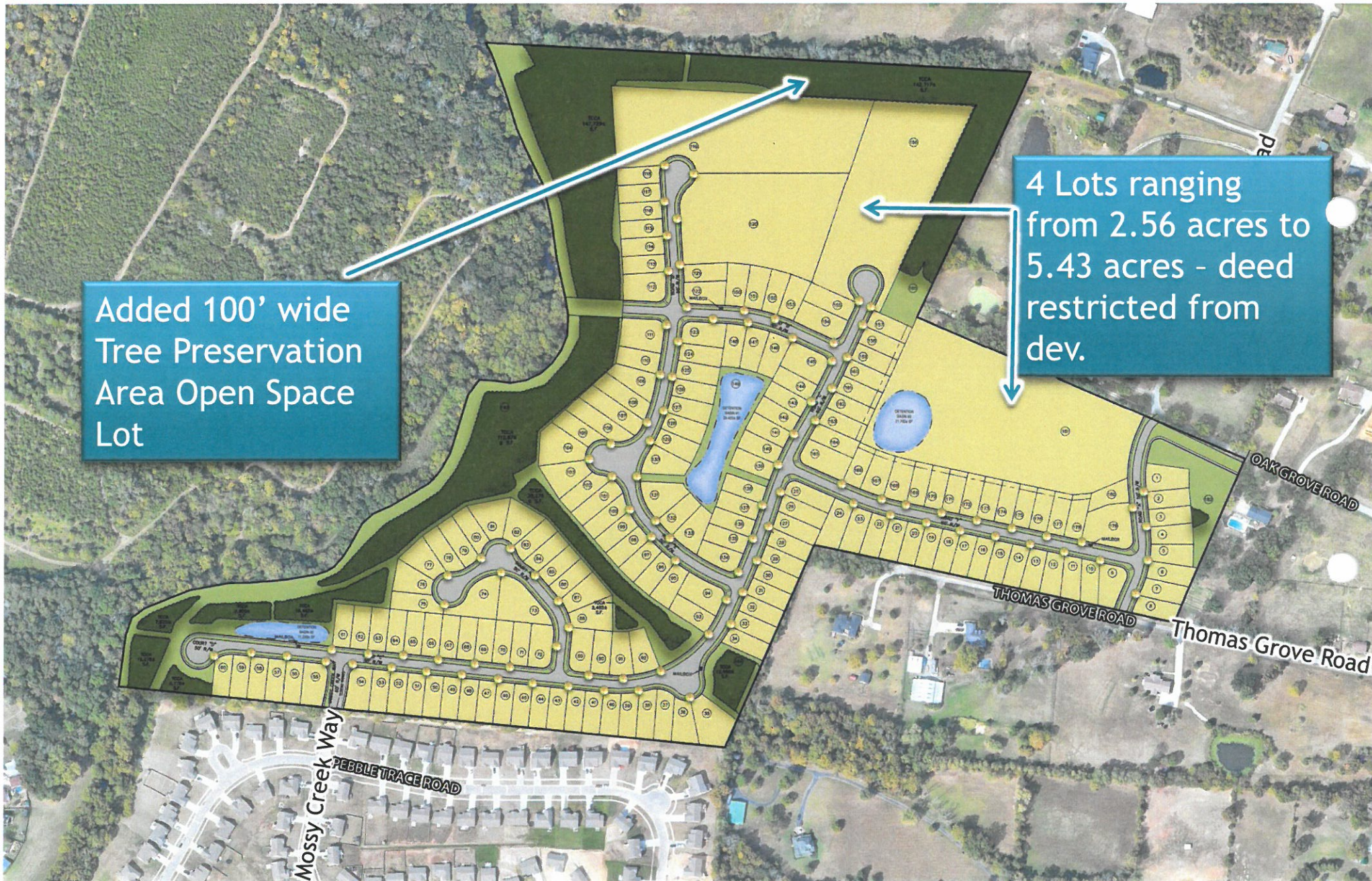


Plan shown at the 12/16/21 Planning Commission Hearing  
263 Lot R-4 Density Transfer Subdivision



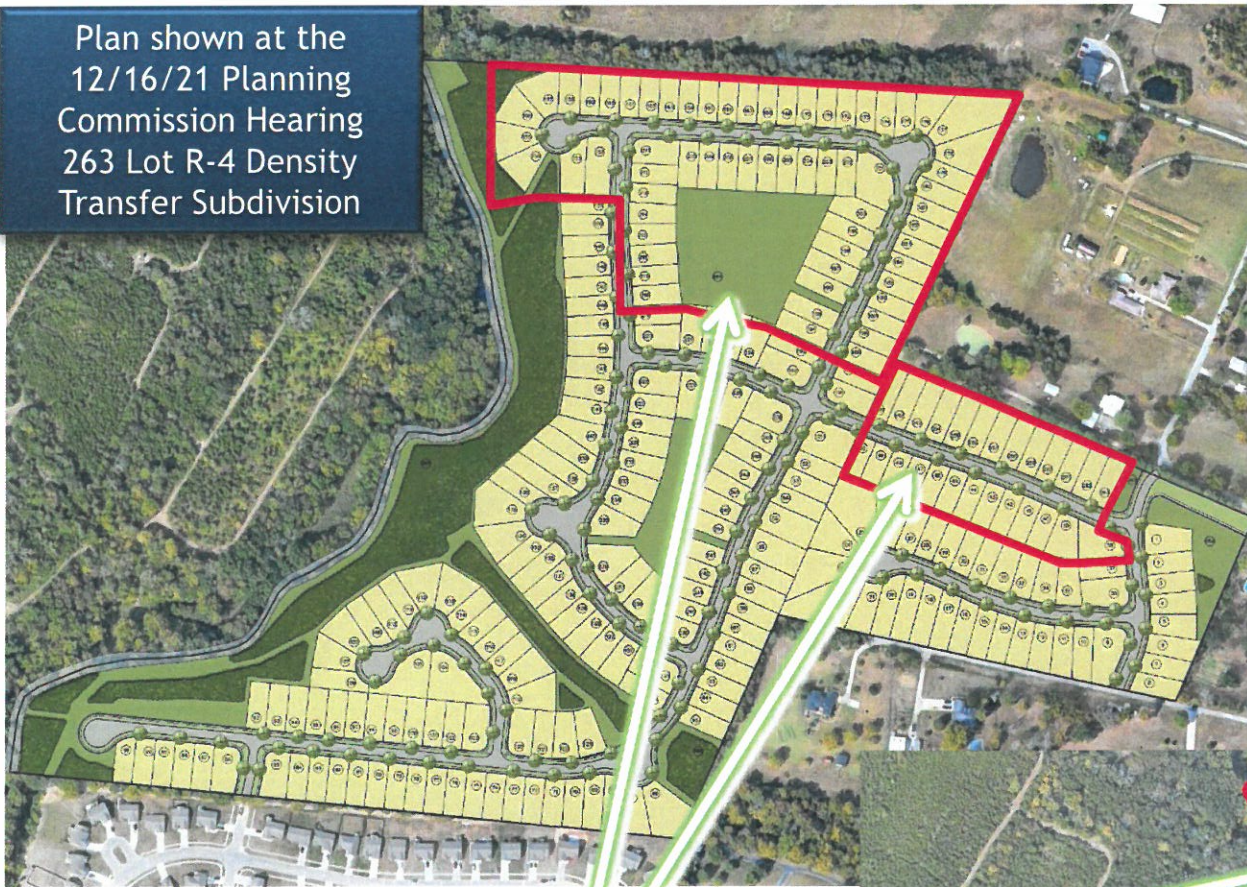


# Proposed subdivision plan - 80 fewer lots



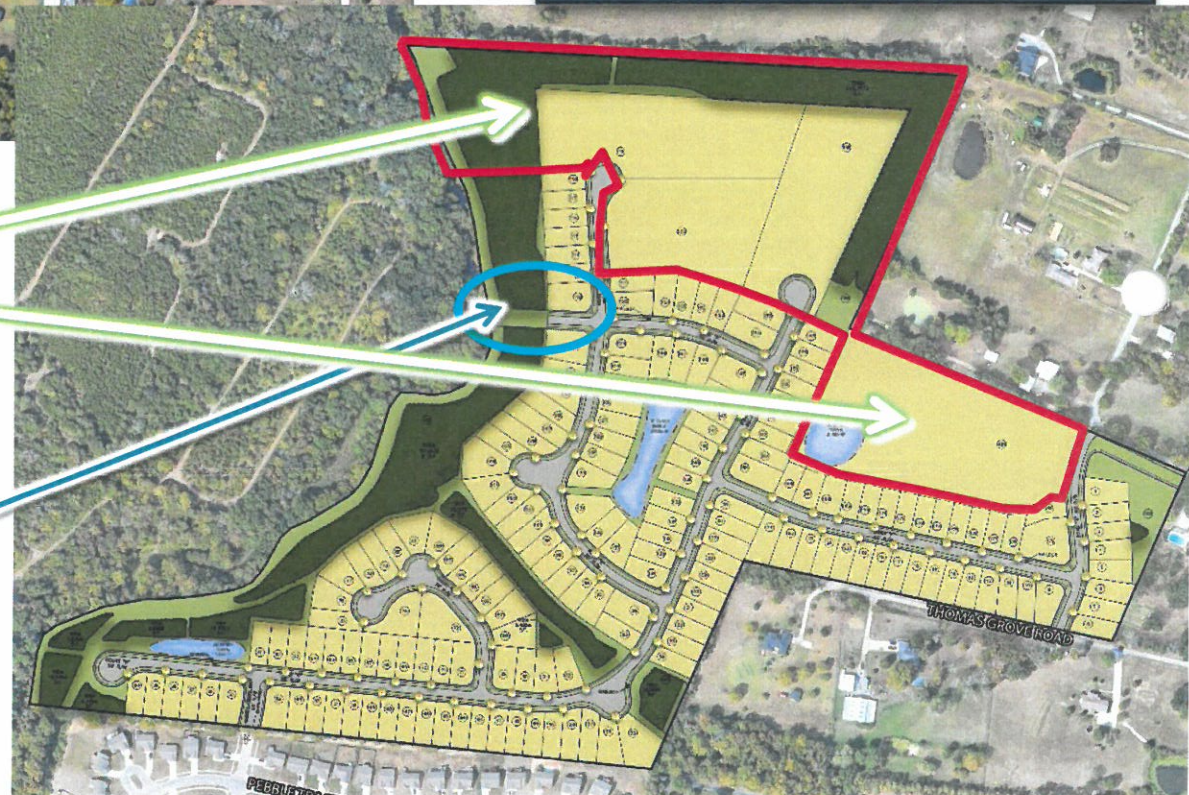


Plan shown at the  
12/16/21 Planning  
Commission Hearing  
263 Lot R-4 Density  
Transfer Subdivision



Lots removed

Proposed plan  
180 Lot R-4 Density Transfer  
Subdivision



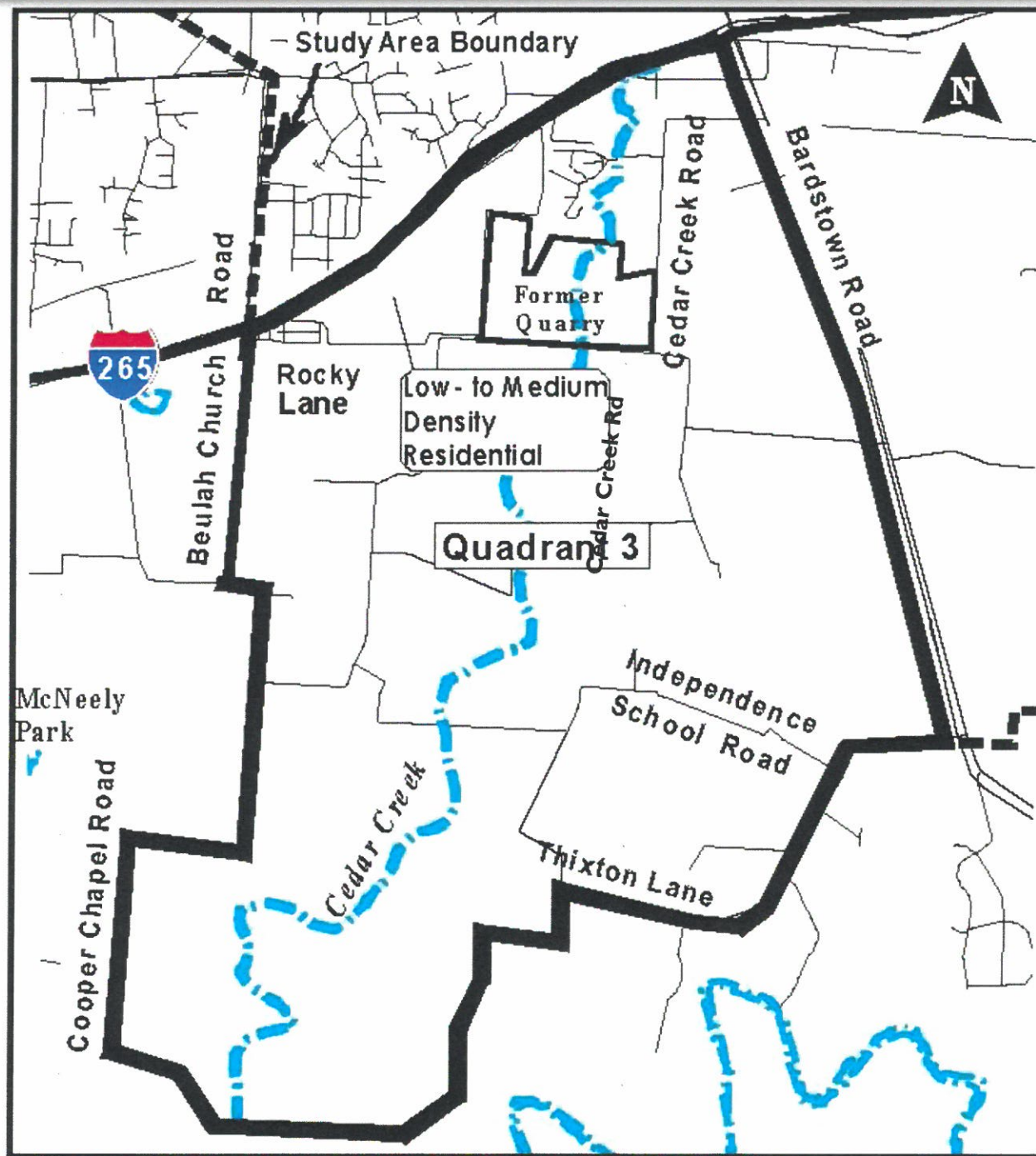
Added stub connection



|                              | Previous Plan | Revised Plan                 | Difference             |
|------------------------------|---------------|------------------------------|------------------------|
| Tree Canopy Required (S.F.)  | 1,194,764     | 1,194,764                    | 0                      |
| Tree Canopy Preserved (S.F.) | 313,479       | 505,928<br>(34% of existing) | 192,449<br>(4.4 acres) |
| Open Space Required          | 373,507       | 373,507                      | 0                      |
| Open Space Provided          | 687,048       | 785,659                      | 98,611<br>(2.25 acres) |

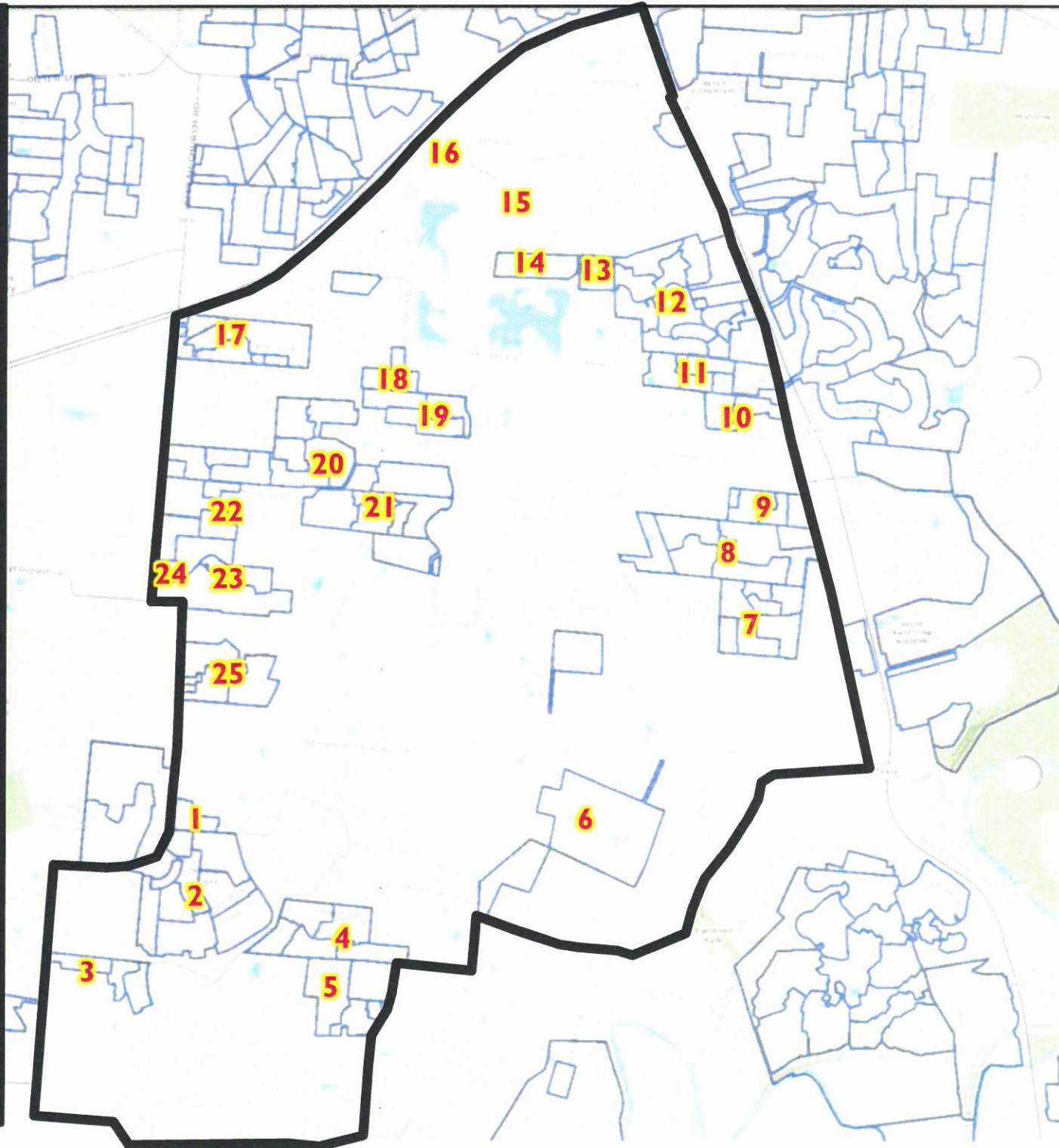


## Quadrant 3 of 2001 Fern Creek Small Area Plan



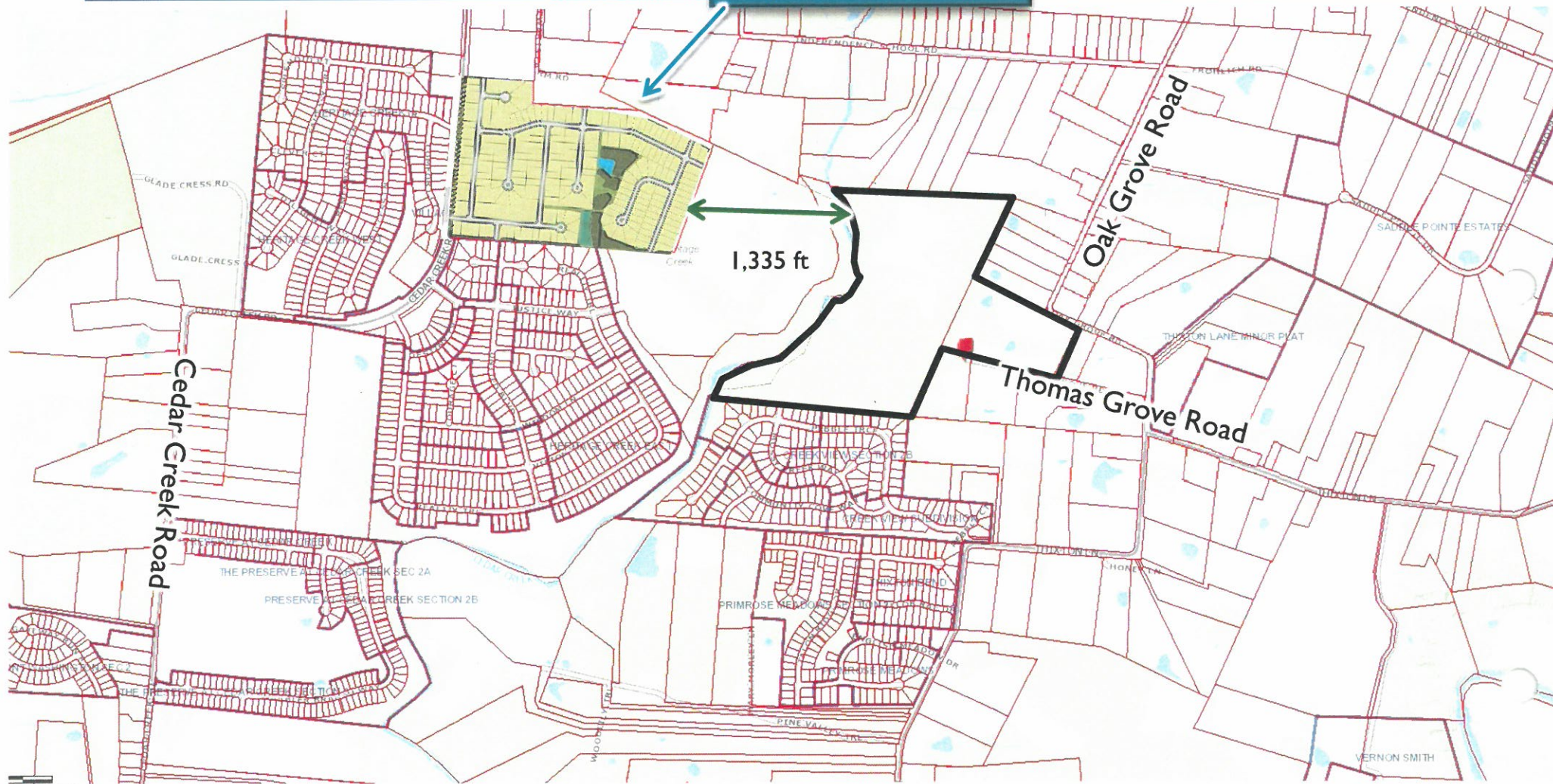


1. Heritage Creek extension
2. Heritage Creek
3. The Preserve at Cedar Creek
4. Creekview
5. Primrose Meadows
6. Saddle Point Estates
7. Tuscany Ridge
8. Bardstown Woods
9. Cambridge Commons
10. Trails Crossing
11. Glenmary Cove and Glenmary Commons
12. Glenmary
13. Cedar Ridge
14. Cedar Creek Gardens
15. Cedar Creek Springs 88 lots
16. Cedar Heights 39 lots
17. Beulah Church Road
18. Cedar Meadows
19. Cedar Glen
20. Adams Run
21. Creekview Estates
22. Woodridge Estates
23. Woodridge Crossings
24. Saddle Ridge
25. Cedar Brook





**Heritage Creek Ext.  
(20-ZONE-0005)**



**Heritage Creek Extension**

Zoned R-5

4.02 du/a

No road improvements

**Subject Site**

R-4 request

2.62 du/a

Proposed road improvements



Preserve at Cedar Creek  
(18SUBDIV013)

Cedar Creek Road

Oak Grove Road

Thomas Grove Road

3,129 ft

### Preserve at Cedar Creek

Zoned R-4

3.94 du/a

No road improvements

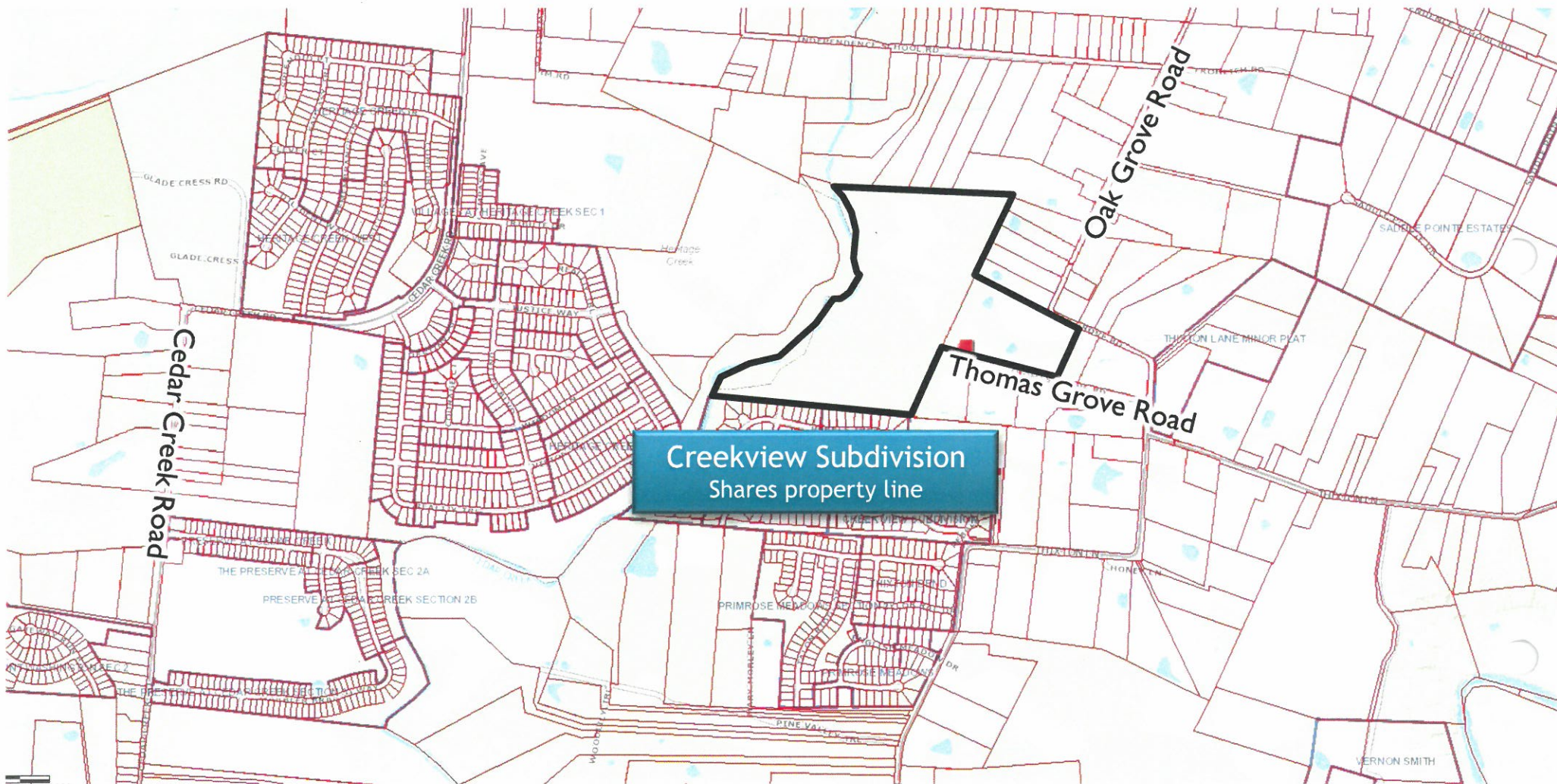
### Subject Site

R-4 request

2.62 du/a

Proposed road improvements





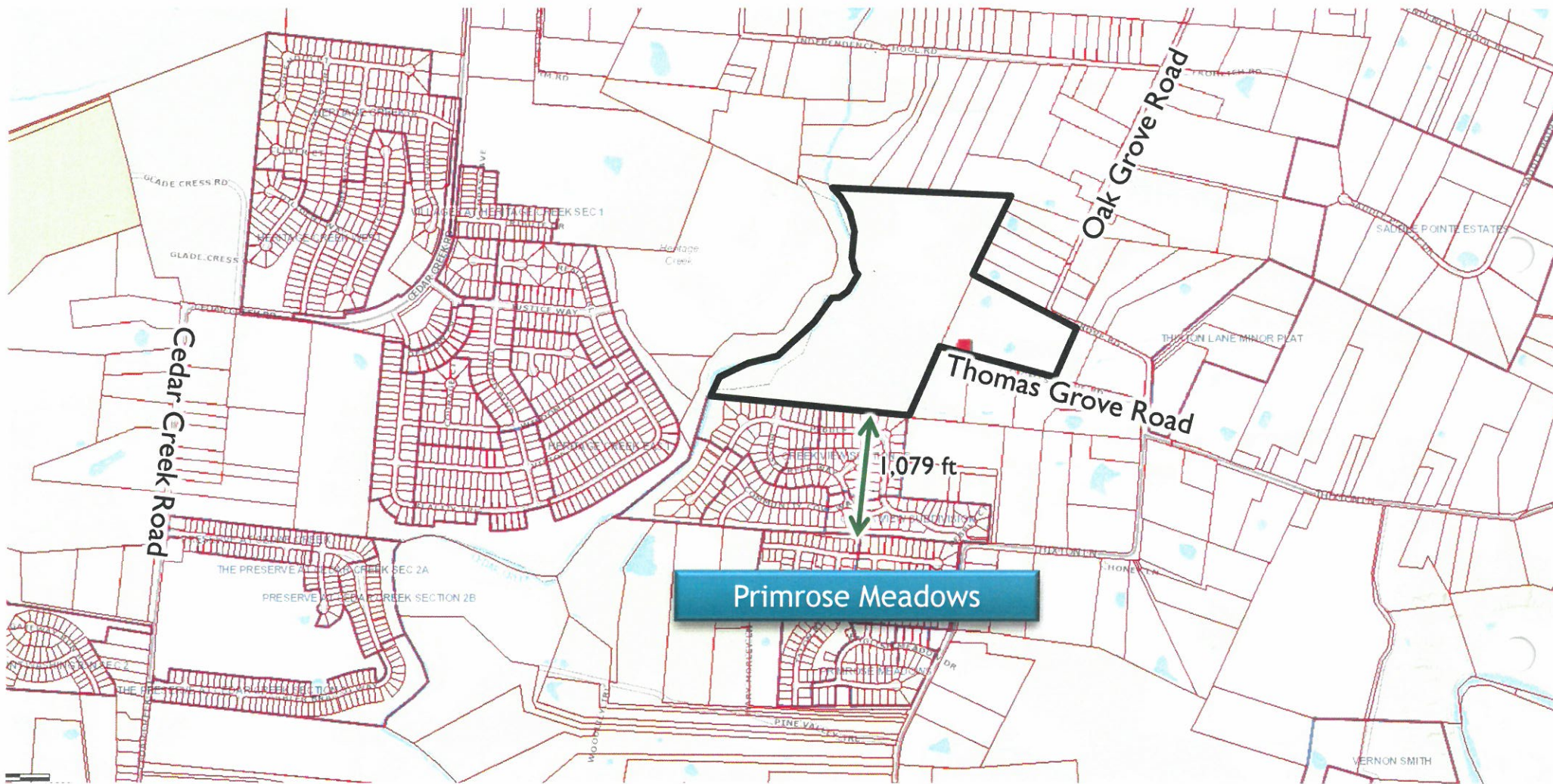
**Creekview Subdivision**

**Zoned R-4**

**Subject Site**

**R-4 request**





**Primrose Meadows**

**Zoned R-4**

**Subject Site**

**R-4 request**



# final report

May 9, 2022

## Traffic Impact Study

Oak Grove Subdivision  
10212 Oak Grove Road  
Louisville, KY

Prepared for

Louisville Metro Planning Commission

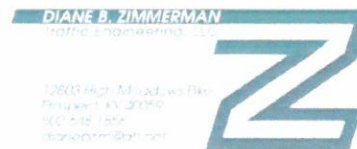




Table 2. Peak Hour Level of Service

| Approach                                       | A.M.             |                  |               | P.M.             |                  |               |
|------------------------------------------------|------------------|------------------|---------------|------------------|------------------|---------------|
|                                                | 2021<br>Existing | 2027<br>No Build | 2027<br>Build | 2021<br>Existing | 2027<br>No Build | 2027<br>Build |
| <b>Cedar Creek Road at Independence School</b> |                  |                  |               |                  |                  |               |
| Independence School Road Eastbound             | A<br>8.8         | A<br>8.9         | A<br>8.9      | A<br>9.1         | A<br>9.2         | A<br>9.2      |
| Independence School Road Westbound             | B<br>10.1        | B<br>10.4        | B<br>10.7     | B<br>10.9        | B<br>11.3        | B<br>11.7     |
| Cedar Creek Road Northbound                    | A<br>7.3         | A<br>7.3         | A<br>7.3      | A<br>7.3         | A<br>7.3         | A<br>7.3      |
| Cedar Creek Road Southbound                    | A<br>7.7         | A<br>7.7         | A<br>7.6      | A<br>7.9         | A<br>8.0         | A<br>8.1      |
| <b>Oak Grove Road at Thixton Lane</b>          |                  |                  |               |                  |                  |               |
| Thixton Lane Westbound                         | A<br>9.5         | A<br>9.6         | B<br>10.5     | B<br>10.0        | B<br>10.2        | B<br>11.9     |
| Oak Grove Road Southbound                      | A<br>8.1         | A<br>8.2         | A<br>8.4      | A<br>7.8         | A<br>7.8         | A<br>7.8      |
| <b>Oak Grove Road at Entrance</b>              |                  |                  |               |                  |                  |               |
| Oak Grove Road Westbound                       |                  |                  | A<br>8.8      |                  |                  | A<br>9.3      |
| Oak Grove Road Southbound                      |                  |                  | A<br>7.4      |                  |                  | A<br>7.4      |
| <b>Thixton Lane at Pebble Trace</b>            |                  |                  |               |                  |                  |               |
| Thixton Lane Eastbound                         | A<br>7.4         | A<br>7.5         | A<br>7.5      | A<br>7.6         | A<br>7.7         | A<br>7.8      |
| Pebble Trace Southbound                        | A<br>9.7         | A<br>9.8         | B<br>10.4     | B<br>10.4        | B<br>10.6        | B<br>11.5     |
| <b>Bardstown Road at Thixton Lane</b>          |                  |                  |               |                  |                  |               |
| Thixton Lane Eastbound                         | B<br>14.9        | B<br>16.0        | B<br>14.9     | C<br>29.3        | C<br>32.4        | D<br>42.7     |
| Bardstown Road Northbound                      | D<br>43.3        | D<br>44.4        | E<br>68.4     | E<br>64.8        | E<br>69.1        | E<br>67.3     |
| Bardstown Road Southbound                      | B<br>12.3        | B<br>13.4        | A<br>9.9      | B<br>13.7        | B<br>16.2        | B<br>19.9     |
| Bardstown Road Southbound                      | B<br>15.4        | B<br>16.3        | B<br>13.0     | C<br>32.6        | D<br>35.4        | D<br>51.3     |

Key: Level of Service, Delay in seconds per vehicle



|                                       | A.M.              |                   |                   | P.M.              |                   |                   |
|---------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Approach                              | 2021<br>Existing  | 2027<br>No Build  | 2027<br>Build     | 2021<br>Existing  | 2027<br>No Build  | 2027<br>Build     |
| <b>Bardstown Road at Thixton Lane</b> | <b>B<br/>14.9</b> | <b>B<br/>16.0</b> | <b>B<br/>14.9</b> | <b>C<br/>29.3</b> | <b>C<br/>32.4</b> | <b>D<br/>42.7</b> |
| Thixton Lane Eastbound                | D<br>43.3         | D<br>44.4         | E<br>68.4         | E<br>64.8         | E<br>69.1         | E<br>67.3         |
| Bardstown Road Northbound             | B<br>12.3         | B<br>13.4         | A<br>9.9          | B<br>13.7         | B<br>16.2         | B<br>19.9         |
| Bardstown Road Southbound             | B<br>15.4         | B<br>16.3         | B<br>13.0         | C<br>32.6         | D<br>35.4         | D<br>51.3         |

Key: Level of Service, Delay in seconds per vehicle

**Table 3. Bardstown Road at Thixton Lane with a right turn lane on Thixton Lane**

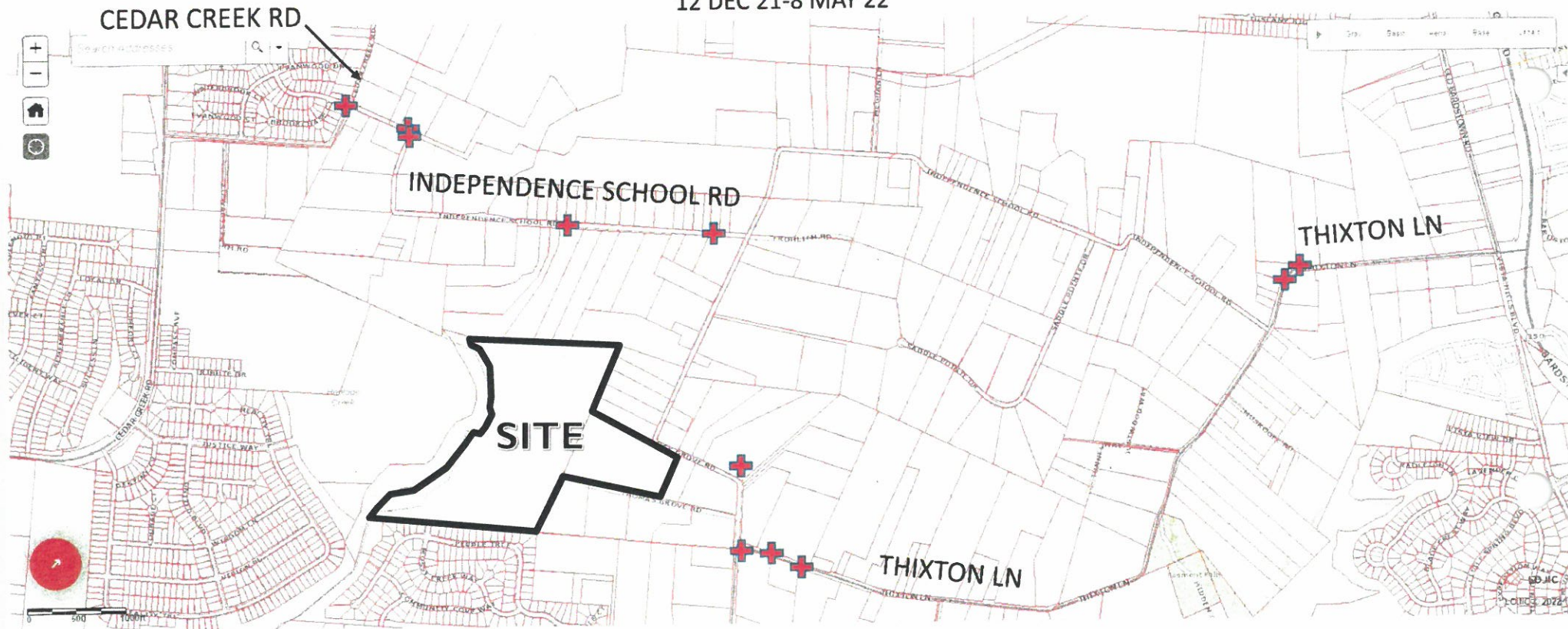
|                                       | A.M.              |                                   | P.M.              |                                   |
|---------------------------------------|-------------------|-----------------------------------|-------------------|-----------------------------------|
| Approach                              | 2027<br>Build     | 2027<br>Build<br>Thixton Ln Right | 2027<br>Build     | 2027<br>Build<br>Thixton Ln Right |
| <b>Bardstown Road at Thixton Lane</b> | <b>B<br/>14.9</b> | <b>B<br/>10.7</b>                 | <b>D<br/>42.7</b> | <b>C<br/>23.5</b>                 |
| Thixton Lane Eastbound                | E<br>68.4         | D<br>52.0                         | E<br>67.3         | E<br>64.7                         |
| Bardstown Road Northbound             | A<br>9.9          | A<br>6.7                          | B<br>19.9         | B<br>11.9                         |
| Bardstown Road Southbound             | B<br>13.0         | A<br>9.4                          | D<br>51.3         | C<br>22.6                         |

Developer to construct a right-hand turn lane on eastbound Thixton Lane between the west side of Old Bardstown Road to the east side of New Bardstown Road, per details from the Kentucky Transportation Cabinet.

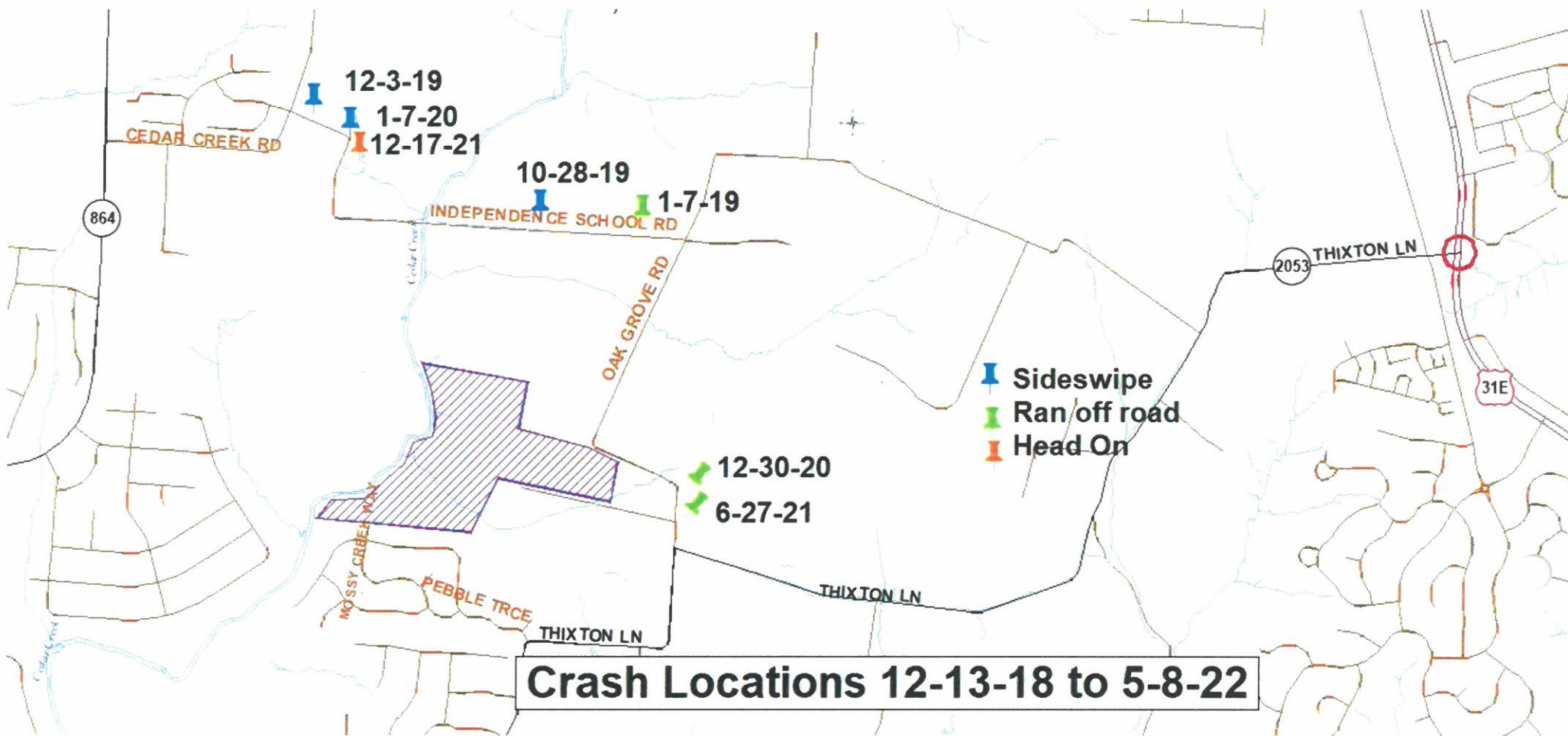


# OAK GROVE INCIDENT OVERVIEW

12 DEC 21-8 MAY 22









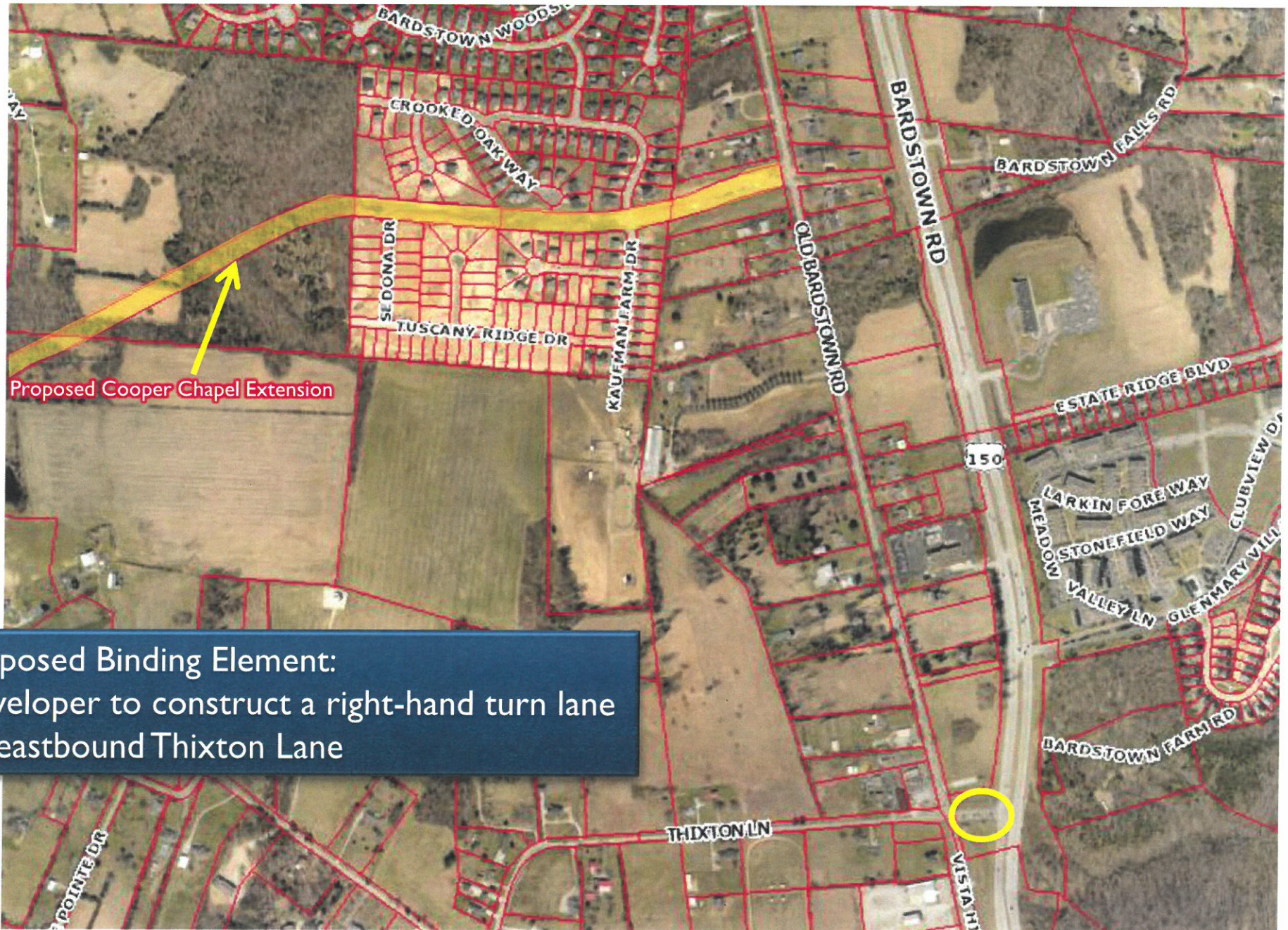
# PROPOSED ADDITIONAL BINDING ELEMENTS

- ❑ Lots 119, 120, 156, and 181 as shown on the preliminary subdivision plan shall not be further subdivided and the CCRs shall include a restriction against further subdivision of said lots may be enforced by either Louisville Metro Planning Commission or any citizens/residents of Louisville, and that the subdivision restriction could only be removed or amended, but only to be less restrictive, in whole or in part, by the Louisville Metro Planning Commission in its sole discretion.
- ❑ All property owners within 500 feet of a proposed blasting location shall be notified 30 days before any blasting operations occur and be offered pre-blast surveys. Any homeowners who opt to have a pre-blast survey conducted shall be provided copies of all materials resulting from that survey, including any photos and/or videos. Any blast survey shall be done in a manner consistent with Kentucky Blasting regulations.

## Road Improvement Binding Elements:

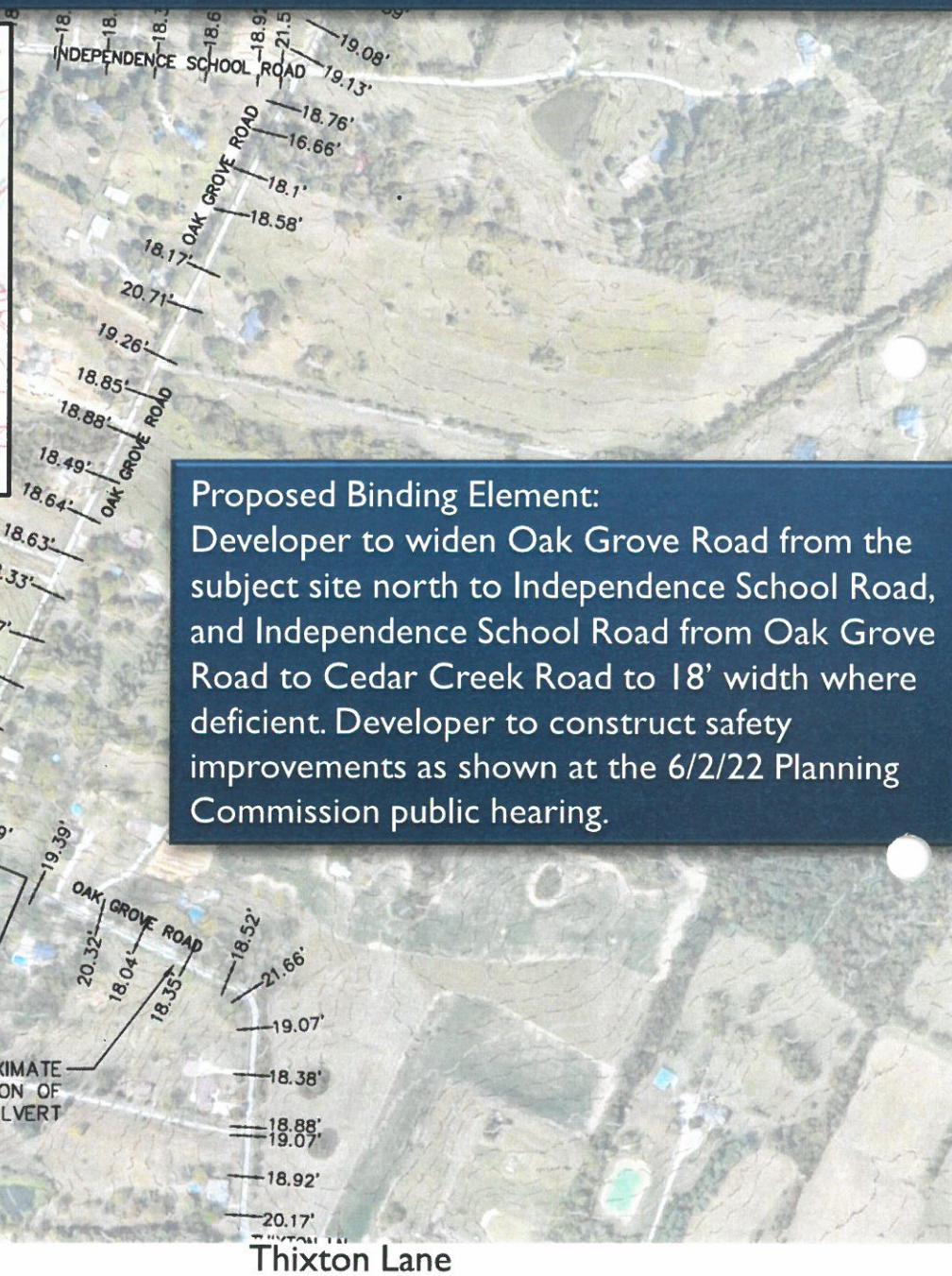
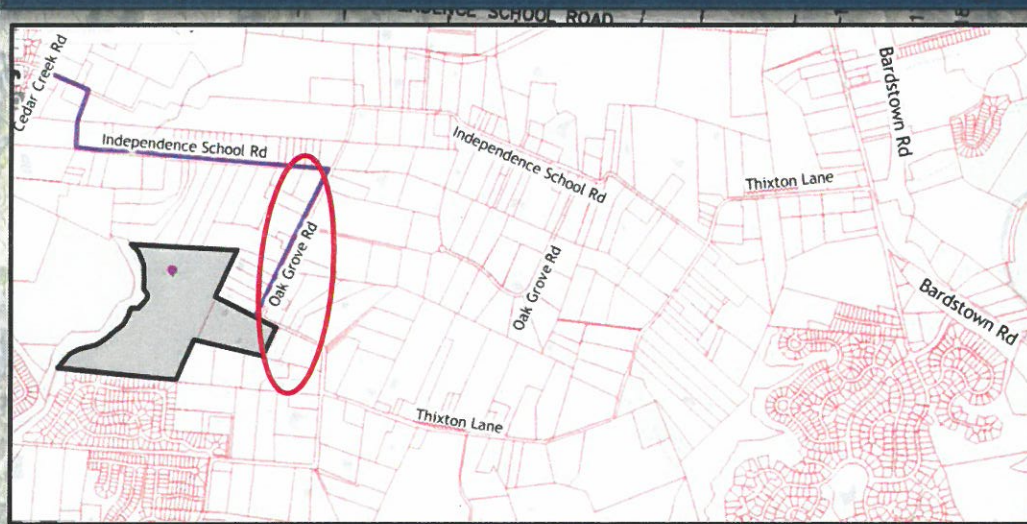
- ❑ Covenants, Conditions and Restrictions shall include a notice that the stub streets could potentially become connections.
- ❑ Developer to construct a right-hand turn lane on eastbound Thixton Lane between the west side of Old Bardstown Road to the east side of New Bardstown Road, per details from the Kentucky Transportation Cabinet.
- ❑ Developer to widen Oak Grove Road from the subject site north to Independence School Road, and Independence School Road from Oak Grove Road to Cedar Creek Road to 18' width where deficient. Developer to construct safety improvements as shown at the 6/2/22 Planning Commission public hearing.
- ❑ Developer to widen Independence School Road from Oak Grove Road to Thixton Lane, and Thixton Lane east to Bardstown Road to 18' width where deficient.







# Survey of Oak Grove Road Existing Roadway Width

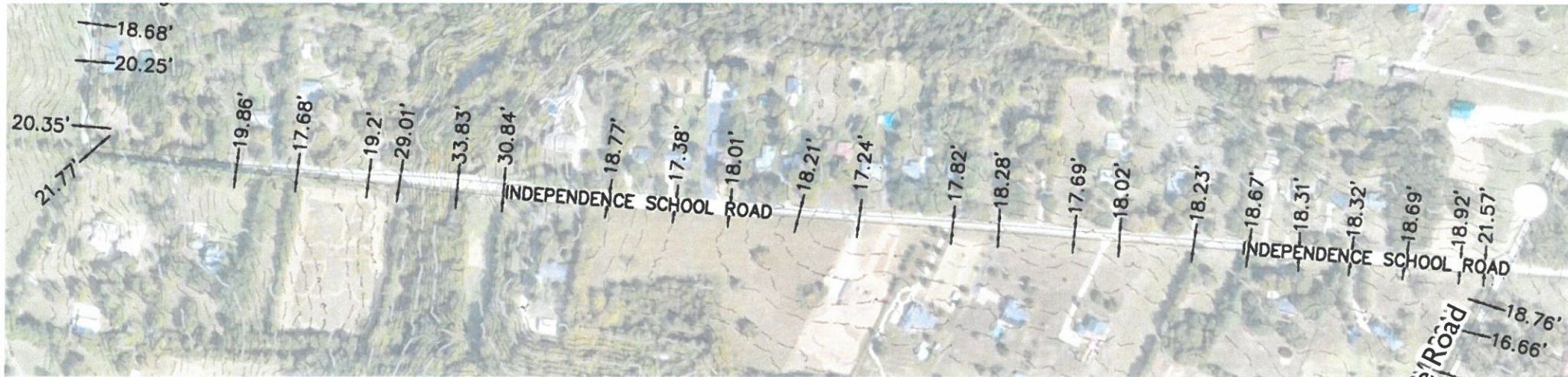
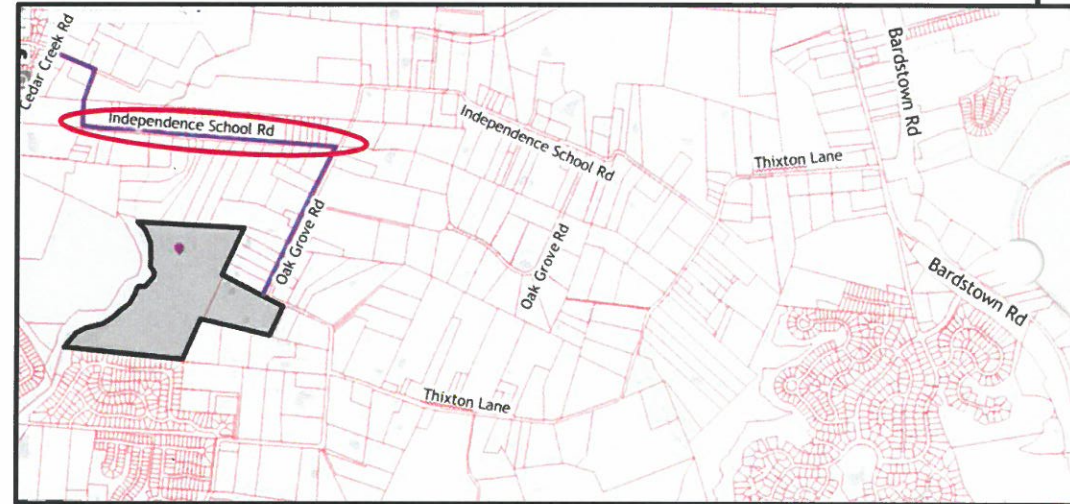


## Proposed Binding Element:

Developer to widen Oak Grove Road from the subject site north to Independence School Road, and Independence School Road from Oak Grove Road to Cedar Creek Road to 18' width where deficient. Developer to construct safety improvements as shown at the 6/2/22 Planning Commission public hearing.

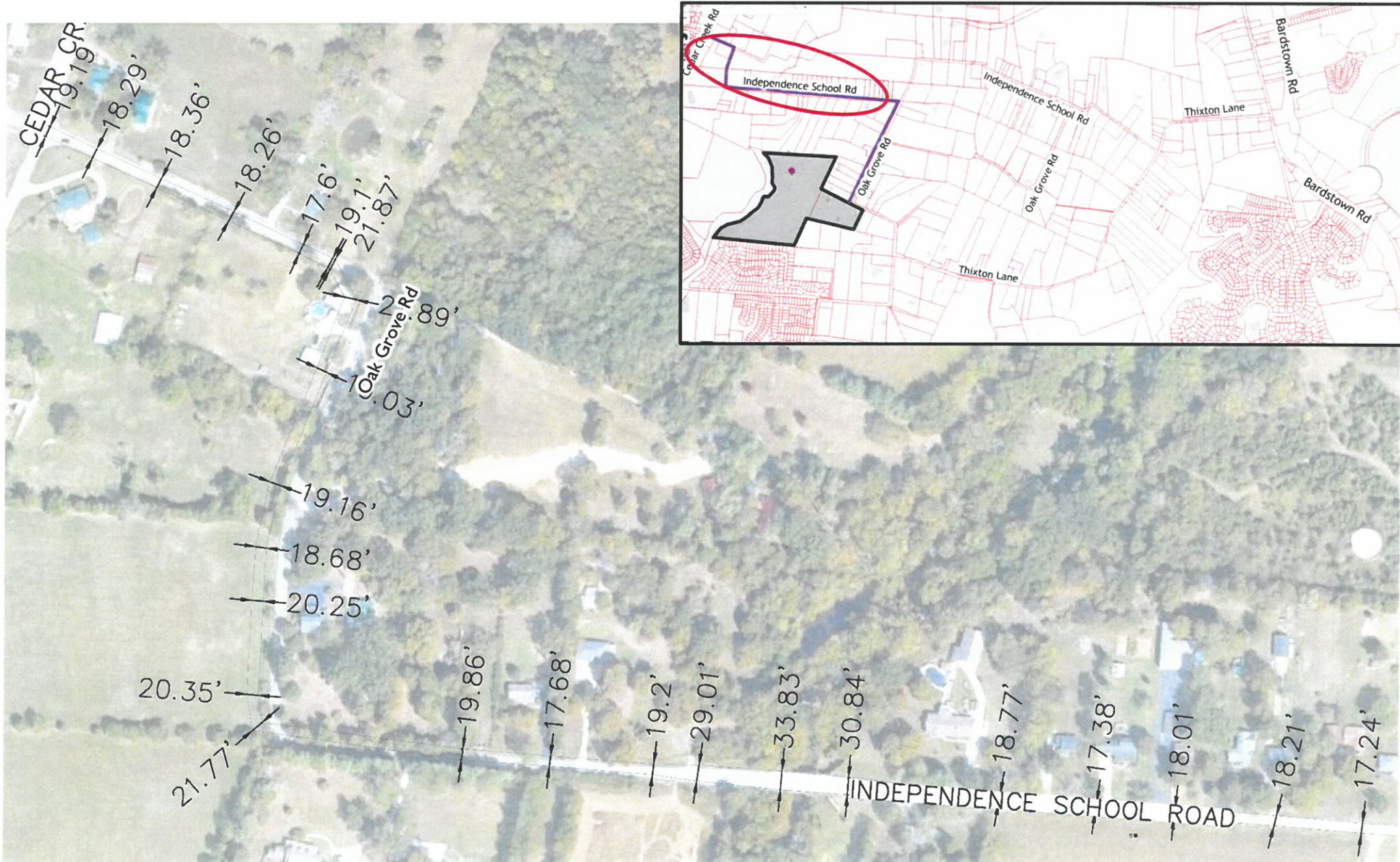


# Survey of Independence School Road existing roadway width – Developer to improve to minimum 18 ft width from Cedar Creek Road to Oak Grove Road





# Survey of Independence School Road Existing Roadway Width – Developer to improve to minimum 18 ft width



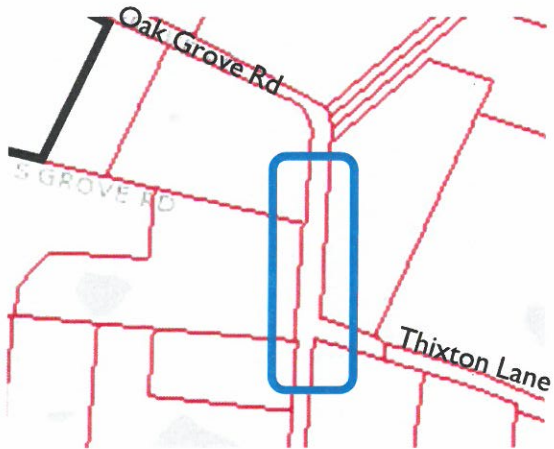


## Proposed Binding Element:

Developer to widen Oak Grove Road from the subject site north to Independence School Road, and Independence School Road from Oak Grove Road to Cedar Creek Road to 18' width where deficient. Developer to construct safety improvements as shown at the 6/22/22 Planning Commission public hearing.

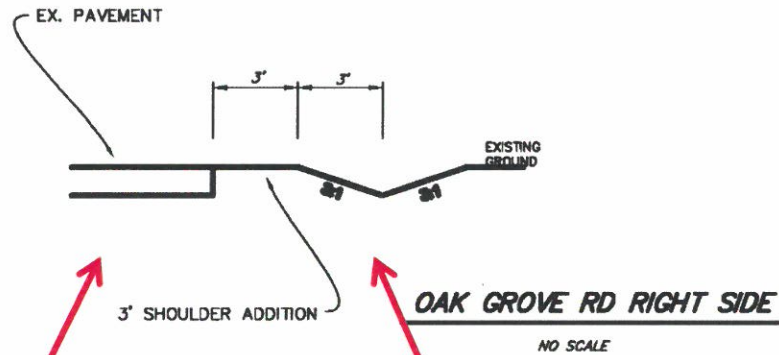




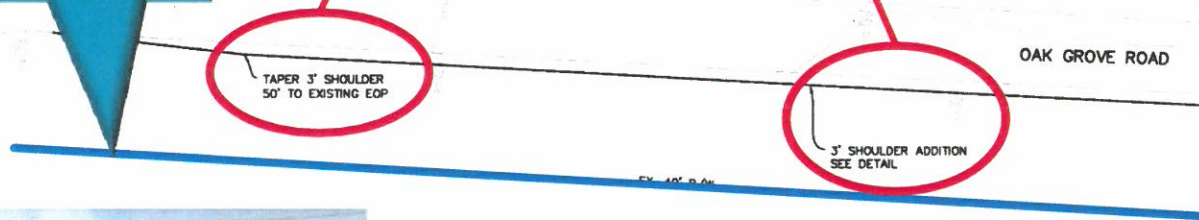


Improvements:

- 3 ft shoulder addition



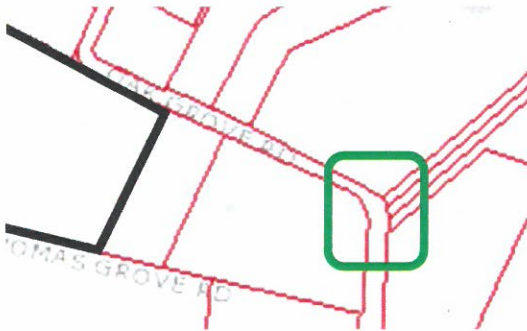
Existing 40' ROW





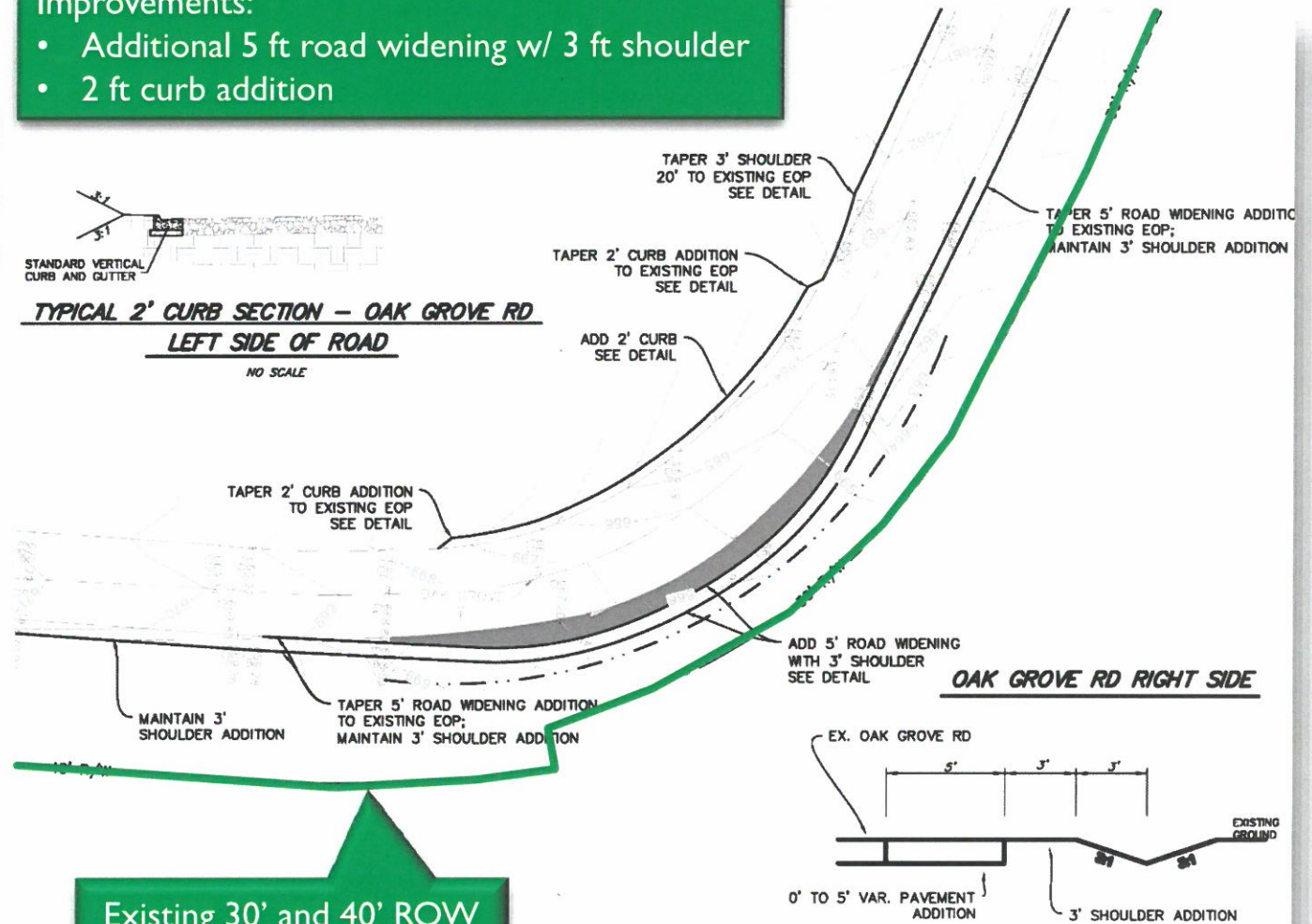
### Improvements:

- Additional 5 ft road widening w/ 3 ft shoulder
- 2 ft curb addition



### TYPICAL 2' CURB SECTION - OAK GROVE RD LEFT SIDE OF ROAD

NO SCALE



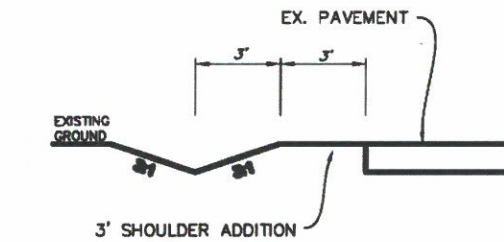
Existing 30' and 40' ROW

SECTION 2





SEE SHEET 2  
SECTION 4

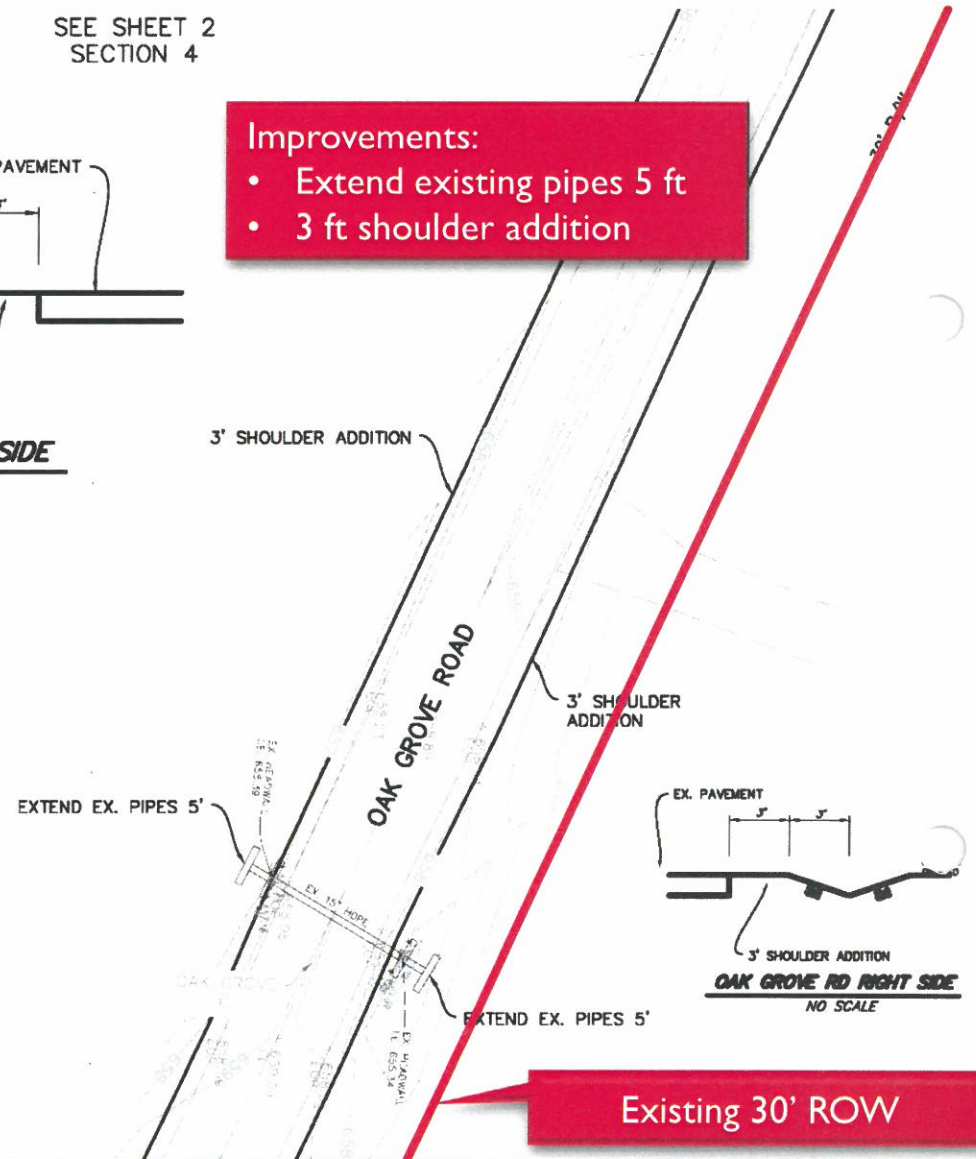


**OAK GROVE RD LEFT SIDE**  
NO SCALE

SECTION 3

Improvements:

- Extend existing pipes 5 ft
- 3 ft shoulder addition



Existing 30' ROW

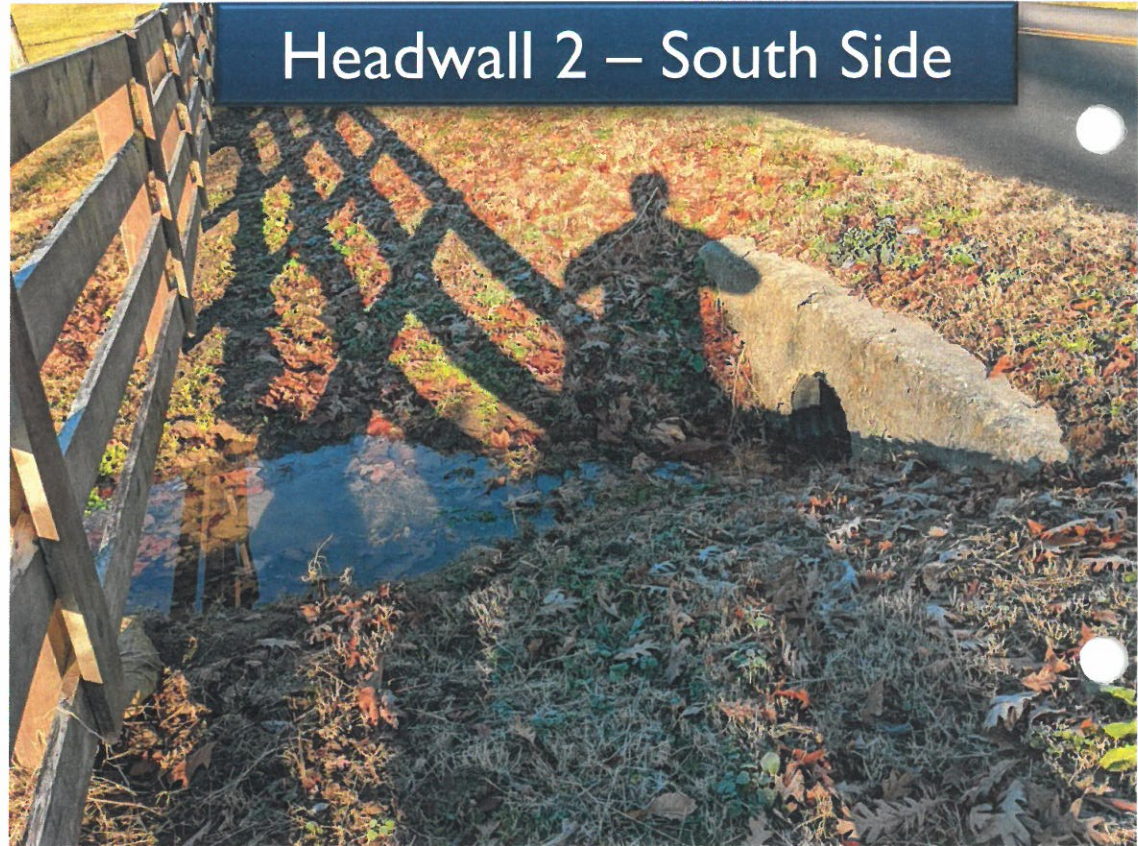


Headwall 2 – North Side

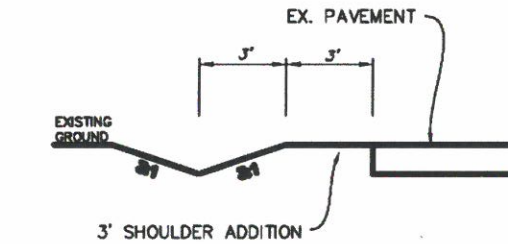
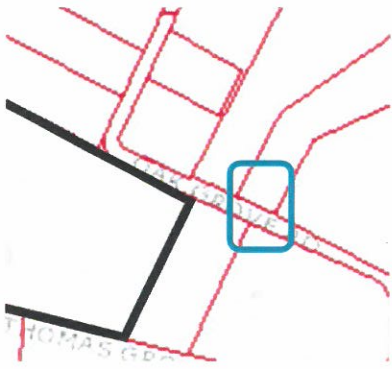


Extend existing pipes 5 ft

Headwall 2 – South Side







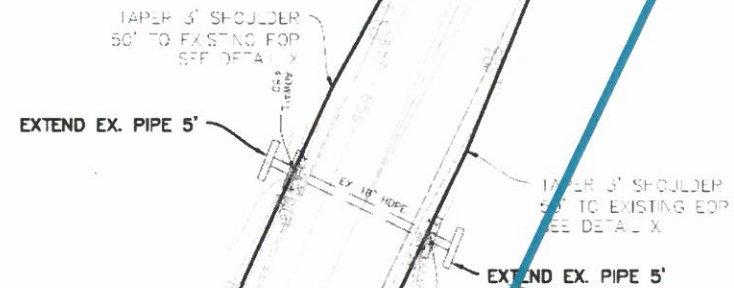
#### OAK GROVE RD LEFT SIDE

NO SCALE

#### SECTION 4

#### Improvements:

- Extend existing pipes 5 ft
- 3 ft shoulder addition



Existing 30' ROW

SEE SHEET 1  
SECTION 3

SEE SHEET 1  
SECTION 3

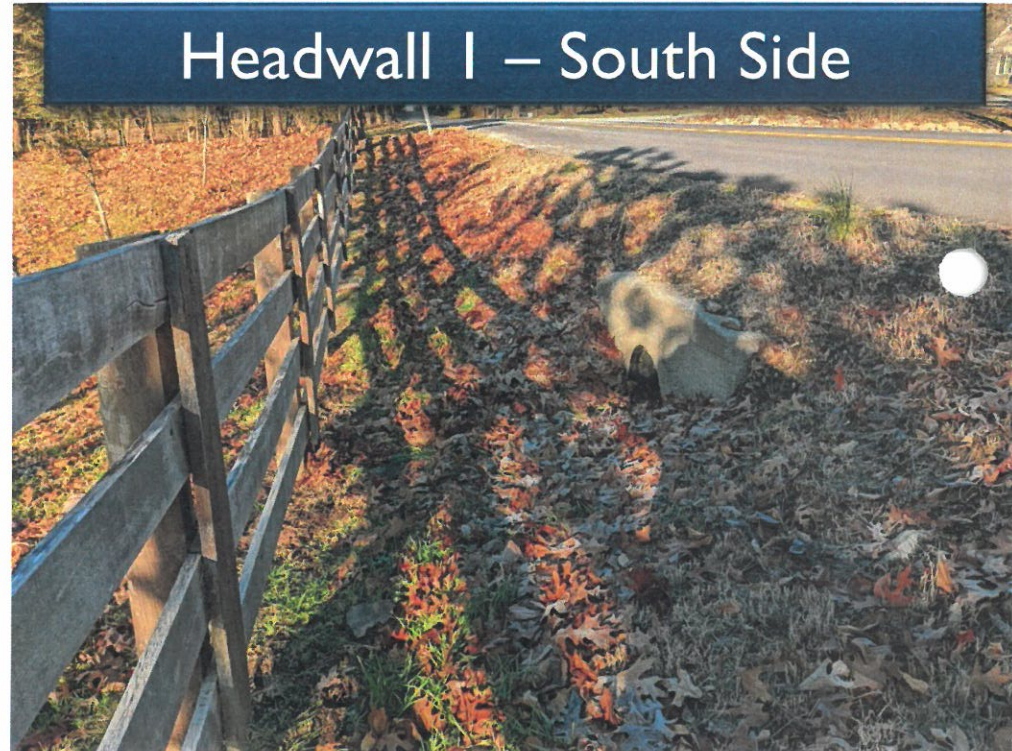


## Headwall I – North Side



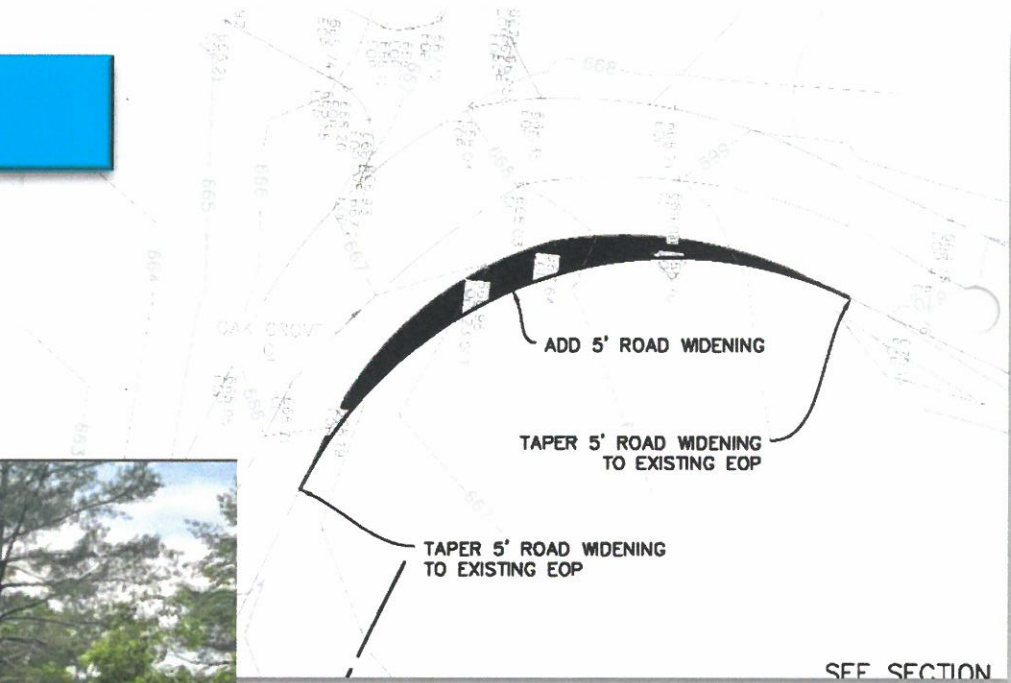
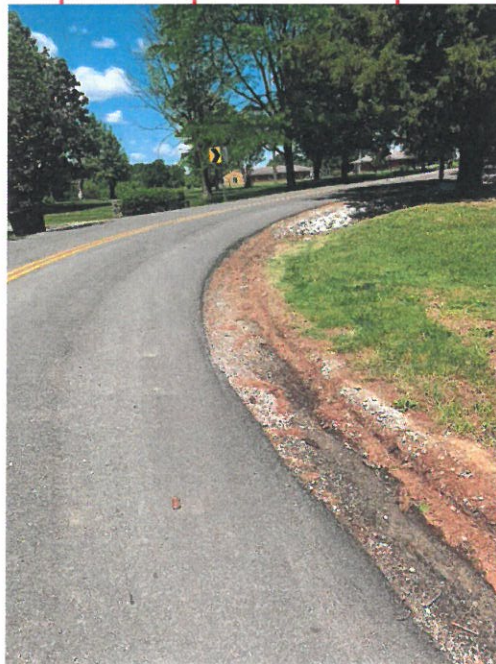
Extend existing pipes 5 ft

## Headwall I – South Side

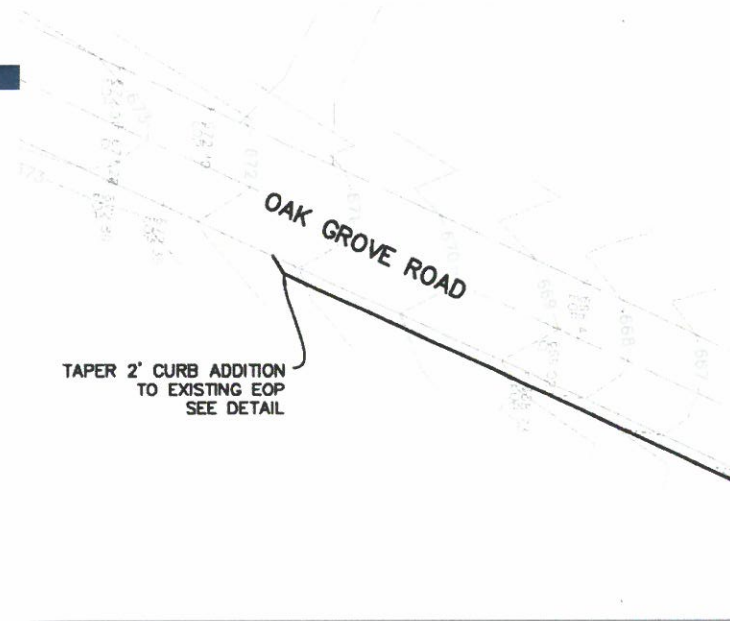
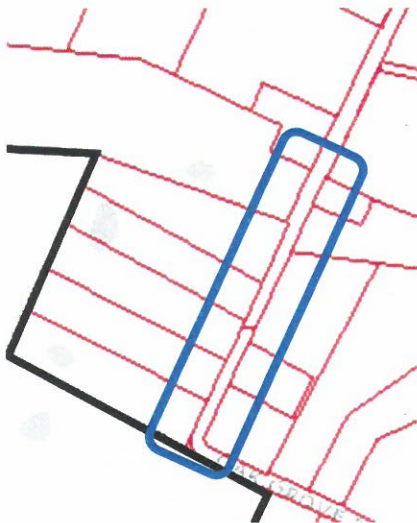




- Improvements:
- 5 ft road widening

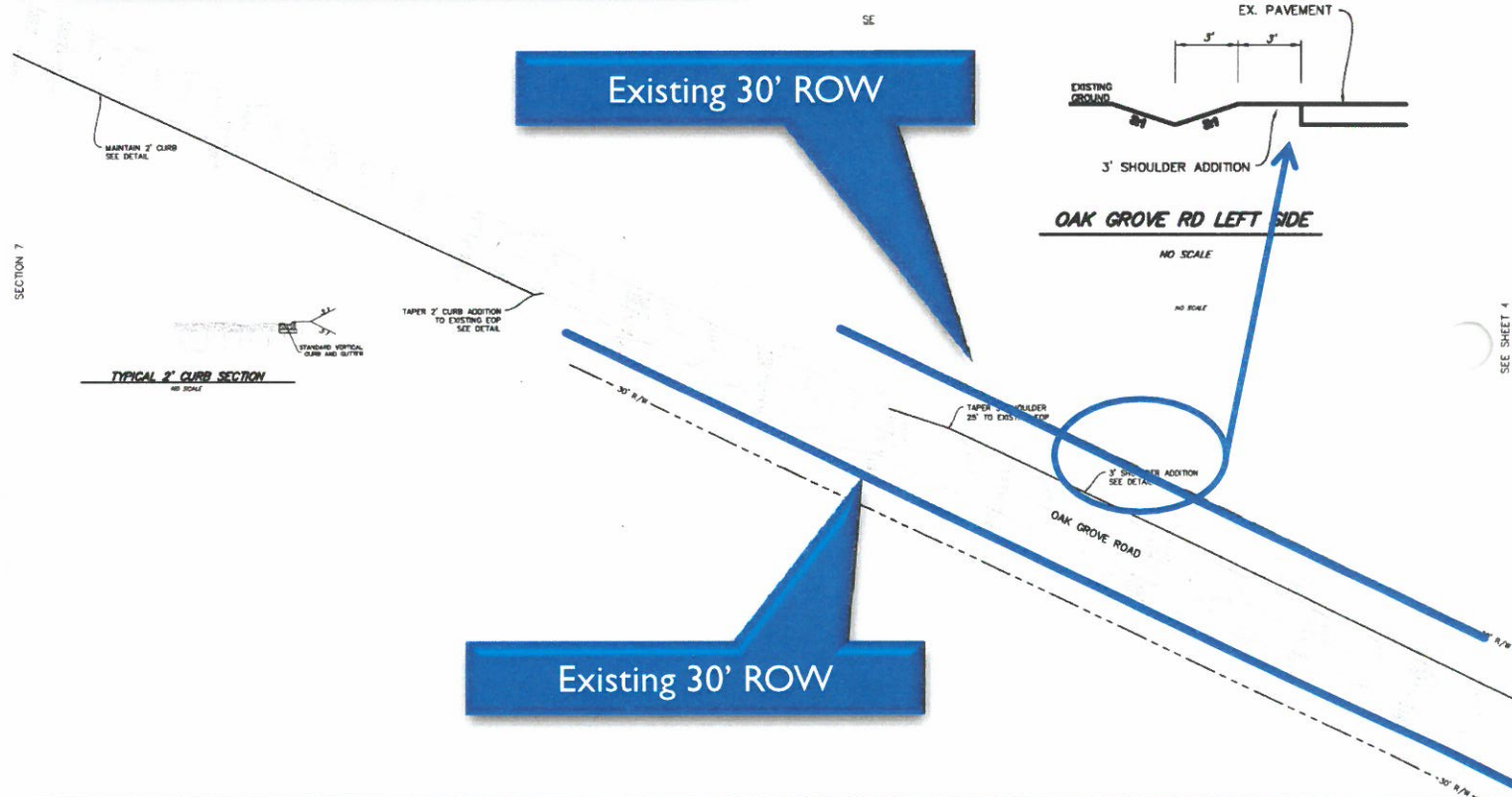






### Improvements:

- 2 ft curb addition
- 3 ft shoulder addition

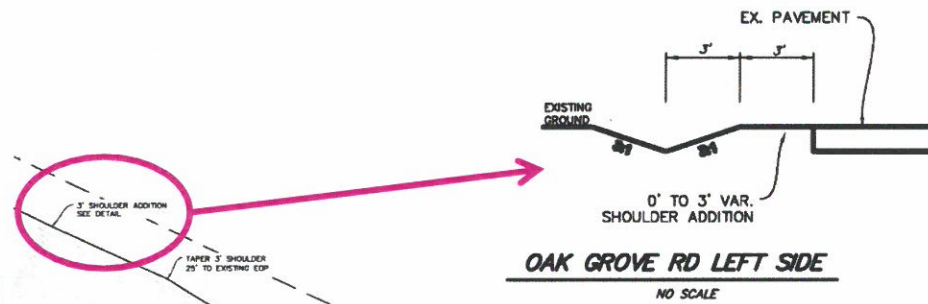






Current view of Oak Grove Road





Improvements:

- 3 ft shoulder addition

SECTION B

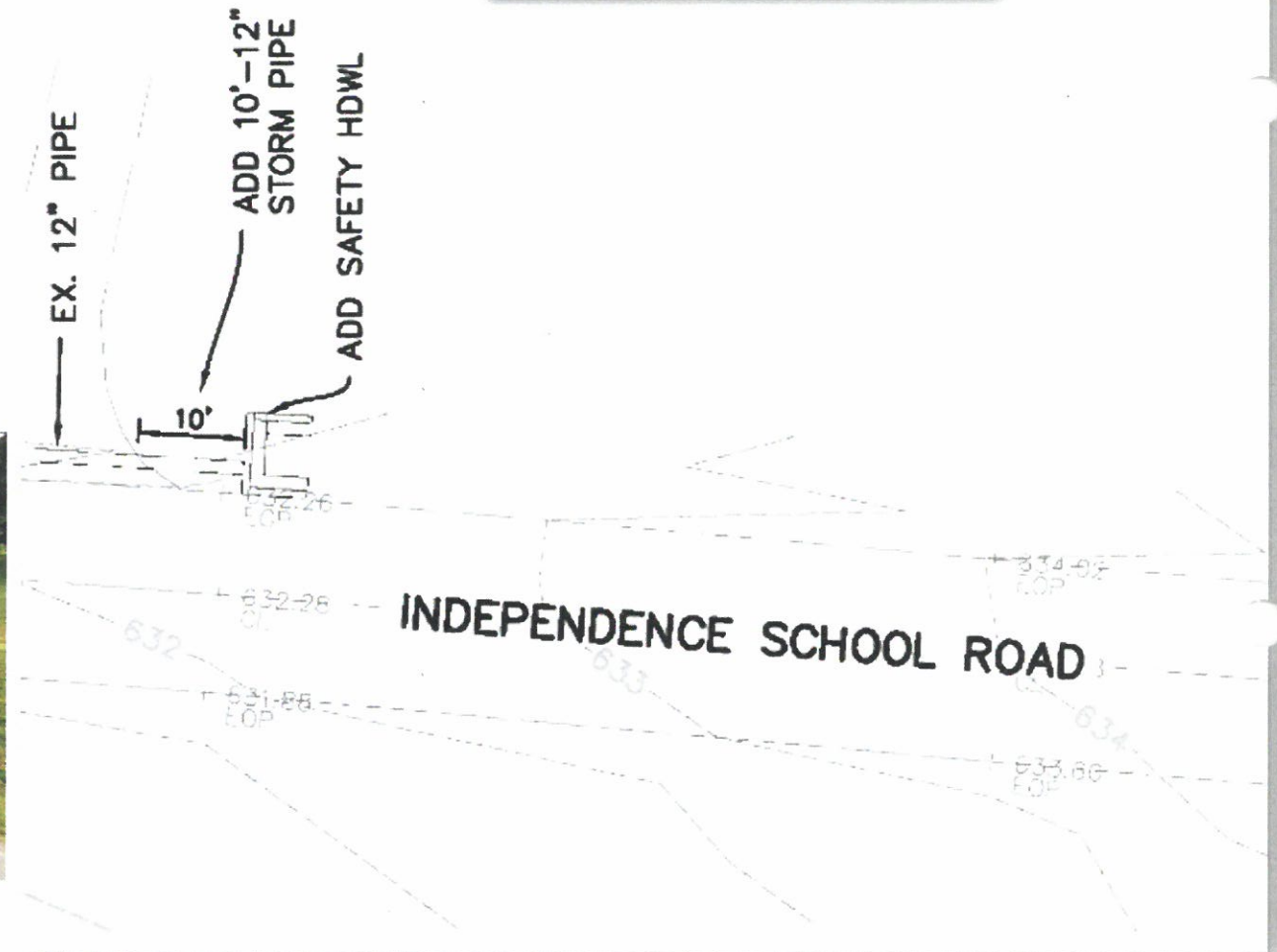
OAK GROVE ROAD



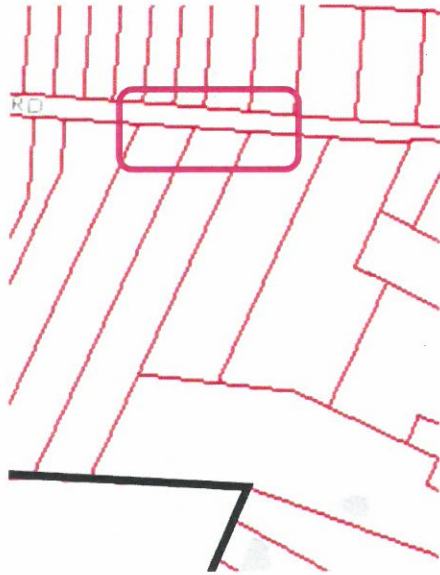


#### Improvements:

- Add safety headwall
- Add storm pipe



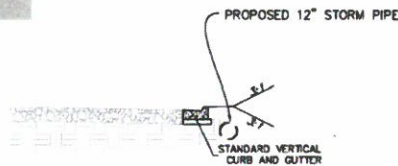
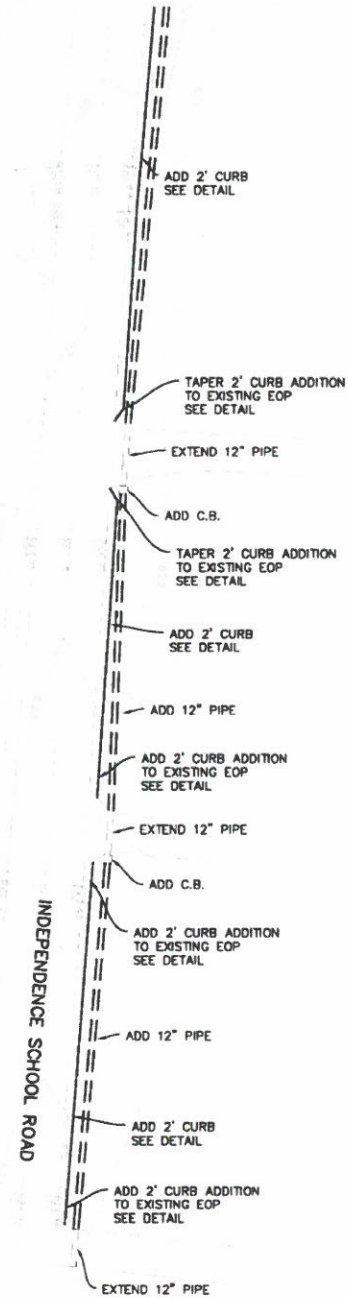




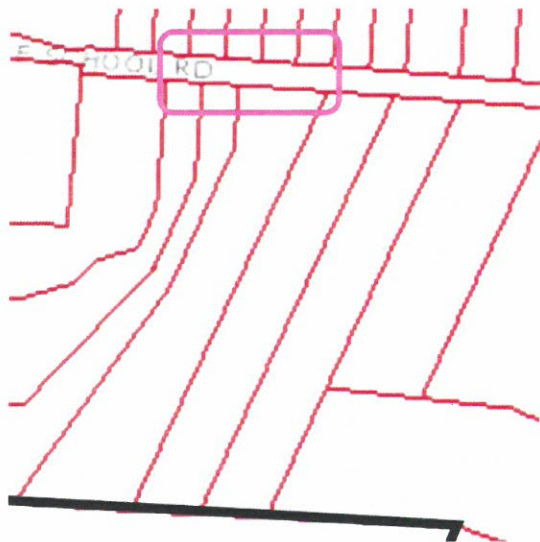
- Improvements:
- Add 2 ft curb
  - Extend pipe



SECTION 13

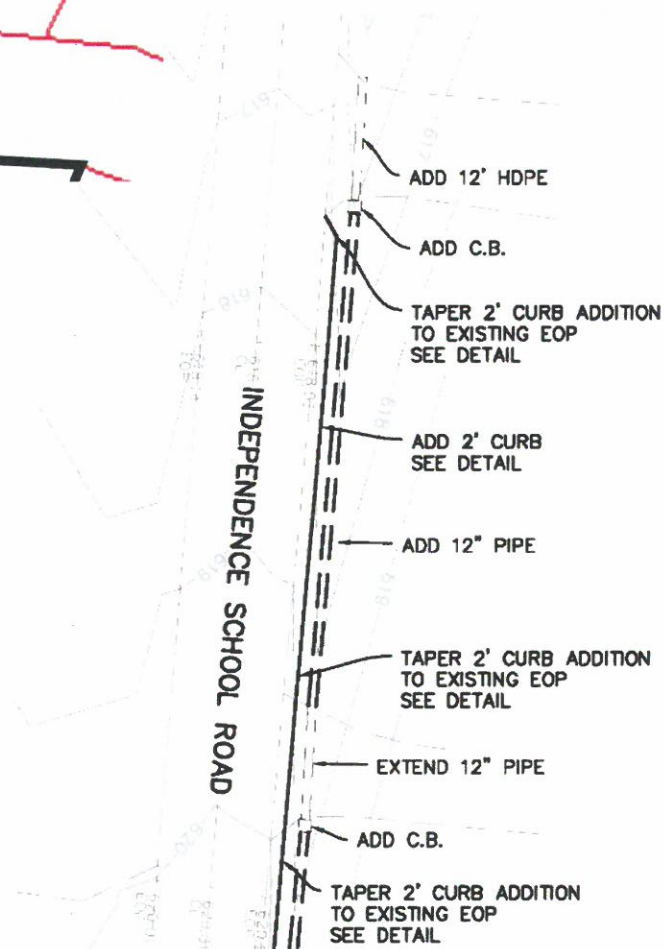






### Improvements:

- Add 2 ft curb
- Extend pipe



### TYPICAL 2' CURB SECTION

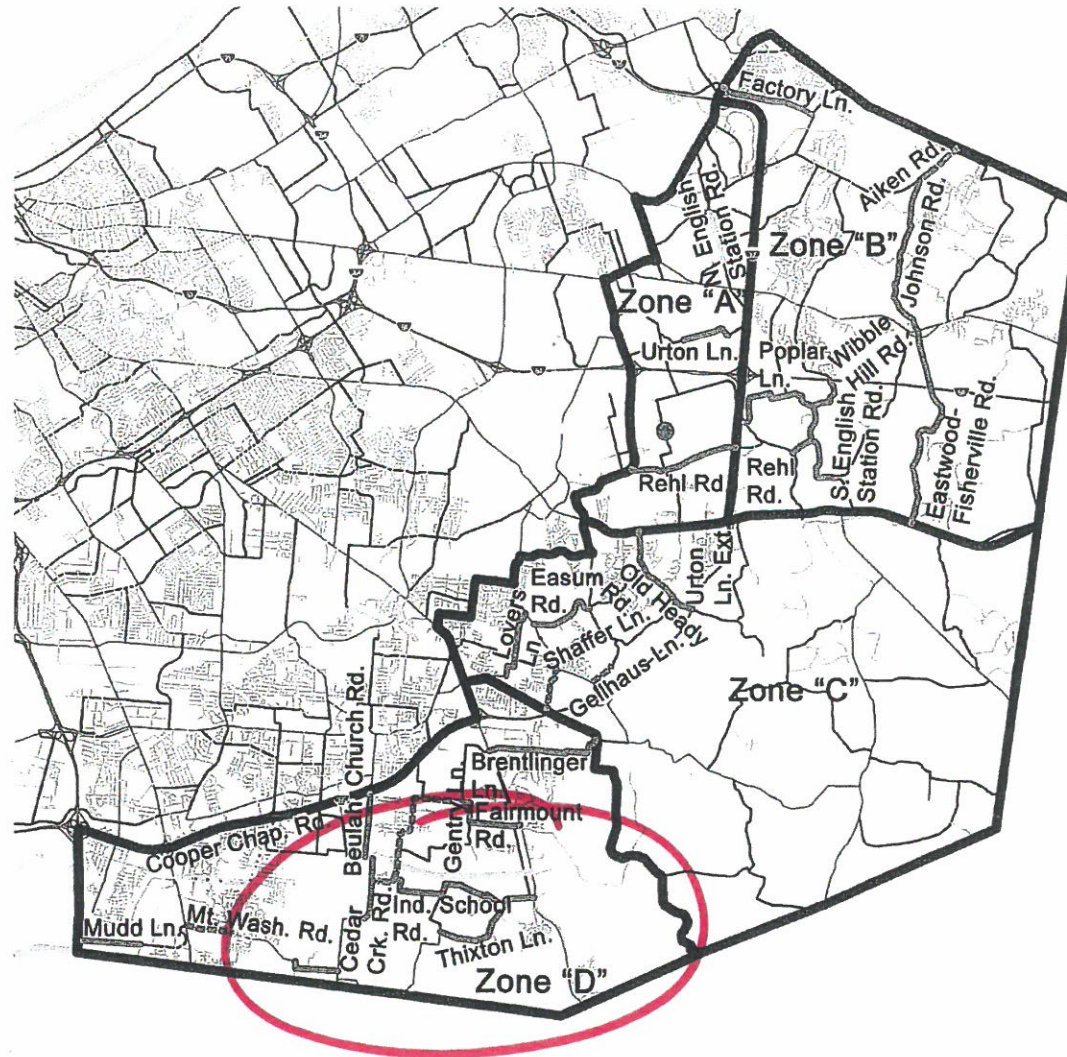
NO SCALE

SEE SHEET 6  
SECTION 13





## DESIGNATED ROADS



Copyright (c) 2004, LOUISVILLE AND JEFFERSON  
COUNTY METROPOLITAN SEWER DISTRICT (MSD),  
LOUISVILLE WATER COMPANY (LWC) and  
LOUISVILLE METRO GOVERNMENT  
All Rights Reserved





System Development Designated Roads  
Status as of December 31, 2019

|                                                      | Miles       | Status                            |
|------------------------------------------------------|-------------|-----------------------------------|
| <b>Zone A</b>                                        |             |                                   |
| Rehl Road - Blankenbaker Pkwy to I-265               | 1.3         | Not Started                       |
| Tucker Station Road - Bridge Replacement             |             | Complete                          |
| Urton Lane ( N Pope Lick Rd. To Urton Lane Extension | <u>0.85</u> | Complete                          |
|                                                      | 2.15        |                                   |
| <b>Designated Corridor Project</b>                   |             |                                   |
| North English Station Road Aiken Rd. to Old Henry    | 0.85        | Pending - to be completed by KYTC |
| 80/20 Local Match                                    | <u>0.85</u> |                                   |
|                                                      | 3           |                                   |
| <b>Zone Percentage by Milage</b>                     | 7.02%       |                                   |

|                                                           |
|-----------------------------------------------------------|
| <b>Zone B</b>                                             |
| Aiken Road (Johnson Road to Co. Line)                     |
| Eastwood-Fisherville Road (US 60 to Taylorsville Road)    |
| Eastwood-Fisherville Road (Railroad Underpass)            |
| Factory Lane (LaGrange Rd. to Old Henry Rd.)              |
| Johnson Road (Shelbyville Rd. to Aiken Rd.)               |
| Poplar Lane (S. Pope Lick Rd. to S. English Station Rd.)  |
| Rehl Road (S. Pope Lick Rd. to S. English Station Rd.)    |
| South English Station Road (Poplar Lane to Echo Hill Rd.) |
| Wibble Hill Road (S. English Station Rd. to I64)          |

Beckley Station Road - Added by Committee  
Aiken & Bush Farm Rd Intersection - Added by Committee  
N English Station Rd Intersection- Added by Committee

|                                                         |
|---------------------------------------------------------|
| <b>Zone C</b>                                           |
| Easum Road (Billtown Rd. to Cheoweth Run Rd.)           |
| Gelhaus Lane (Bus Compound Improvements)                |
| Lovers Lane (Seatonville Rd. to Billtown Rd.)           |
| Old Heady Road (I-265 to Taylorsville Rd.)              |
| Shaffer Lane (Seatonville Rd. to Billtown Rd.)          |
| Urton lane Ext.: Lovers Lane to Billtown Road (Rt. 100) |
| Urton lane Ext.: Old Heady Rd. to Taylorsville Rd.      |

**Zone D**

|                                                           |             |             |
|-----------------------------------------------------------|-------------|-------------|
| Beulah Church Road (I-265 to Heritage Creek)              | 2           | Complete    |
| Brentlinger Lane (Bardstown Rd. to Seatonville Rd.)       | 1.9         | Complete    |
| Fairmount Road (Bardstown Rd. to Seatonville Rd.)         | 0.71        | Complete    |
| Gentry Lane (Fairmount Rd. to Cedar Creek Rd.)            | 0.46        | Complete    |
| Independence School Road (Cedar Creek Rd. to Thixton Ln.) | 2.23        | Complete    |
| Mt. Washington Road (90 degree bend to Cedar Creek Rd)    | 0.01        | Complete    |
| Mt. Washington Road (Preston Hwy to Waycross Dr)          | 0.79        | Complete    |
| Mudd Lane (Blue Lick Rd. to Cody Lane)                    | 1           | Not Started |
| Thixton Lane (Bardstown Road to Oak Grove Road)           | 1.88        | Complete    |
| Cedar Creek Rd (Beulah Church Rd to Gentry Ln)            | <u>2.61</u> | Complete    |

13.59

|                                                           |
|-----------------------------------------------------------|
| <b>Zone D</b>                                             |
| Beulah Church Road (I-265 to Heritage Creek)              |
| Brentlinger Lane (Bardstown Rd. to Seatonville Rd.)       |
| Fairmount Road (Bardstown Rd. to Seatonville Rd.)         |
| Gentry Lane (Fairmount Rd. to Cedar Creek Rd.)            |
| Independence School Road (Cedar Creek Rd. to Thixton Ln.) |
| Mt. Washington Road (90 degree bend to Cedar Creek Rd)    |
| Mt. Washington Road (Preston Hwy to Waycross Dr)          |
| Mudd Lane (Blue Lick Rd. to Cody Lane)                    |
| Thixton Lane (Bardstown Road to Oak Grove Road)           |
| Cedar Creek Rd (Beulah Church Rd to Gentry Ln)            |

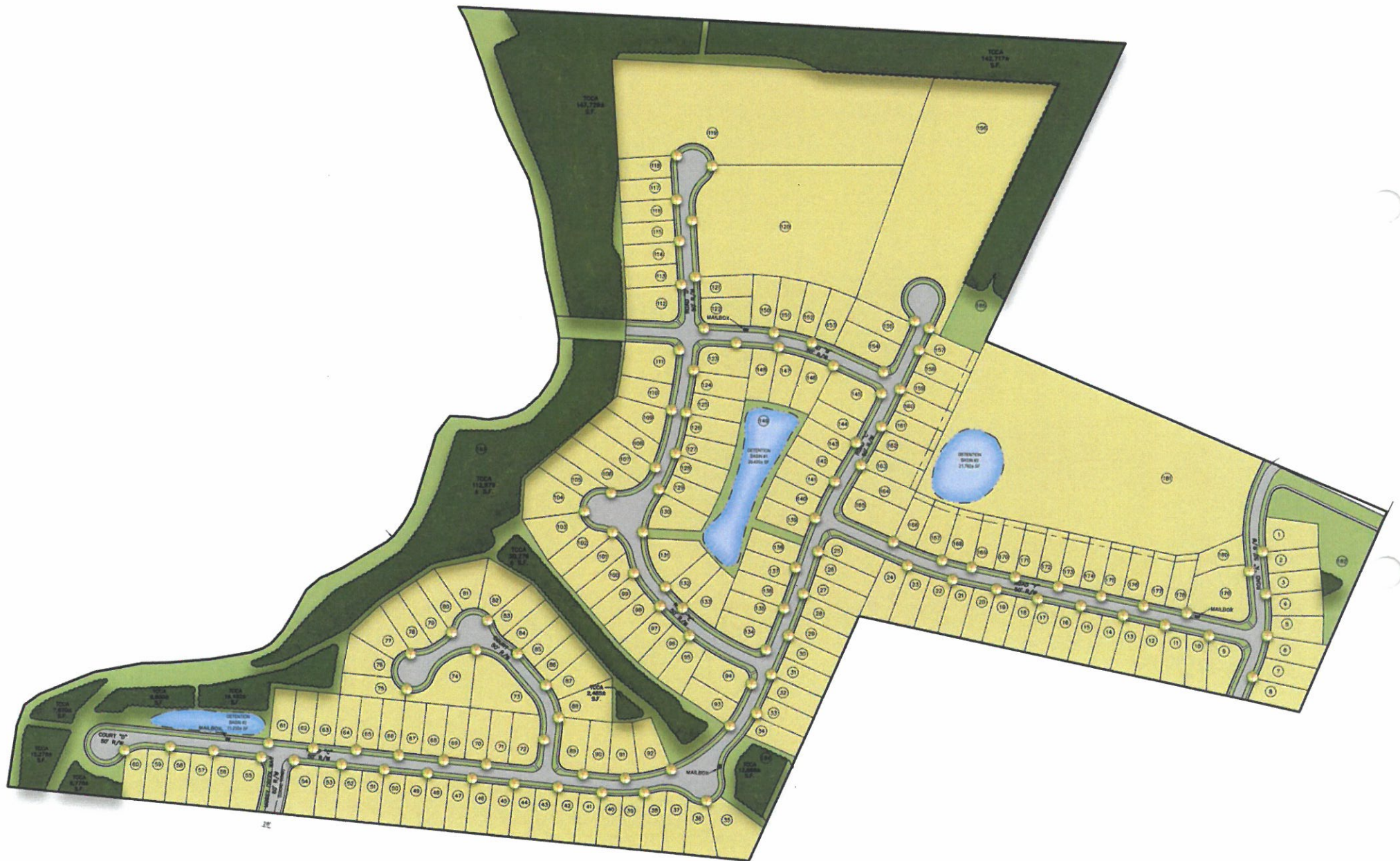
|                                                             |
|-------------------------------------------------------------|
| <b>Designated Corridor Project</b>                          |
| Cooper Chapel Road Phase 1 - Preston Hwy to Smyrna Rd.      |
| 80/20 Local Match                                           |
| Cooper Chapel Road Phase 3 - Beulah Church to Old Bardstown |
| 80/20 Local Match                                           |

|                                  |              |
|----------------------------------|--------------|
| <b>Zone Percentage by Milage</b> | 42.23%       |
| <b>Total Miles</b>               | <u>42.72</u> |

Funds encumbered from bond issued to support system development projects: \$320,407  
Funds remaining from bond issued to support system development projects: \$1,801,098



# Proposed subdivision plan

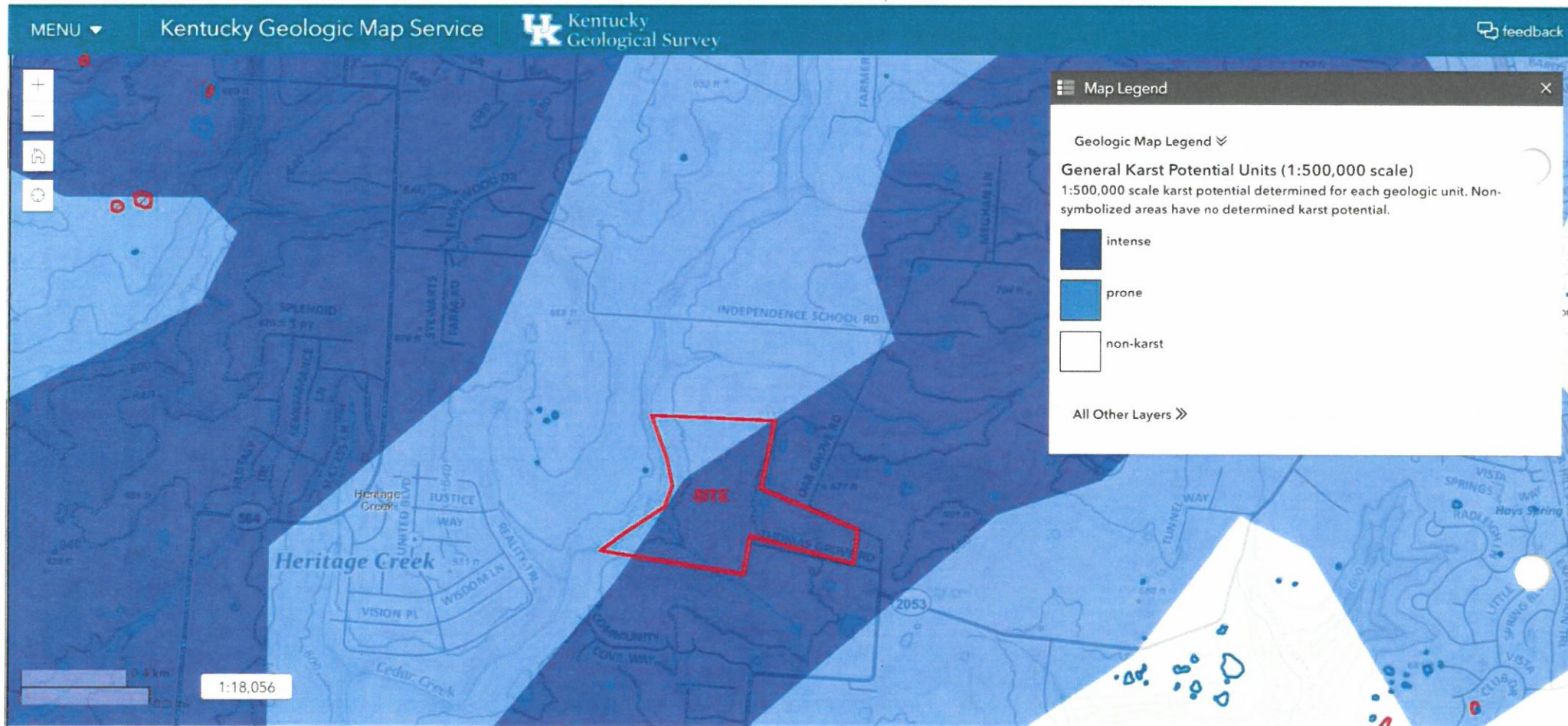








# Karst Potential Map





# Karst Survey – Sinkhole location map

○ = SINKHOLE

Cedar Creek

SITE

Oak Grove Church



|                           |                         |           |
|---------------------------|-------------------------|-----------|
| 1. FOR REVIEW & COMMENT   | 7. REVIEW & RECOMMEND   | 15. _____ |
| 4. FOR APPROPRIATE ACTION | 10. REJECTED            | 16. _____ |
| 5. FOR SIGNATURE & RETURN | 11. NO EXCEPTIONS TAKEN | 17. _____ |
| 6. AS REQUESTED           | 12. NOTE MARKINGS       | 18. _____ |

REMARKS: Mindel Scott professional engineer, Travis Brown, conducted online research to assess karst potential at the project site. The Kentucky Geologic Map service online characterizes the site as being karst prone to intense karst potential, with no mapped sinkholes on the site but many in the project vicinity.

The engineer visited the site on September 1, 2021 to perform a visual inspection and site walk. Upon walking the site the engineer encountered numerous sinkholes and other potentially karstic features on the site. Their approximate locations are noted on the attached location map. It should be noted that much of the ground was invisible or inaccessible at the time of inspection due to dense vegetation. It is likely to encounter these sinkholes other features during earthwork for the proposed construction. It is recommended to retain geotechnical services during construction to call if sinkholes are encountered. Care should be taken during earthwork to investigate and properly remediate potential sinkholes, per the geotechnical engineer's recommendations. It will be important to proofroll thoroughly before placing fill and after cutting.

COPIES TO: \_\_\_\_\_

SENT BY: Thank you,  
Travis A. Brown, PE

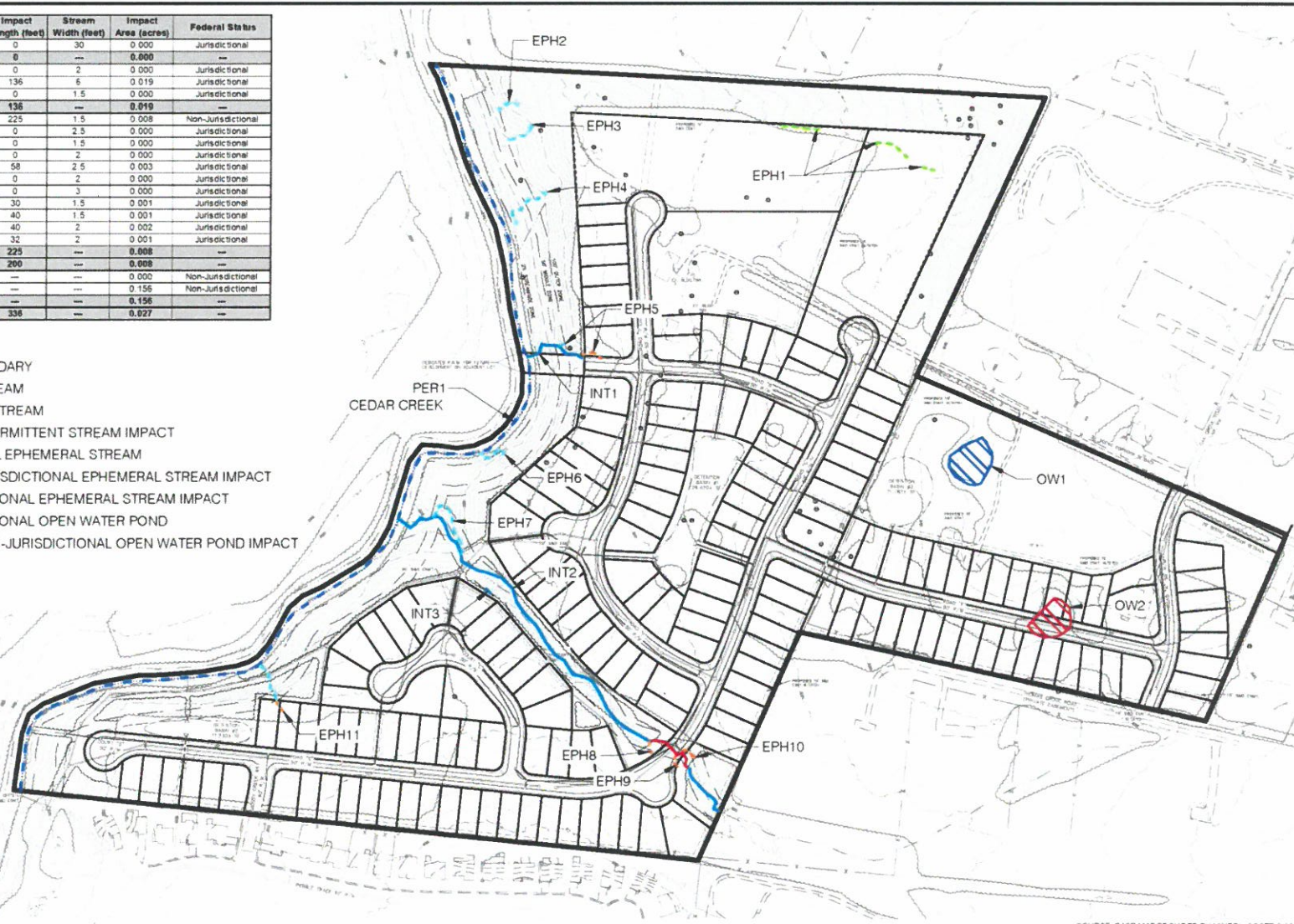


R:\Engineering\Projects\103974\_Oak\_Grove\_Road\CAD\103974-Basemap\_SitePlan\_Eric Bowman\_5/25/2022 9:02 AM

| Feature                                   | Impact Length (feet) | Stream Width (feet) | Impact Area (acres) | Federal Status     |
|-------------------------------------------|----------------------|---------------------|---------------------|--------------------|
| Cedar Creek                               | 0                    | 30                  | 0.000               | Jurisdictional     |
| Perennial Stream Total                    | 0                    | ---                 | 0.000               | ---                |
| Intermittent Stream 1                     | 0                    | 2                   | 0.000               | Jurisdictional     |
| Intermittent Stream 2                     | 136                  | 6                   | 0.019               | Jurisdictional     |
| Intermittent Stream 3                     | 0                    | 1.5                 | 0.000               | Jurisdictional     |
| Intermittent Stream Total                 | 136                  | ---                 | 0.019               | ---                |
| Ephemeral Stream 1                        | 225                  | 1.5                 | 0.008               | Non-Jurisdictional |
| Ephemeral Stream 2                        | 0                    | 2.5                 | 0.000               | Jurisdictional     |
| Ephemeral Stream 3                        | 0                    | 1.5                 | 0.000               | Jurisdictional     |
| Ephemeral Stream 4                        | 0                    | 2                   | 0.000               | Jurisdictional     |
| Ephemeral Stream 5                        | 58                   | 2.5                 | 0.003               | Jurisdictional     |
| Ephemeral Stream 6                        | 0                    | 2                   | 0.000               | Jurisdictional     |
| Ephemeral Stream 7                        | 0                    | 3                   | 0.000               | Jurisdictional     |
| Ephemeral Stream 8                        | 30                   | 1.5                 | 0.001               | Jurisdictional     |
| Ephemeral Stream 9                        | 40                   | 1.5                 | 0.001               | Jurisdictional     |
| Ephemeral Stream 10                       | 40                   | 2                   | 0.002               | Jurisdictional     |
| Ephemeral Stream 11                       | 32                   | 2                   | 0.001               | Jurisdictional     |
| Non-Jurisdictional Ephemeral Stream Total | 225                  | ---                 | 0.008               | ---                |
| Jurisdictional Ephemeral Stream Total     | 200                  | ---                 | 0.008               | ---                |
| Open Water Pond 1                         | ---                  | ---                 | 0.000               | Non-Jurisdictional |
| Open Water Pond 2                         | ---                  | ---                 | 0.156               | Non-Jurisdictional |
| Open Water Pond Total                     | ---                  | ---                 | 0.156               | ---                |
| Jurisdictional Features Total             | 336                  | ---                 | 0.027               | ---                |

#### LEGEND

- PROJECT BOUNDARY
- PERENNIAL STREAM
- INTERMITTENT STREAM
- PROPOSED INTERMITTENT STREAM IMPACT
- JURISDICTIONAL EPHEMERAL STREAM
- PROPOSED JURISDICTIONAL EPHEMERAL STREAM IMPACT
- NON-JURISDICTIONAL EPHEMERAL STREAM IMPACT
- NON-JURISDICTIONAL OPEN WATER POND
- PROPOSED NON-JURISDICTIONAL OPEN WATER POND IMPACT



NOTE: JURISDICTIONAL WATERWETLAND BOUNDARIES WERE DELINEATED AND SURVEYED USING GLOBAL POSITIONING SYSTEM EQUIPMENT BY DES WETLAND SCIENTISTS ON APRIL 27, 2021. THESE BOUNDARIES HAVE NOT BEEN VERIFIED BY THE U.S. ARMY CORPS OF ENGINEERS. USE OF THIS MAP IS FOR PRELIMINARY PLANNING PURPOSES ONLY.



OAK GROVE ROAD PROPERTY  
JEFFERSON COUNTY, KENTUCKY

REVISED DATE: 10-25-22

DRAWN BY: EOB

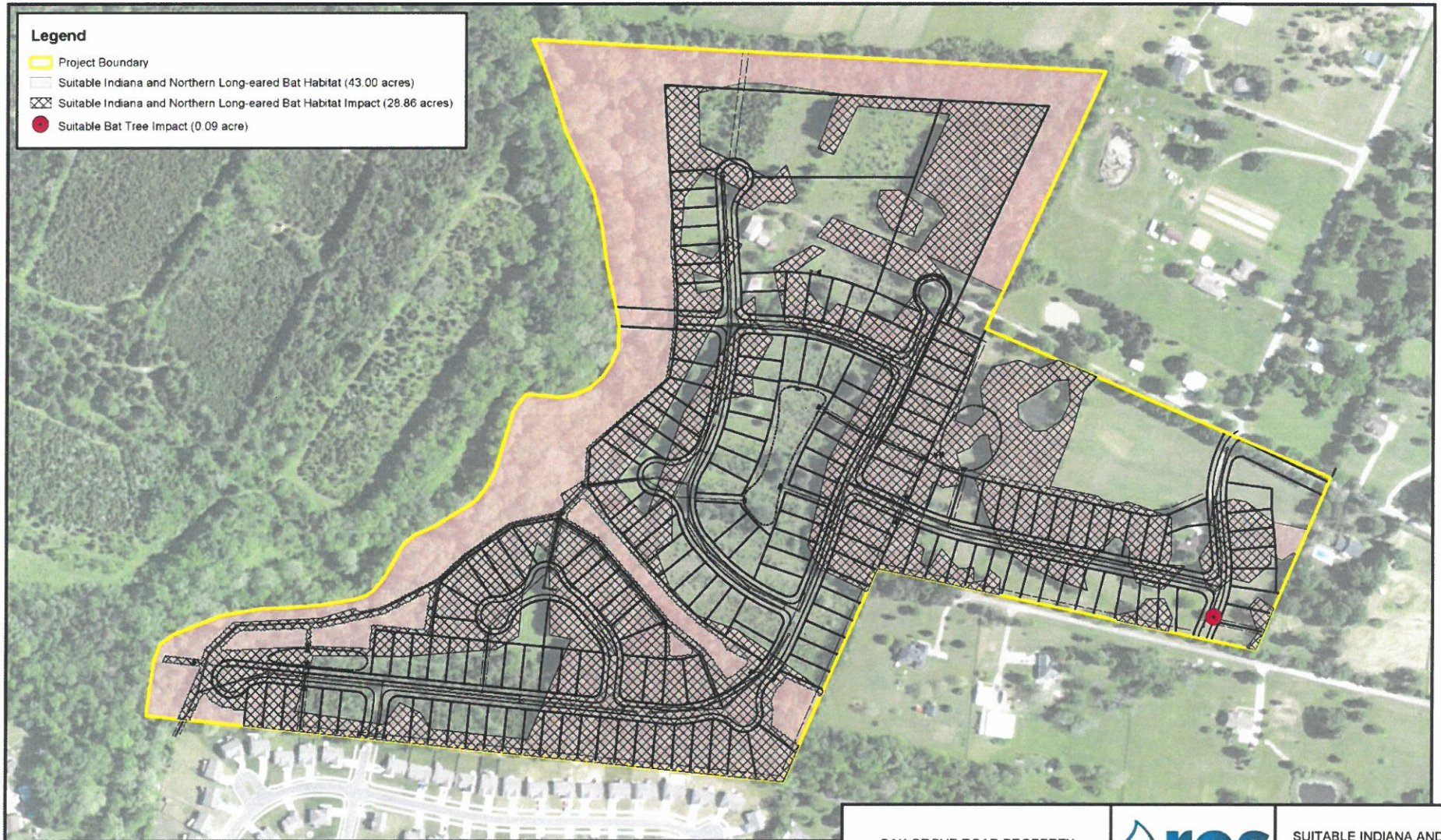


SITE DEVELOPMENT  
PLAN

FIGURE 4



Source: Aerial - (NAIP-FSA) from kygisserver.ky.gov ArcGIS services (2018). Basemap provided by Mindel, Scott & Associates, Inc.



**Legend**

- Project Boundary
- Suitable Indiana and Northern Long-eared Bat Habitat (43.00 acres)
- Suitable Indiana and Northern Long-eared Bat Habitat Impact (28.86 acres)
- Suitable Bat Tree Impact (0.09 acre)

0 125 250 500 750 1,000 Feet

NOTE: HABITAT ASSESSMENT PERFORMED BY  
RES BIOLOGISTS ON APRIL 27, 2021



OAK GROVE ROAD PROPERTY  
JEFFERSON COUNTY, KENTUCKY



SUITABLE INDIANA AND  
NORTHERN LONG-EARED  
BAT HABITAT IMPACT MAP

REVISED DATE 05-25-22 | DRAWN BY: EDB/KJI

FIGURE 8



Source: Aerial - (NAIP-FSA) from kygisserver.ky.gov ArcGIS services (2018). Basemap provided by Mindel, Scott & Associates, Inc.

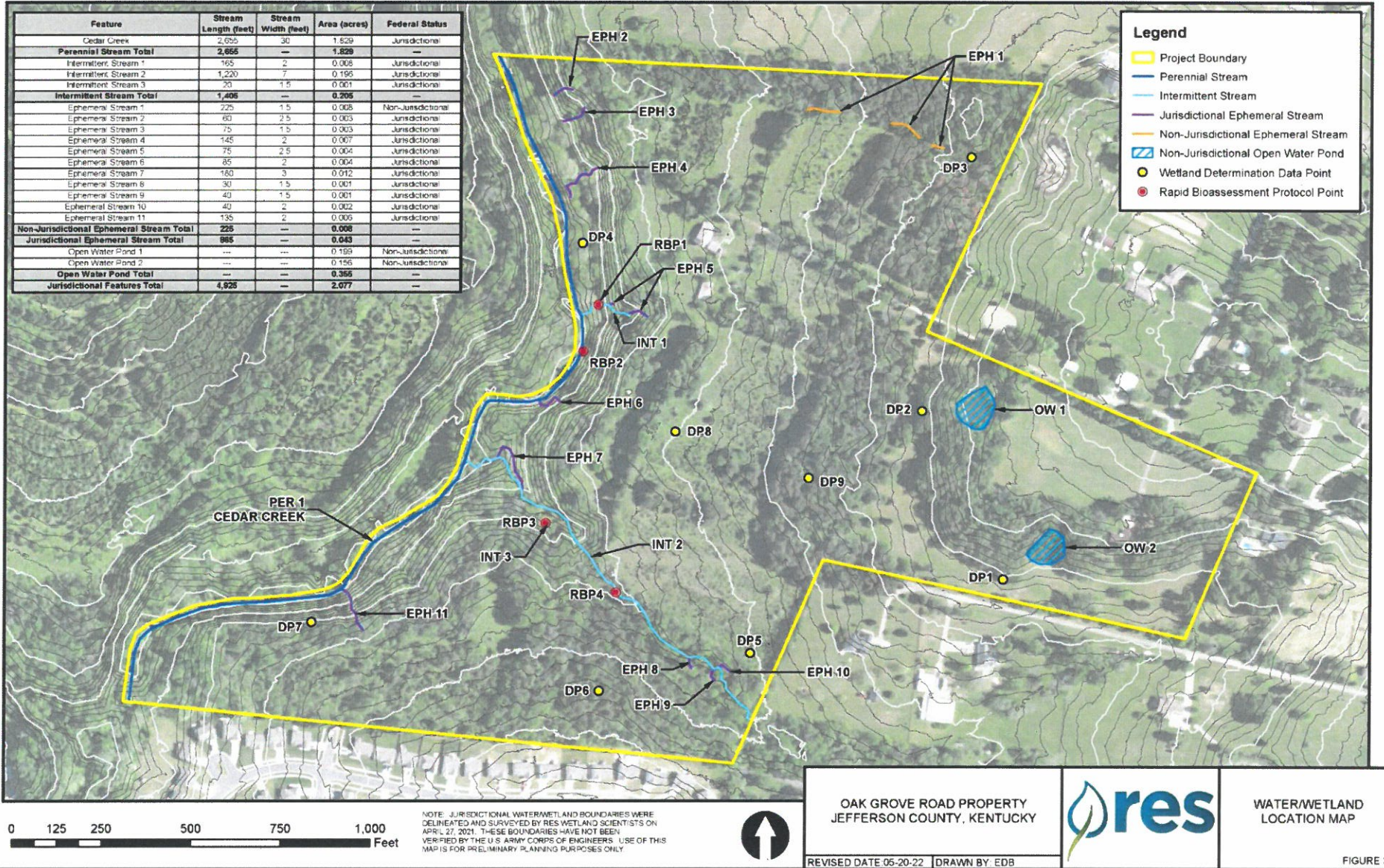


FIGURE 3



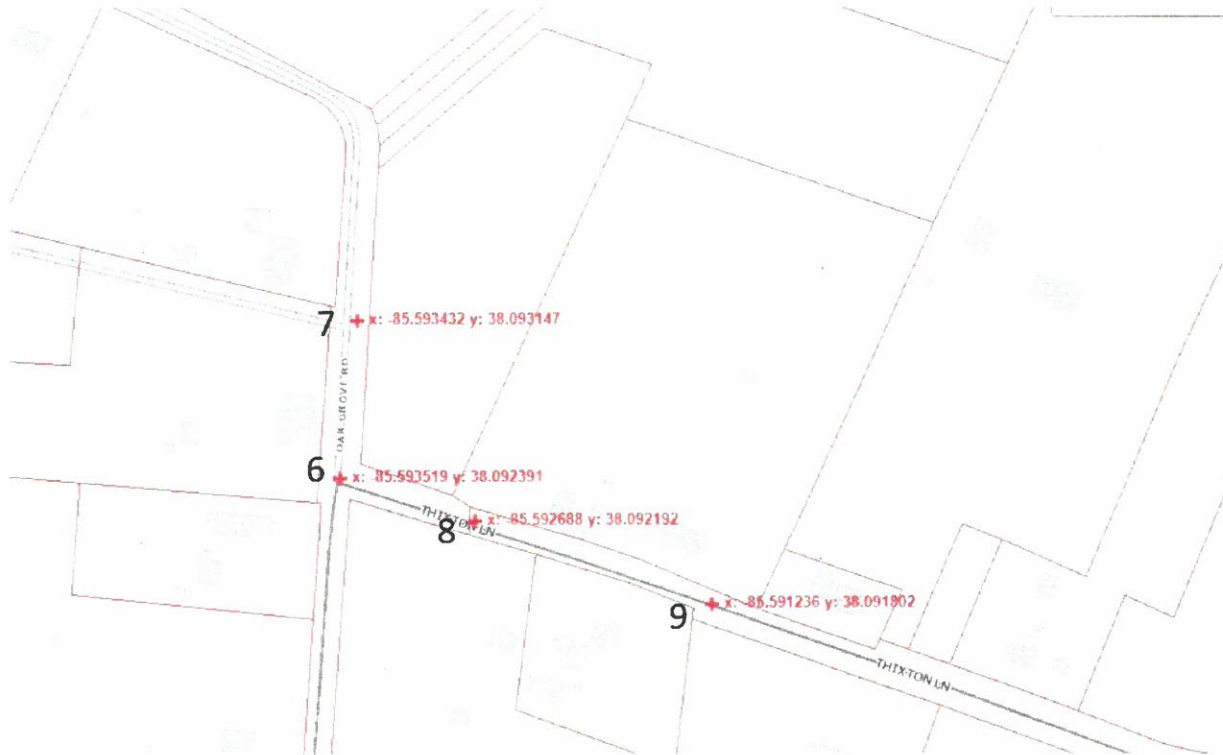
# INDEPENDENCE SCHOOL ROAD



| Event | RoadwayName         | Latitude | Longitude    | Collision Date | Collision Time | Units Involved | Motor Vehicles Involved | Number Killed | Number Injured | Weather | Rdwy Condition Code | Hit and Run | Direction                                               | Manner of Collision          | Rdwy Character       | Light Condition      |
|-------|---------------------|----------|--------------|----------------|----------------|----------------|-------------------------|---------------|----------------|---------|---------------------|-------------|---------------------------------------------------------|------------------------------|----------------------|----------------------|
| 1     | INDEPENDENCE SCHOOL | 38.10467 | -85.60735442 | 12/3/2019      | 2002           | 2              | 2                       | 0             | 0              | CLEAR   | DRY                 | FALSE       | OPPOSITE DIRECTION - BOTH VEHICLES GOING STRAIGHT AHEAD | SIDESWIPE-OPPOSITE DIRECTION | STRAIGHT & HILLCREST | DARK-HWY LIGHTED/OFF |
| 2     | INDEPENDENCE SCHOOL | 38.10382 | -85.60529063 | 1/7/2020       | 1455           | 2              | 2                       | 0             | 0              | CLEAR   | DRY                 | FALSE       | SIDESWIPE COLLISION - OPPOSITE DIRECTION                | SIDESWIPE-OPPOSITE DIRECTION | CURVE & GRADE        | DAYLIGHT             |
| 3     | INDEPENDENCE SCHOOL | 38.10389 | -85.60522909 | 12/17/2021     | 1642           | 2              | 2                       | 0             | 0              | RAINING | WET                 | FALSE       | HEAD-ON COLLISION                                       | HEAD ON                      | CURVE & GRADE        | DUSK                 |
| 4     | INDEPENDENCE SCHOOL | 38.1013  | -85.59955903 | 10/28/2019     | 1647           | 2              | 2                       | 0             | 0              | CLEAR   | DRY                 | FALSE       | SIDESWIPE COLLISION - OPPOSITE DIRECTION                | SIDESWIPE-OPPOSITE DIRECTION | STRAIGHT & LEVEL     | DAYLIGHT             |
| 5     | INDEPENDENCE SCHOOL | 38.1011  | -85.59409595 | 1/7/2019       | 0933           | 1              | 1                       | 0             | 0              | CLOUDY  | DRY                 | FALSE       | OTHER COLLISIONS ON SHOULDER                            | SINGLE VEHICLE               | STRAIGHT & LEVEL     | DAYLIGHT             |



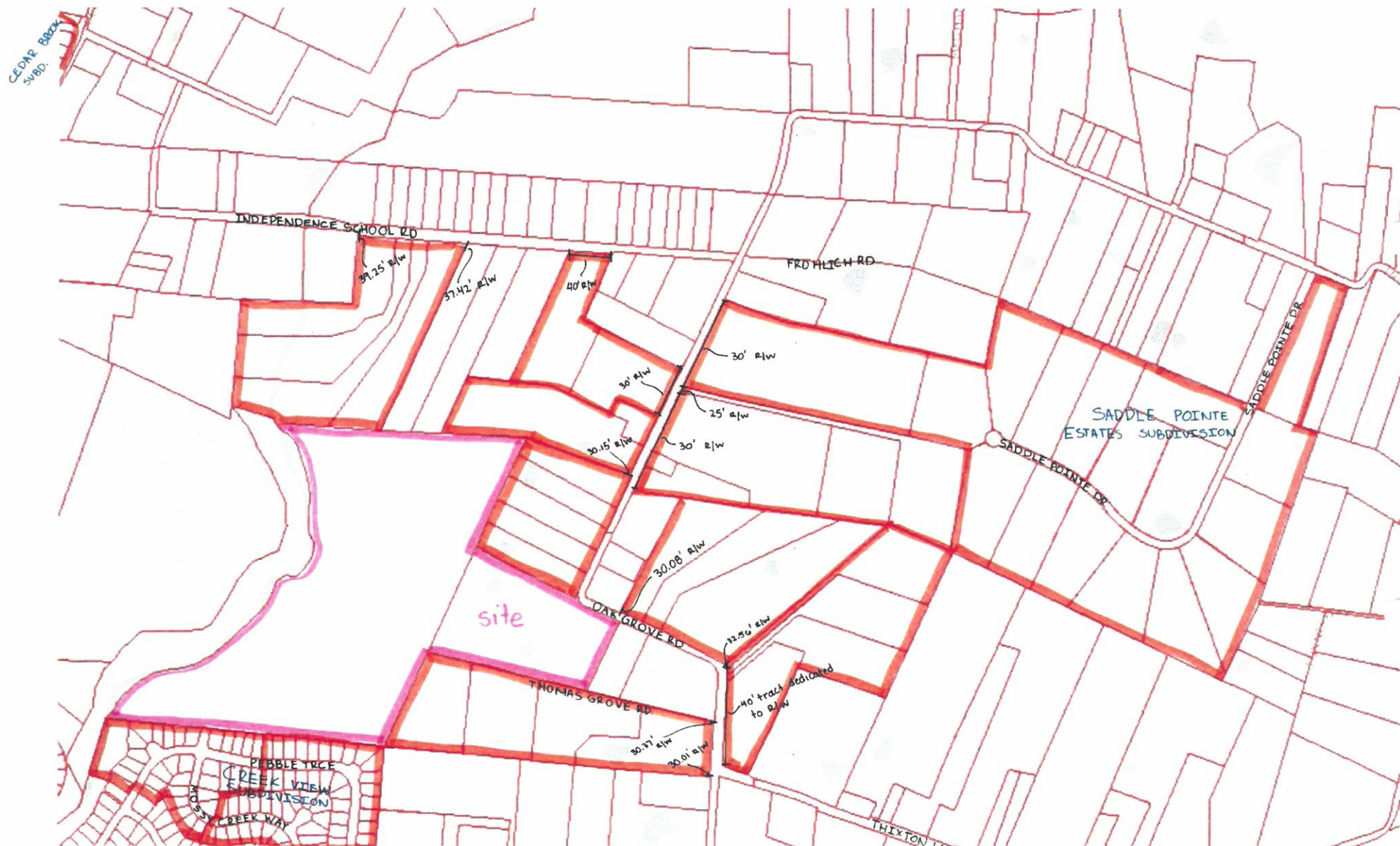
# OAK GROVE RD & THIXTON LN



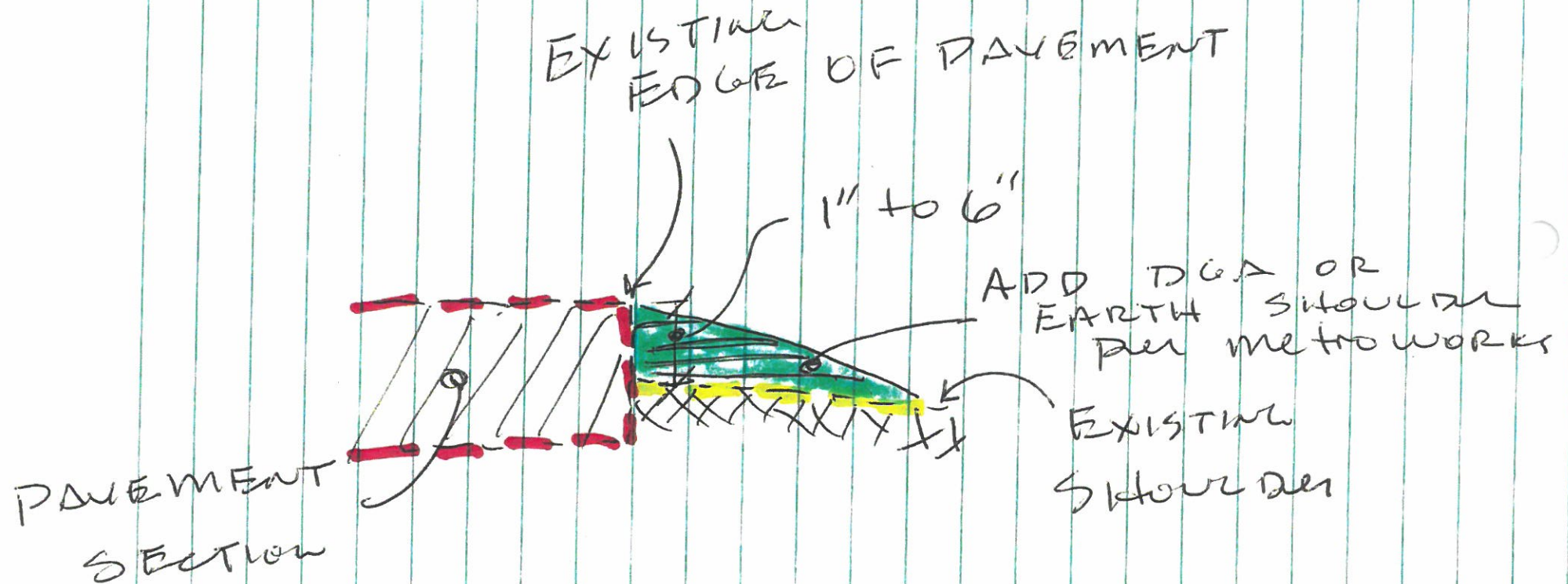
| Event | RoadwayName | Latitude | Longitude    | Collision Date | Collision Time | Units Involved | Motor Vehicles Involved | Number Killed | Number Injured | Weather | Rdwy Condition Code | Hit and Run | Direction                                                    | Manner of Collision      | Rdwy Character   | Light Condition      |
|-------|-------------|----------|--------------|----------------|----------------|----------------|-------------------------|---------------|----------------|---------|---------------------|-------------|--------------------------------------------------------------|--------------------------|------------------|----------------------|
| 6     | OAK GROVE   | 38.09239 | -85.59351963 | 12/31/2020     | 0720           | 1              | 1                       | 0             | 0              | CLOUDY  | WET                 | FALSE       | COLLISION WITH FIXED OBJECT NON - INTERSECTION - FIRST EVENT | SINGLE VEHICLE           | STRAIGHT & LEVEL | DARK-HWY LIGHTED/OFF |
| 7     | OAK GROVE   | 38.09315 | -85.59343312 | 6/27/2021      | 0519           | 1              | 1                       | 0             | 0              | CLEAR   | DRY                 | FALSE       | COLLISION WITH FIXED OBJECT IN INTERSECTION - FIRST EVENT CO | SINGLE VEHICLE           | STRAIGHT & GRADE | DARK-HWY NOT LIGHTED |
| 8     | THIXTON     | 38.09219 | -85.59268699 | 8/6/2019       | 1733           | 2              | 2                       | 0             | 0              | CLEAR   | DRY                 | FALSE       | SIDESWIPE COLLISION - SAME DIRECTION                         | SIDESWIPE-SAME DIRECTION | STRAIGHT & LEVEL | DAYLIGHT             |
| 9     | THIXTON     | 38.0918  | -85.5912368  | 11/8/2019      | 1700           | 1              | 1                       | 0             | 0              | CLEAR   | DRY                 | FALSE       | OTHER ROADWAY OR MID-BLOCK COLLISION                         | SINGLE VEHICLE           | STRAIGHT & LEVEL | DAYLIGHT             |



# Oak Grove Right-of-Way







~~SHOULDER~~  
SHOULDER IMPROVEMENT

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Ordinance for area-wide rezoning  
in area on 72 parcels, Case #9868

ORDINANCE NO. 40, SERIES 2008

AN ORDINANCE CHANGING THE ZONING FROM R-4 SINGLE-FAMILY RESIDENTIAL TO R-R RURAL RESIDENTIAL ON 732 PARCELS OF PROPERTY, AND 1011 THIXTON LANE (TAX BLOCK 0087 LOT 0243 SUB LOT 0000) SHALL REMAIN R-4 SINGLE-FAMILY RESIDENTIAL, AS IDENTIFIED FURTHER IN THE ATTACHED LEGAL DESCRIPTIONS, LOCATED IN THE THIXTON LANE AREA, CONTAINING 466.03 461.10 ACRES AND BEING IN LOUISVILLE METRO (CASE NO. 9868) (AS AMENDED)

SPONSORED BY: COUNCILMAN TOM OWEN

WHEREAS, the Legislative Council of the Louisville/Jefferson County Metro Government (the "Council") has considered the evidence presented at the public hearing held by the Louisville Metro Planning Commission and the recommendations of the Commission and its staff as set out in the minutes and records of the Planning Commission in Case No. 9868; and

WHEREAS, the Council concurs in and adopts the findings of the Planning Commission for the zoning changes in Case No. 9868 and approves and accepts the recommendations of the Planning Commission as set out in said minutes and records;

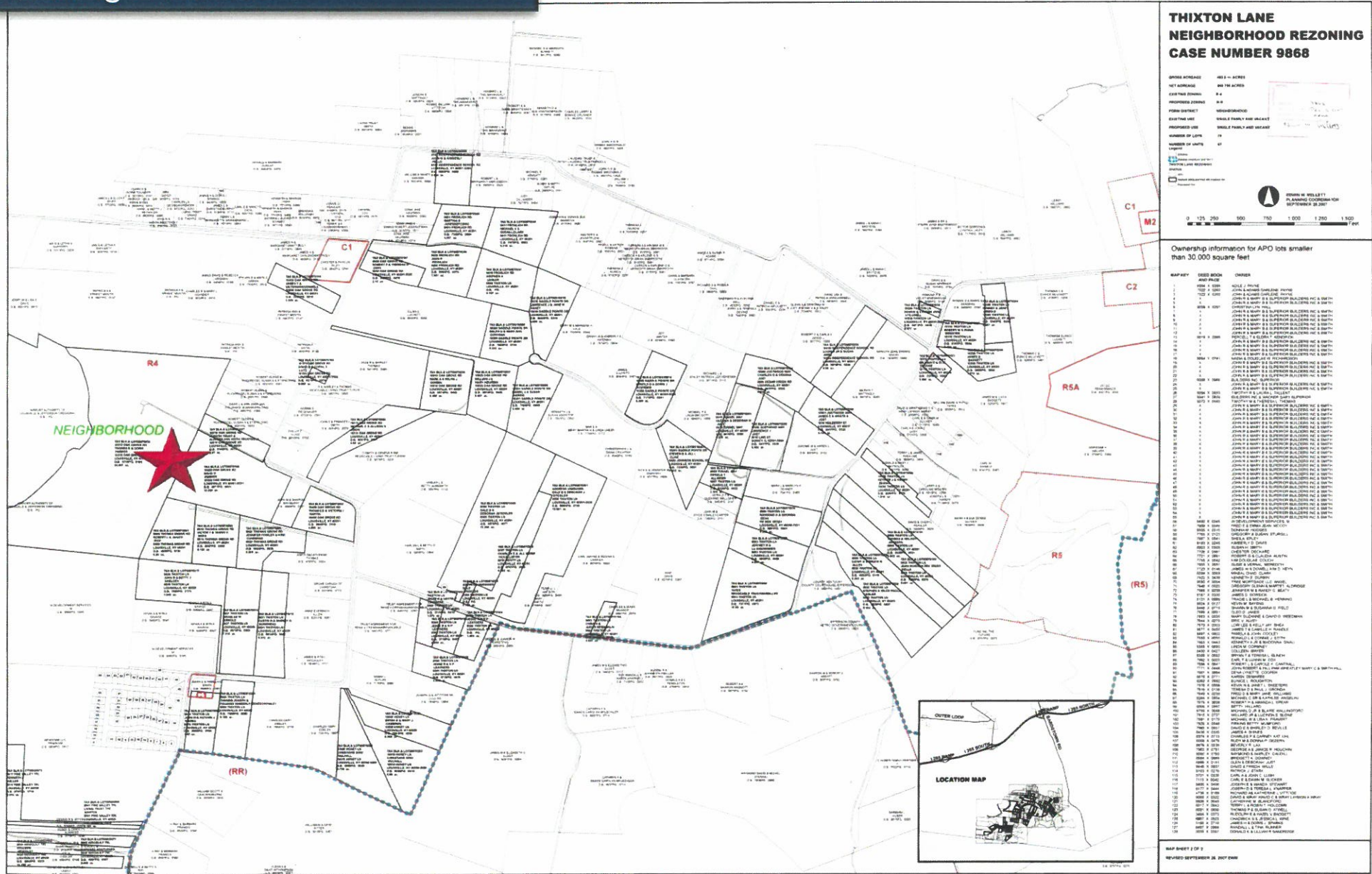
**NOW THEREFORE BE IT ORDAINED BY THE LEGISLATIVE COUNCIL OF THE LOUISVILLE/JEFFERSON COUNTY METRO GOVERNMENT AS FOLLOWS:**

**Section I:** That the properties located in the Thixton Lane Rezoning Area, as that term is defined in the minutes and records of the Planning Commission in Case No. 9868, containing 466.03 461.10 acres and being in Louisville Metro, more particularly described in said minutes and records, are hereby rezoned from R-4 Single Family

000467



# Properties within the area-wide rezoning in #9868



## THIXTON LANE NEIGHBORHOOD REZONING CASE NUMBER 9868

|                 |                    |        |
|-----------------|--------------------|--------|
| SPUR INCREASE   | 400.00             | 400.00 |
| NET INCREASE    | 400.00             | 400.00 |
| EXISTING ZONING | R-4                |        |
| PROPOSED ZONING | R-4                |        |
| FORM NUMBER     | 9868               |        |
| EXISTING USE    | SMALL FAMILY HOME  |        |
| PROPOSED USE    | SMALL FAMILY HOME  |        |
| NUMBER OF LOTS  | 14                 |        |
| NUMBER OF MAPS  | 14                 |        |
| DATE            | SEPTEMBER 26, 2007 |        |

### Ownership information for APO lots smaller than 30,000 square feet

| MAP SHEET | DEED BOOK AND PAGE | OWNER           |
|-----------|--------------------|-----------------|
| 1         | 1000 X 1000        | JOHN & JANE DOE |
| 2         | 1000 X 1000        | JOHN & JANE DOE |
| 3         | 1000 X 1000        | JOHN & JANE DOE |
| 4         | 1000 X 1000        | JOHN & JANE DOE |
| 5         | 1000 X 1000        | JOHN & JANE DOE |
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| 99        | 1000 X 1000        | JOHN & JANE DOE |
| 100       | 1000 X 1000        | JOHN & JANE DOE |



Save Our Cedar Creek  
Watershed Rural Heritage

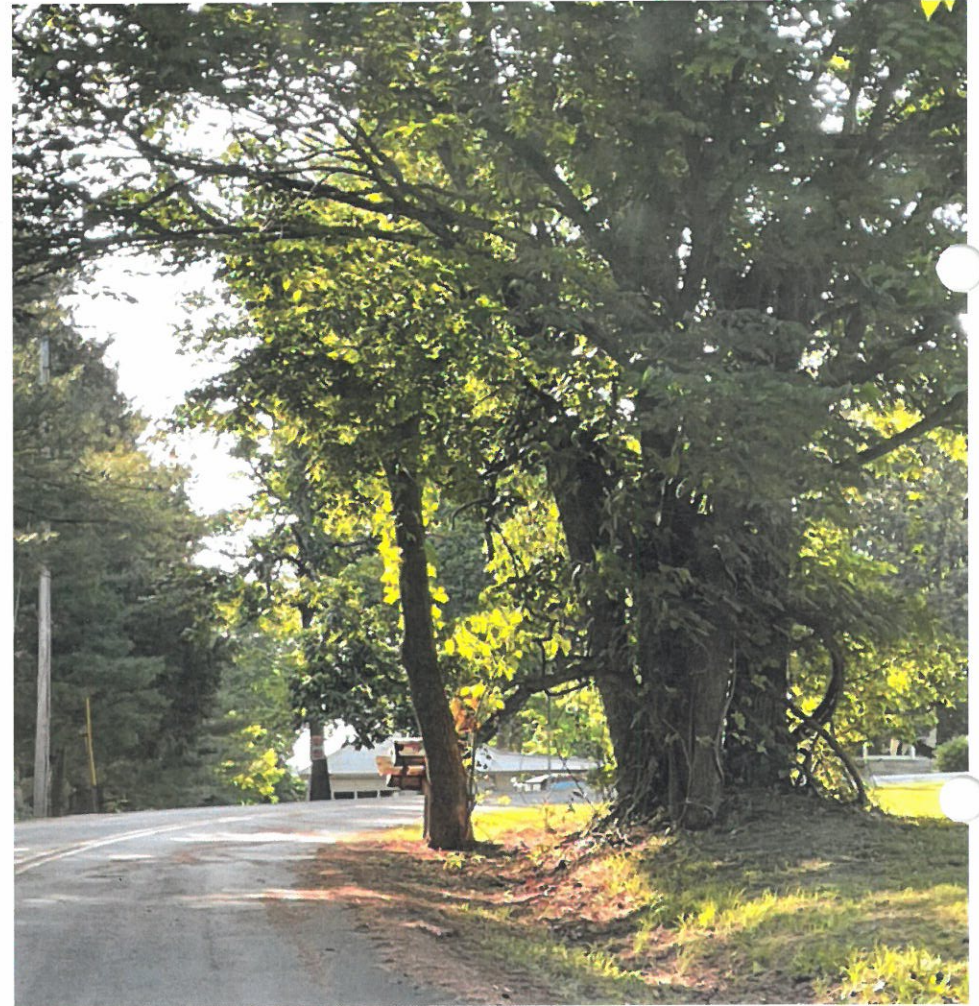




These are our homes, and farms and pride

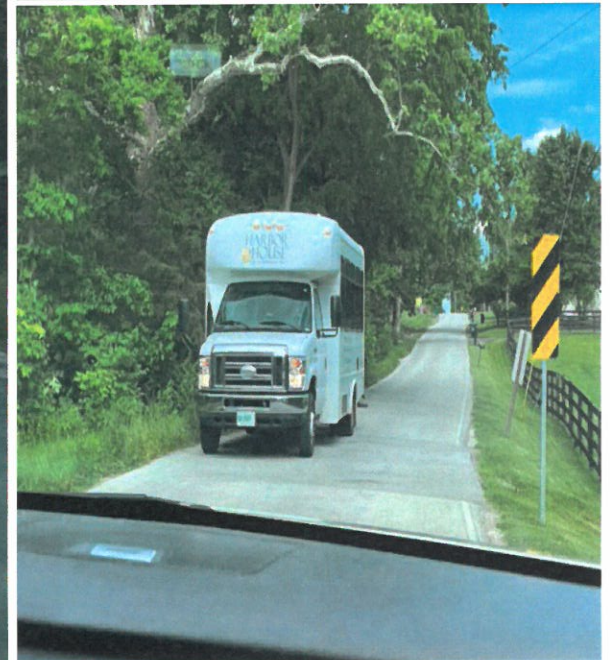
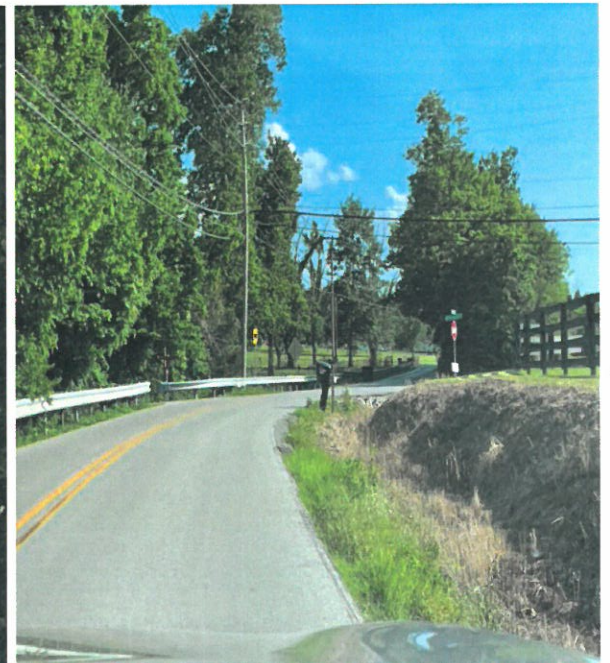




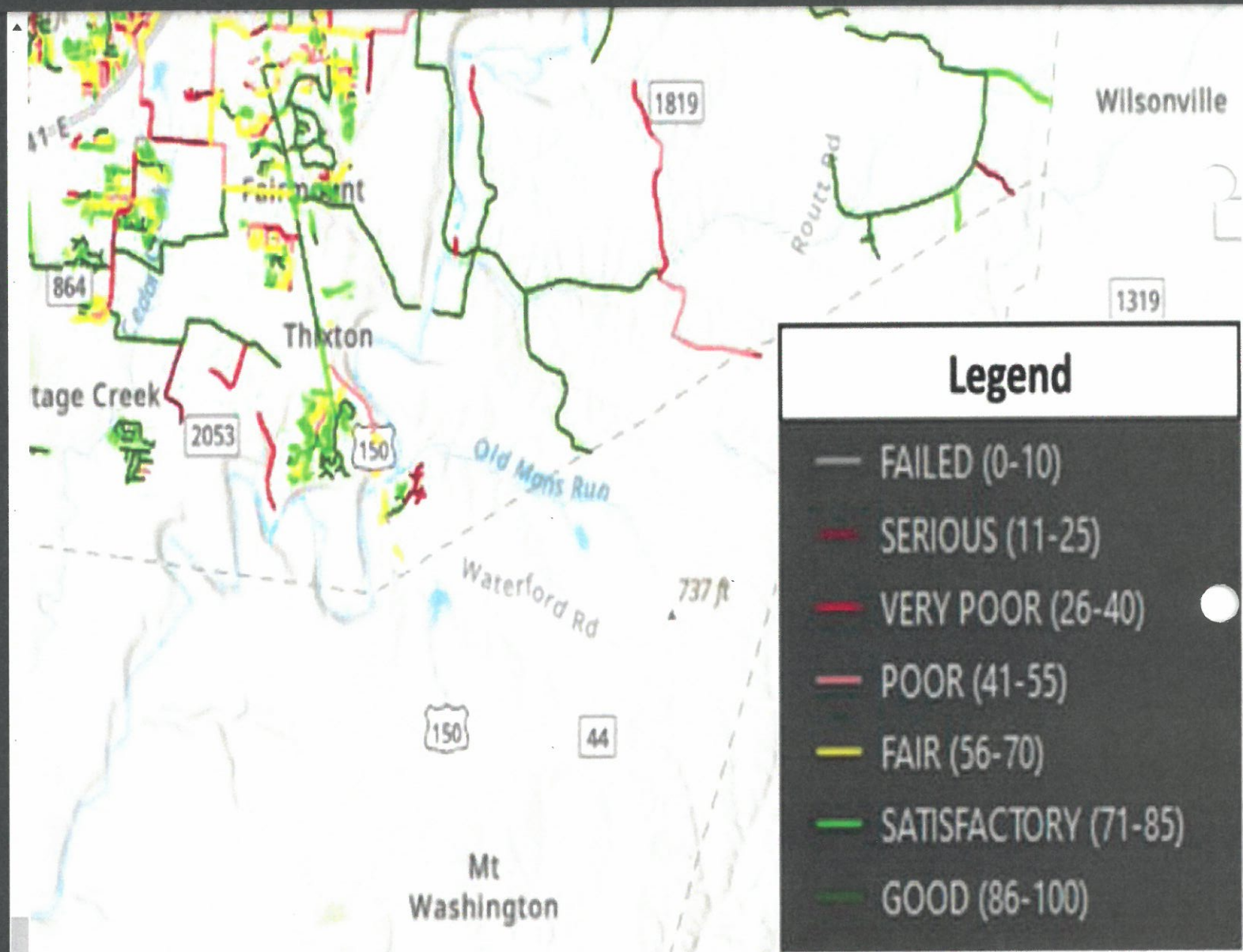


Oak grove shoulder, sign placement and damage  
and curve at entrance









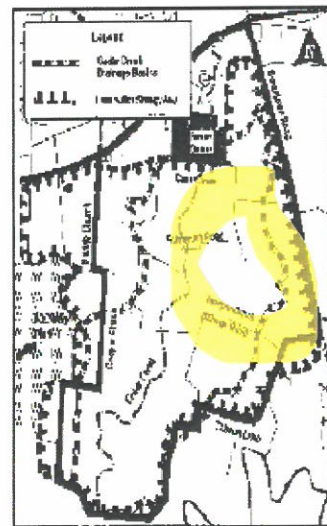
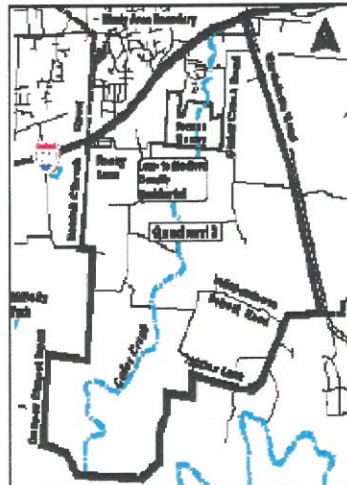


## Quadrant III: Southwestern Quadrant

Preserve the existing rural residential and agricultural character of the southwestern quadrant while protecting the most significant natural resource in the quadrant, the Cedar Creek watershed. Such preservation would include strict regulation of the type and scale of development permitted in area.

### Key Implementing Actions

- Conduct a study for a relatively large sparsely developed area south of the Gene Snyder Freeway and west of Bantown Road to aid in the development of a preservation strategy for the area.
- Promote the use of the *Jefferson County Environmental Trust* as a tool for landowners to use for the preservation of their land.
- Encourage only medium to low density residential land uses for the vacant land in the southeast quadrant of the Gene Snyder Freeway/Biculah Church Road interchange.
- Designate a bikeway along Cedar Creek Road, Gentry Lane, and Palmyra Road to create a "loop" network.



## 8.2.2 Existing Rural, Agricultural Land

Preservation of the rural, agricultural landscape that characterizes the majority of this area is a top concern of the residents of Quadrant III. In fact, many public comments have recommended land uses no more intense than one house per five acres (i.e., R-R "rural residential" zoning). However, nearly all the land is currently zoned R-4, which permits 4.8 detached houses per acre. Seeking to prevent this type of development, many citizens signed and presented a petition to have the area downzoned. Their action presents the community with several options, which range from permitting the development of numerous of R-4-style residential neighborhoods, to undertaking an area-wide rezoning to R-R.

If the area's rural character is to be maintained, there are many interrelated variables and issues that will have to be addressed, including 1) identifying the geographic areas that should be preserved versus those appropriate for development, 2) determining the appropriate intensity of development and associated zoning designation, or mix of zoning designations, that should be used in the quadrant, 3) identifying other options to downzoning, such as the dedication of a conservation easement or easements to a land trust or creating design measures to preserve the area's rural character, and creating a development review overlay district to achieve the residents' goals of environmental protection and rural character preservation, 4) determining what transportation improvements would be needed in the quadrant, and 5) assessing the potential impacts to surrounding areas. These issues are briefly dis-

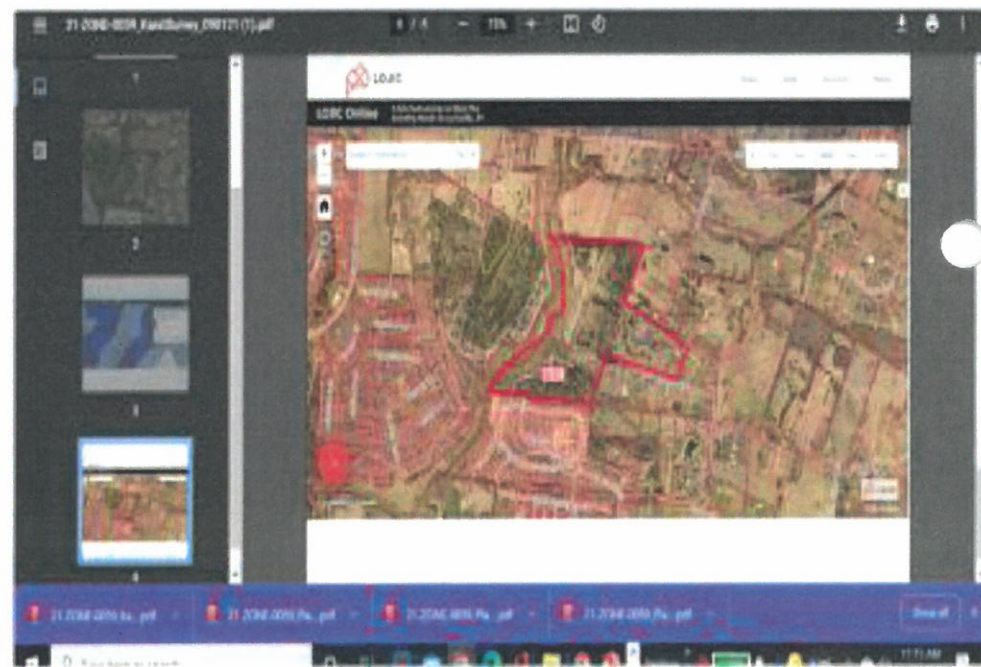
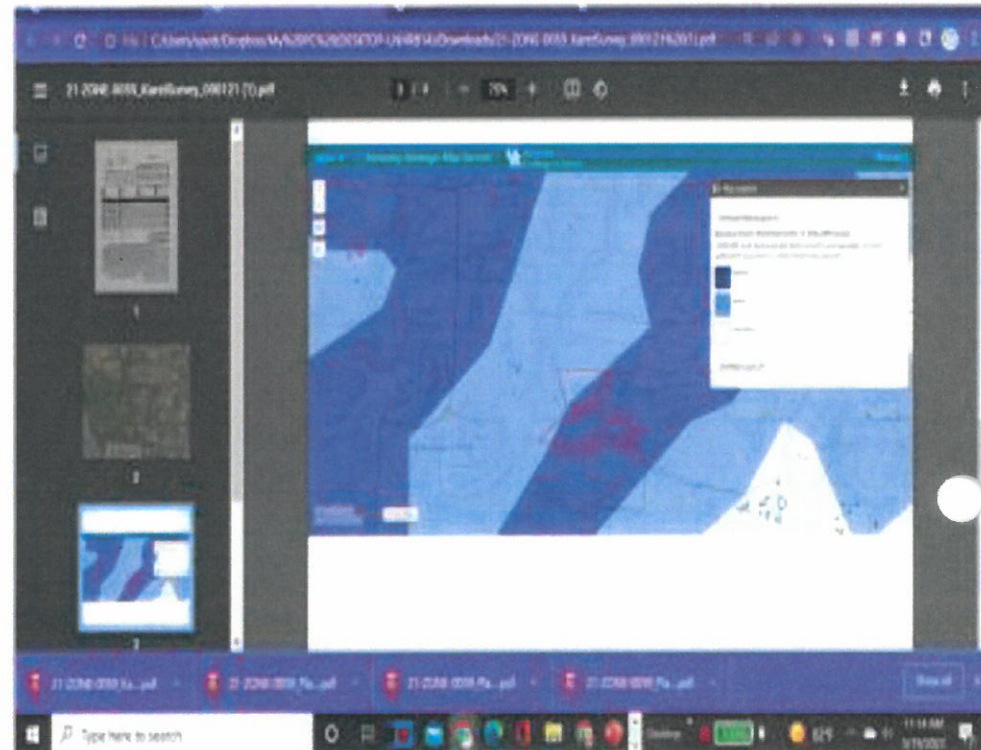
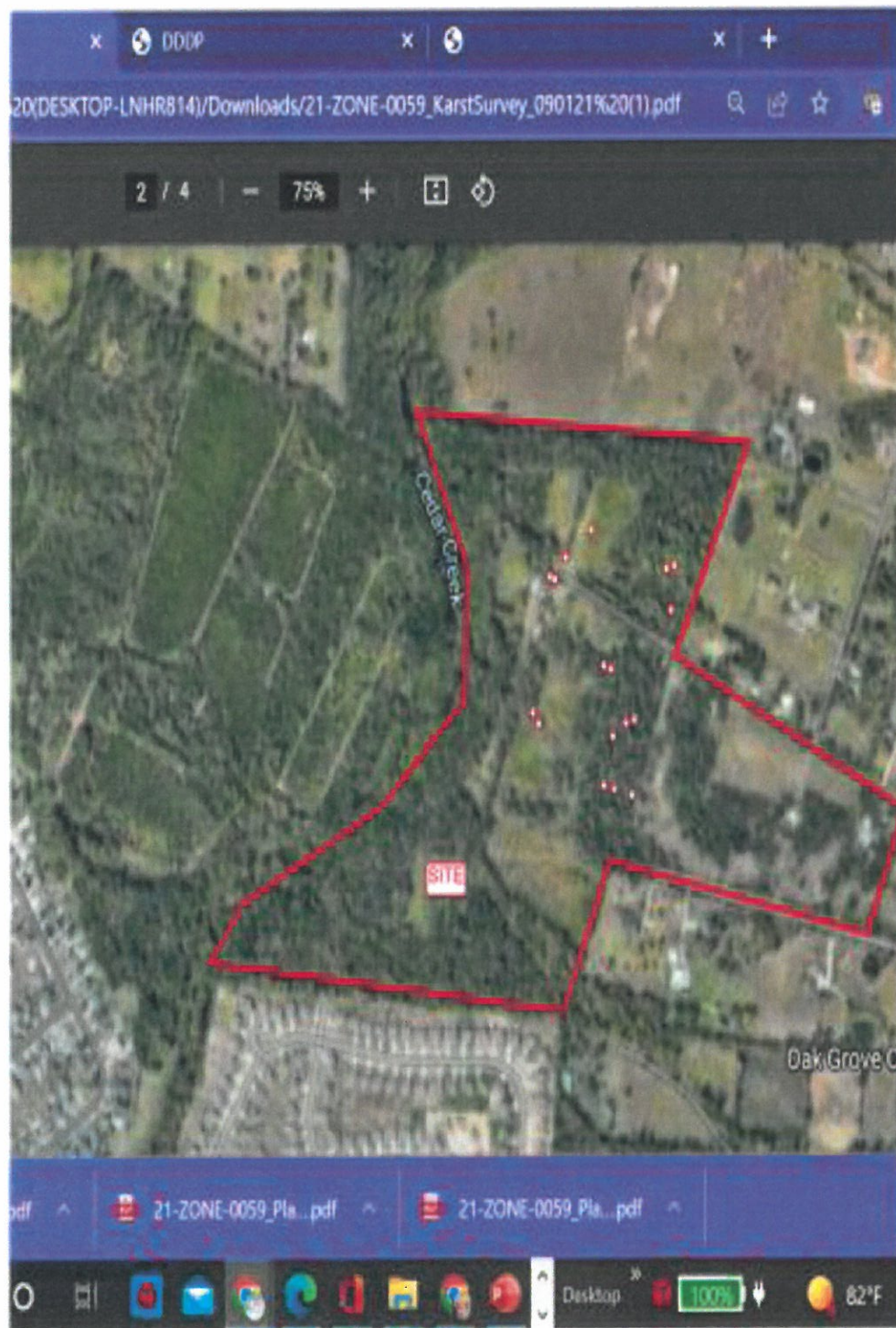














Dear Mr. Schutte:

RES Kentucky, LLC dba Redwing (Redwing) is pleased to provide JSCC, LLC with this Water/Wetland Delineation Summary Report for the Oak Grove Road Property in Jefferson County, Kentucky. The 68-acre site is located on the west side of Oak Grove Road, approximately 0.4 mile south of Independence School Road (Figure 1). The project site is composed of two parcels: 10212 and 10302 Oak Grove Road. The goal of these services was to identify the location and extent of jurisdictional waters/wetlands and federally threatened/endangered (T/E) species habitat within the project area to assist JSCC, LLC and Mindel, Scott & Associates, Inc. (MSA) with preliminary project planning.

Based on the delineation, jurisdictional water/wetland features present on the site include one perennial stream (Cedar Creek) measuring 2,665 linear feet (1.829 acres) and three intermittent streams totaling 1,405 linear feet (0.205 acre) (Figure 2). Non-jurisdictional features on site include 11 ephemeral streams totaling 1,090 linear feet (0.051 acre) and two open water ponds totaling 0.355 acre.

In addition, suitable habitat for federally-listed T/E species on site includes: suitable summer roosting habitat for the Indiana bat (*Myotis sodalis*) and the northern long-eared bat (*Myotis septentrionalis*) in the in the mixed-aged woods; and foraging habitat for the gray bat (*Myotis grisescens*) along Cedar Creek. Although marginal suitable habitat for Kentucky glade cress (*Leavenworthia exigua laciniata*) was identified, no individuals are present. No other suitable habitat for T/E species was identified in the project area.





Under the Section 404 permitting process, the USACE determines if consultation with the U.S. Fish and Wildlife Service (USFWS) is required to address potential impacts to T/E species and if consultation with the State Historic Preservation Office (SHPO) is required to address potential impacts to significant archaeological/historic features.

Based on the development plan provided by MSA, there is only one proposed crossing on the upstream portion of Intermittent Stream 2. If the crossing can be bridged, resulting in no impacts to Intermittent Stream 2, no permit from the USACE or KDOW-WQC Section will be required for the project and therefore, no consultation with the USFWS and SHPO is required. If the crossing will be culverted, the project can be authorized under a NWP 14 for linear transportation without notification to the USACE and no coordination with KDOW-WQC Section would be required. However, coordination with the USFWS and SHPO may be required.

## CONCLUSION

Based on the delineation, jurisdictional water/wetland features present on the site include one perennial stream (Cedar Creek) measuring 2,665 linear feet (1.829 acres) and three intermittent streams totaling 1,405 linear feet (0.205 acre) (Figure 2). Non-jurisdictional features identified in the









**100.2111 Alternative regulation for zoning map amendment.**

A legislative body or fiscal court may adopt, in lieu of the provisions of KRS 100.211, a regulation to provide as follows:

- (1) A proposal for a map amendment may originate with the planning commission of the unit, with any fiscal court or legislative body which is a member of the unit, or with the owner of the property in question.
- (2) Regardless of the origin of the proposed amendment, it shall be referred to the planning commission before adoption.
- (3) The planning commission shall then hold at least one (1) public hearing after notice as required by KRS Chapter 424 and this chapter and make recommendations to the various bodies or fiscal courts involved.
- (4) A planning commission recommendation relating to the proposed amendment shall become final and the map amendment shall be automatically implemented subject to the provisions of KRS 100.347, all as set forth in the planning commission recommendations, unless within twenty-one (21) days after the final action by the planning commission:
  - (a) Any aggrieved person files a written request with the planning commission that the final decision shall be made by the appropriate legislative body or fiscal court; or
  - (b) The appropriate legislative body or fiscal court files a notice with the planning commission that the legislative body or fiscal court shall decide the map amendment.
- (5) It shall take a majority of the entire legislative body or fiscal court to override the recommendation of the planning commission.
- (6) All procedures for public notice and publication as well as for adoption shall be the same as for the original enactment of a zoning regulation, and the notice of publication shall include the street address of the property in question, or if one is not available, or if it is not practicable due to the number of addresses involved, a geographic description sufficient to locate and identify the property, and the names of the two (2) streets on either side of the property which intersect the street on which the property is located. If the property is located at the intersection of two (2) streets, the notice shall designate the intersection by name of both streets rather than name the two (2) streets on either side of the property.

Effective: July 15, 1988

History: Created 1988 Ky. Acts ch. 31, sec. 1, effective July 15, 1988.



**100.213 Findings necessary for proposed map amendment – Reconsideration.**

- (1) Before any map amendment is granted, the planning commission or the legislative body or fiscal court must find that the map amendment is in agreement with the adopted comprehensive plan, or, in the absence of such a finding, that one (1) or more of the following apply and such finding shall be recorded in the minutes and records of the planning commission or the legislative body or fiscal court:
  - (a) That the existing zoning classification given to the property is inappropriate and that the proposed zoning classification is appropriate;
  - (b) That there have been major changes of an economic, physical, or social nature within the area involved which were not anticipated in the adopted comprehensive plan and which have substantially altered the basic character of such area.
- (2) The planning commission, legislative body, or fiscal court may adopt provisions which prohibit for a period of two (2) years, the reconsideration of a denied map amendment or the consideration of a map amendment identical to a denied map amendment.

**Effective:** July 15, 1986

**History:** Amended 1986 Ky. Acts ch. 141, sec. 21, effective July 15, 1986. — Amended 1980 Ky. Acts ch. 325, sec. 1, effective July 15, 1980. — Amended 1968 Ky. Acts ch. 198, sec. 1. — Created 1966 Ky. Acts ch. 172, sec., 24.

**100.182 Effect of failure to comply strictly with procedural provisions or publication requirements – Limitation.**

All other provisions of this chapter to the contrary notwithstanding, no comprehensive plan, land use or zoning regulation, subdivision regulation, public improvements program, or official map regulation shall be invalidated in its entirety for failure to strictly comply with any procedural provision of this chapter or with the requirements of KRS Chapter 424 in making any publication required to be made under this chapter, unless a court finds that the failure to strictly comply with any procedural requirement results in material prejudice to the substantive rights of an adversely affected person and that such rights cannot be adequately secured by any remedy other than invalidating the comprehensive plan, land use or zoning regulation, subdivision regulation, public improvements program, or official map regulation in its entirety.

**Effective:** July 15, 1986

**History:** Amended 1986 Ky. Acts ch. 141, sec. 9, effective July 15, 1986. — Created 1984 Ky. Acts ch. 412, sec. 1, effective July 13, 1984.



ORDINANCE NO. 067, SERIES 2021

**AN ORDINANCE RELATING TO THE ZONING OF PROPERTIES LOCATED AT 8000 AND 8006 CEDAR CREEK ROAD AND PARCEL ID 065600310000 CONTAINING APPROXIMATELY 19.7 ACRES AND BEING IN LOUISVILLE METRO (CASE NO. 20ZONE0060) (AMENDMENT BY SUBSTITUTION).**

**SPONSORED BY: COUNCIL MEMBER BRENT ACKERSON**

**WHEREAS**, the Legislative Council of the Louisville/Jefferson County Metro Government (the "Council") has considered the evidence presented at the public hearing held by the Louisville Metro Planning Commission (the "Planning Commission") and the recommendations of its Staff as set out in the minutes and records of the Planning Commission in Case No. 20ZONE0060; and

**WHEREAS**, the Council rejects the findings of the Planning Commission denying the zoning change in Case No. 20-ZONE-0060 and has made alternative findings of fact based on the Planning Commission's record that the proposed zoning change is in compliance with the Goals, Objectives and Policies of the Comprehensive Plan ("Plan 2040") which support the approval of the application to rezone the subject property from R-4 to R-6; and

**WHEREAS**, the Council makes the following findings of fact based upon the record established before the Planning Commission for Case No. 20ZONE0060 in order to reject the recommendation of the Planning Commission and to change the existing R-4 Residential designation to R-6 on the property located at 8000 and 8006 Cedar Creek Road and Parcel ID No. 065600310000, and being in Louisville Metro; and

**WHEREAS**, contrary to the Planning Commission's findings, the proposed plan includes stub connections to the north and south such that the approved and existing

**100.2111 Alternative regulation for zoning map amendment.**

A legislative body or fiscal court may adopt, in lieu of the provisions of KRS 100.211, a regulation to provide as follows:

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- (2) Regardless of the origin of the proposed amendment, it shall be referred to the planning commission before adoption.
- (3) The planning commission shall then hold at least one (1) public hearing after notice as required by KRS Chapter 424 and this chapter and make recommendations to the various bodies or fiscal courts involved.
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  - (a) Any aggrieved person files a written request with the planning commission that the final decision shall be made by the appropriate legislative body or fiscal court; or
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Effective: July 15, 1988

History: Created 1988 Ky. Acts ch. 31, sec. 1, effective July 15, 1988



The meeting with Brent & Jon went fabulously. Brent called Piagentini during our meeting. Piagentini was in a budget meeting but agreed to call him after it. Brent loved our case, will lead the charge with Engel and Piagentini. Said having our case to overturn PC to support development was the perfect counter-balance to the overturns of 2-3 approvals of PC. Said the abortion/sidewalk issue will be debated for the full 90 minute limit (we are after that on the agenda) and that Engel who is pro life will be very animated over the issue. Will work it out to give Engel cover. Will file Bill's ordinance today (which he said the creation of which was the heavy lift that he was glad was already done and made his job much easier and would discuss same with his friend at County Attorney's office).

It goes without saying but I'll say it anyway. We need to make sure David James and the rest of the Dems show up. Sherman I'm counting on you to have Keisha fully informed and make sure David James is on board. Let me know if you have any indication they aren't. I will call Madonna today to work with her and make sure she isn't surprised. I also am likely to call my friend in state government to make sure he touches David James again.

Scott Hagan  
Principal

Personal Privacy Exemption

**HAGAN**  
PROPERTIES

On May 19, 2021, at 4:22 PM, Bill Bardenwerper [Personal Privacy Exemption] wrote:  
Scott: So are you saying Robin was insistent that it's his way or the highway — in other words that it has to be sent back to the PC? If so, is he asking them to consider some specific change or concession on your part, or is he asking 2 PCers to simply consider doing a total 180? B

On May 19, 2021, at 3:32 PM, SCOTT HAGAN [Personal Privacy Exemption] wrote: I'm with you.

Scott Hagan  
Hagan Properties  
12911 Reamers Road  
Louisville, KY 40245

On May 19, 2021, at 3:02 PM, Layson Hagan [Personal Privacy Exemption] wrote:

Who is Robin's opponent in the next election? I will be supporting with the maximum campaign contribution .. Sort of rhetorical but not really.

Sent from my iPhone

On May 19, 2021, at 1:43 PM, SCOTT HAGAN [Personal Privacy Exemption] wrote:

Robin Engel called. Long conversation. He is sending it back for reconsideration not to overturn. Discussed 90 day rule, Dante St Germaine, extensive findings of fact that PC cant overcome, other counties routinely overturning their PCs, need for density to do quality, caught in the middle with PC not wanting to get an approval overturned like with LDG so they just denied us

Scott Hagan

From: SCOTT HAGAN  
Sent: Wednesday, May 19, 2021 9:42 AM  
To: Wendy Hagan [Personal Privacy Exemption]; Layson Hagan [Personal Privacy Exemption]; Tommy Edwards [Personal Privacy Exemption]; John McCarthy [Personal Privacy Exemption]; Sherman Brown [Personal Privacy Exemption]; Scott Jones [Personal Privacy Exemption]; Bill Bardenwerper' [Personal Privacy Exemption]  
Subject:



**Brent Ackerson**

**From:** [Redacted]  
**Sent:** Wednesday, May 19, 2021 6:32 PM  
**To:** Brent Ackerson  
**Subject:** Fwd: Hagan-Cedar Ck

See below.

Scott Hagan  
Hagan Properties  
12911 Reamers Road  
Louisville, KY 40245

Begin forwarded message:

**From:** Bill Bardenwerper [Redacted]  
**Date:** May 19, 2021 at 5:05:30 PM EDT  
**To:** SCOTT HAGAN [Redacted]  
**Cc:** Layson Hagan [Redacted] Wendy Hagan [Redacted] Tommy Edwards [Redacted] John McCarthy [Redacted] Sherman Brown [Redacted] Scott Jones [Redacted] "Jon Goldberg" [Redacted]  
**Subject:** Hagan-Cedar Ck

So I checked the planning commission and Metro Council dates. If the PC reconsiders but doesn't change its vote from no to yes, then at its meeting if June 3, it'll have to take action to return its no vote to MC so MC can finally decide at its schedules June 10 or 24, mtg, as the 90-day clock runs July 12, and yet MC is on summer break until July 22. But if the PC somehow somehow miraculously finds a way to reverse itself, then the 90-day clock starts all over again.

I'm betting that, in addition to being a nervous-nelly, Robin is talking with PDS which in turn is discouraging him from allowing an override.

Further, my law partner (and former PC and MC atty) Paul Whitty agrees with me that PDS staff will be uncooperative in helping PCers find ways to reverse itself and make the rezoning work and in writing findings of fact to reverse what the PC said if asked by the PC to do so.

Sadly, PDS staff in the waning years of Fischer's Administration have reverted to their old ways of being overly (negatively) opinionated and unhelpful. Bill

Bill Bardenwerper  
[Redacted]  
c/o BARDENWERPER TALBOTT & ROBERTS  
[www.bardlaw.net](http://www.bardlaw.net)  
(Firm Celebrating 35 yrs in 2022)

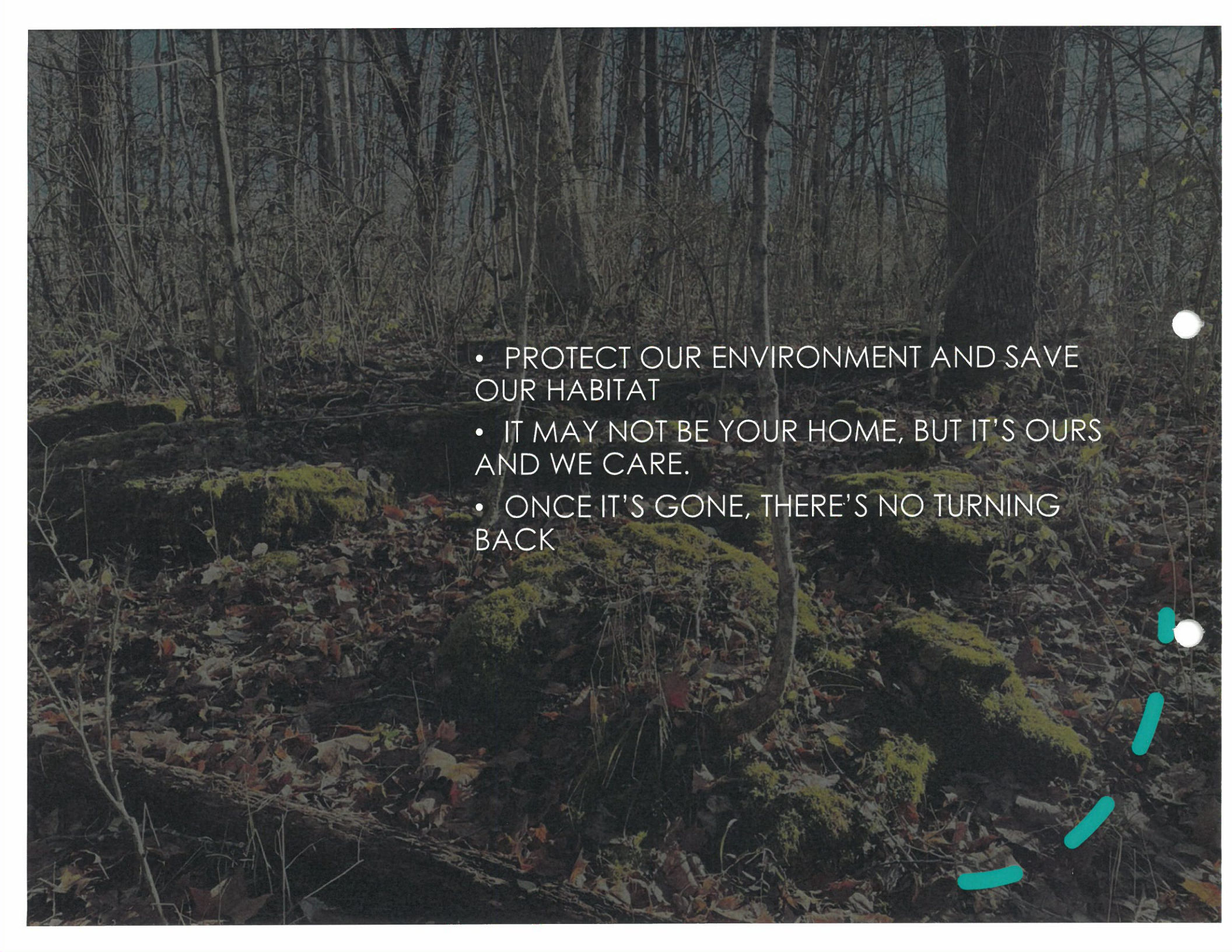




STOP THE DESTRUCTION AND  
CORRUPTION!





- 
- PROTECT OUR ENVIRONMENT AND SAVE OUR HABITAT
  - IT MAY NOT BE YOUR HOME, BUT IT'S OURS AND WE CARE.
  - ONCE IT'S GONE, THERE'S NO TURNING BACK



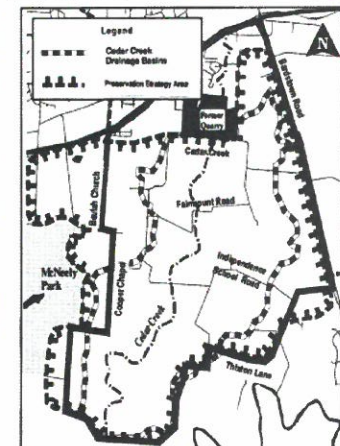
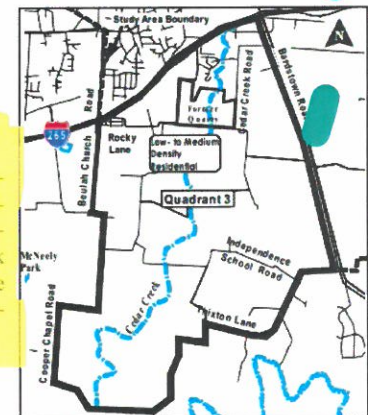
- PROTECT FERN CREEK, QUADRANT 3
- WATERSHED PRESERVATION

### Ant III: Southwestern Quadrant

ve the existing rural residential and agricultural character of the southwestern quadrant, while protecting the most significant natural resource in the quadrant, the Cedar Creek watershed. Such preservation would include strict regulation of the type and scale of development permitted in area.

#### Key Implementing Actions

- Conduct a study for a relatively large sparsely developed area south of the Gene Snyder Freeway and west of Bardstown Road to aid in the development of a preservation strategy for the area.
- Promote the use of the *Jefferson County Environmental Trust* as a tool for landowners to use for the preservation of their land.
- Encourage only medium to low density residential land uses for the vacant land in the southeast quadrant of the Gene Snyder Freeway/Beulah Church Road interchange.
- Designate a bikeway along Cedar Creek Road, Gentry Lane, and Fairmount Road to create a "loop" network.





# DOCKET NO. 21-ZONE-0059

ZONE CHANGE FROM R-R TO R-4  
AND A LDC 4.7.7 BALANCED  
TRANSFER SUBDIVISION TO ALLOW A  
180-LOT SINGLE FAMILY SUBDIVISION  
ON PROPERTY LOCATED AT  
10212 AND 10302 OAK GROVE ROAD  
(PREVIOUSLY PROPOSED WITH 263 LOTS)

## Louisville Metro Land Development & Transportation Committee – May 19, 2022

### Neighborhood Meeting

April 12, 2022

### Louisville Metro Council

Remanded to Planning Commission  
March 17, 2022

### Louisville Metro Planning Commission Public Hearing

December 16, 2021

### Louisville Metro Land Development & Transportation Committee

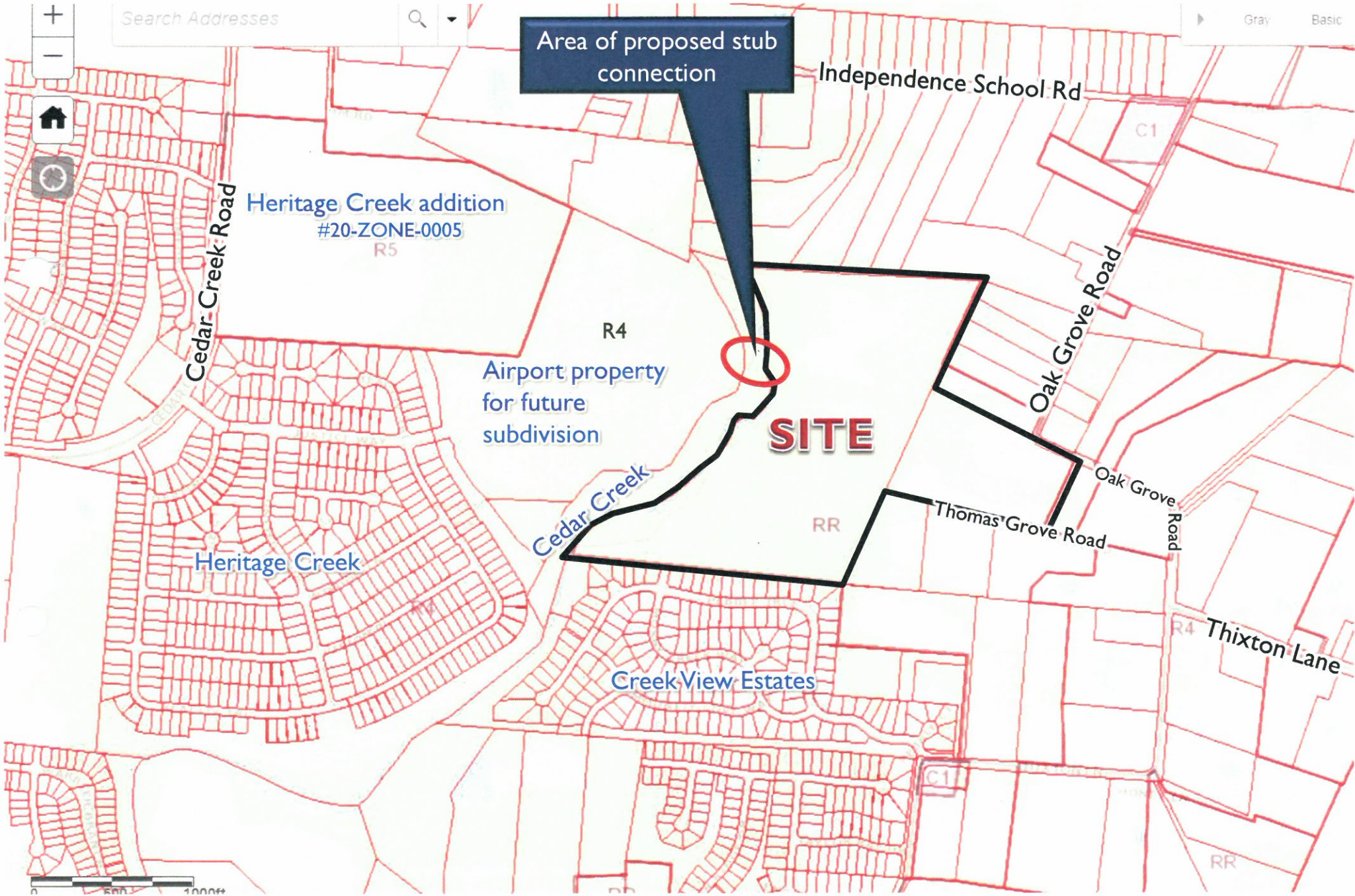
November 11, 2021

### Neighborhood Meeting

April 19, 2021

Attorneys: Bardenwerper Talbott & Roberts, PLLC  
Land Planners, Landscape Architects & Engineers: Mindel Scott & Associates, Inc.  
Traffic Engineer: Diane B. Zimmerman  
Ecological Consultant: RES (Redwing)





Area of proposed stub connection

Independence School Rd

Heritage Creek addition  
#20-ZONE-0005

Cedar Creek Road

R4

Airport property  
for future  
subdivision

**SITE**

Oak Grove Road

Cedar Creek

Heritage Creek

Thomas' Grove Road

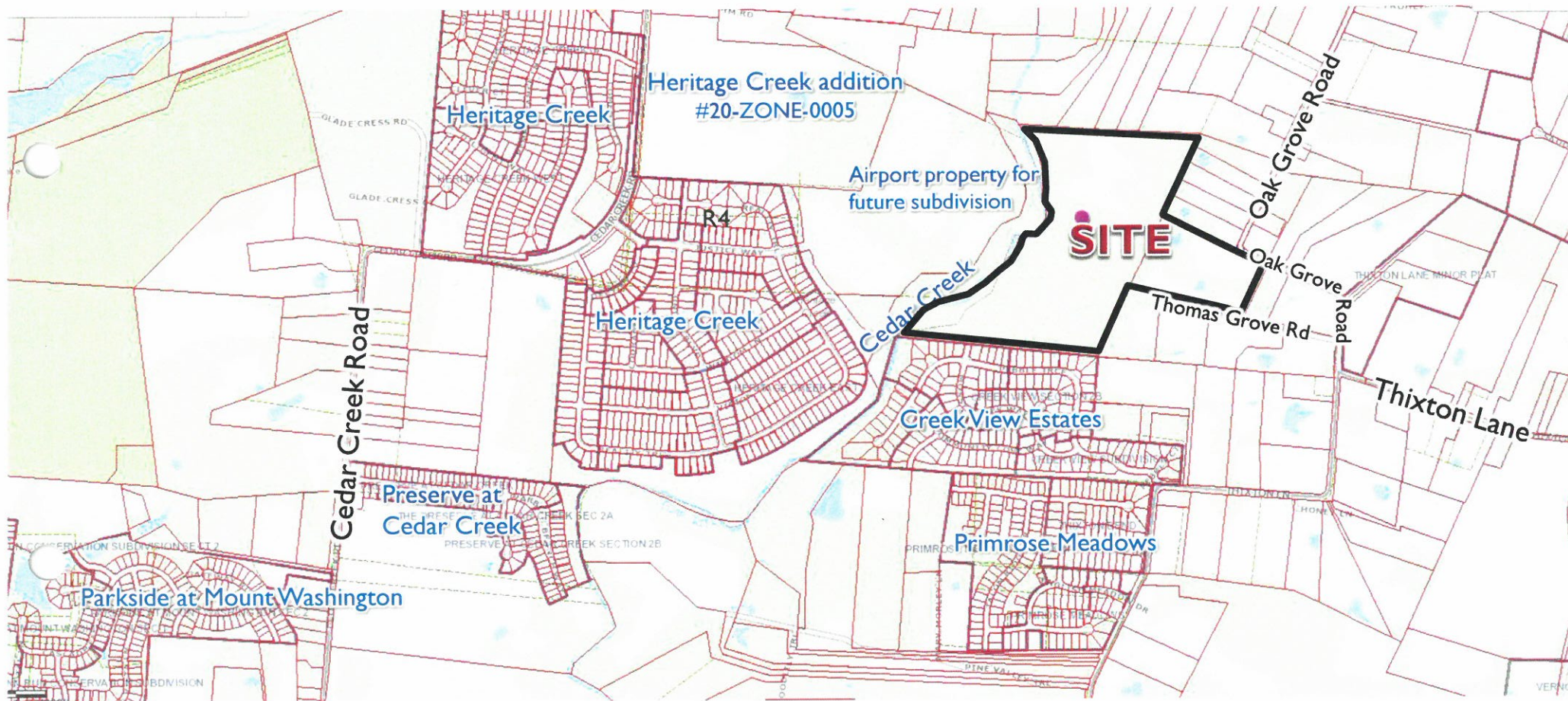
Oak Grove Road

Creek View Estates

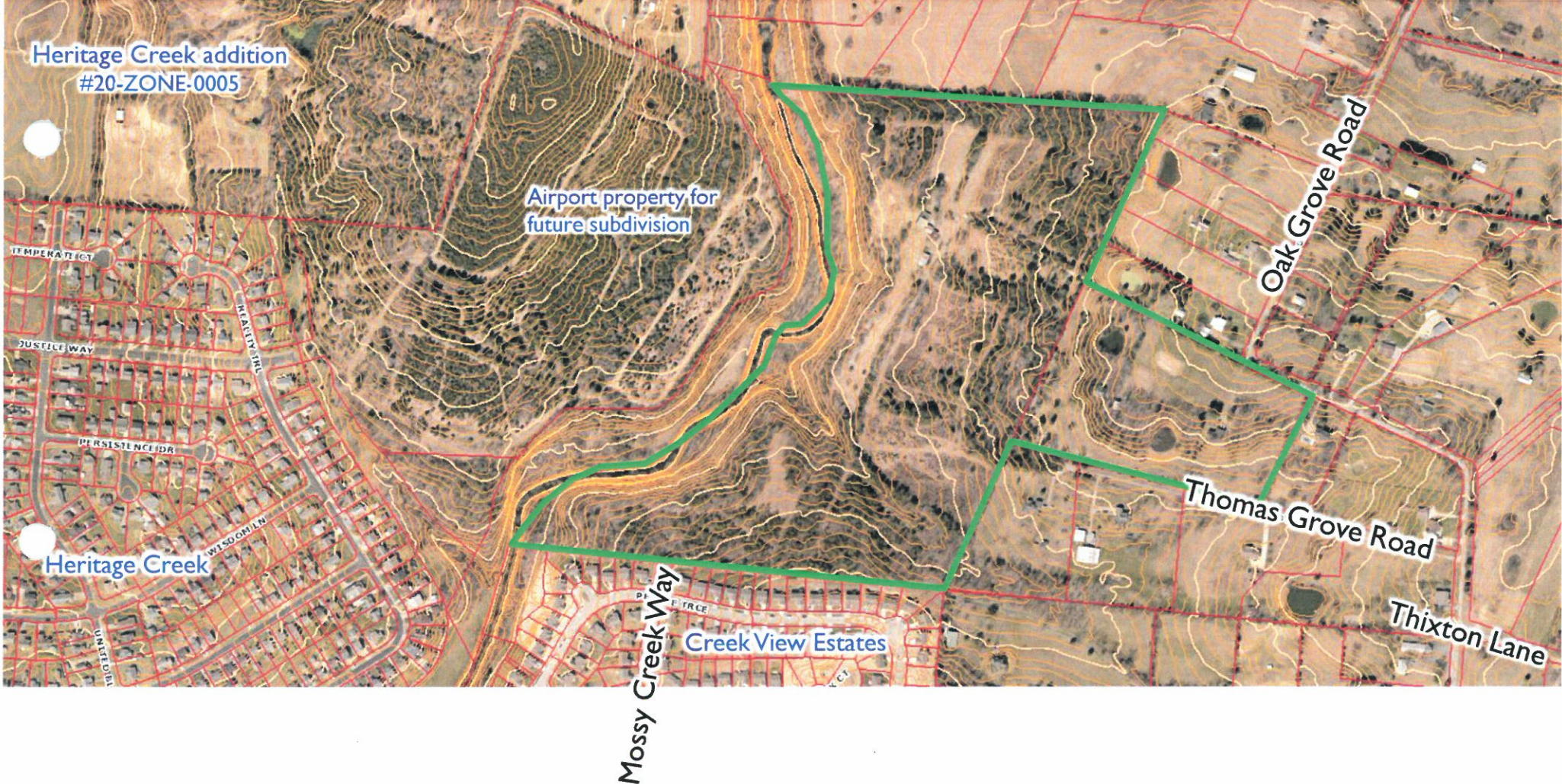
Thixton Lane













Plan shown at the 12/16/21 Planning Commission Hearing  
263 Lot R-4 Density Transfer Subdivision



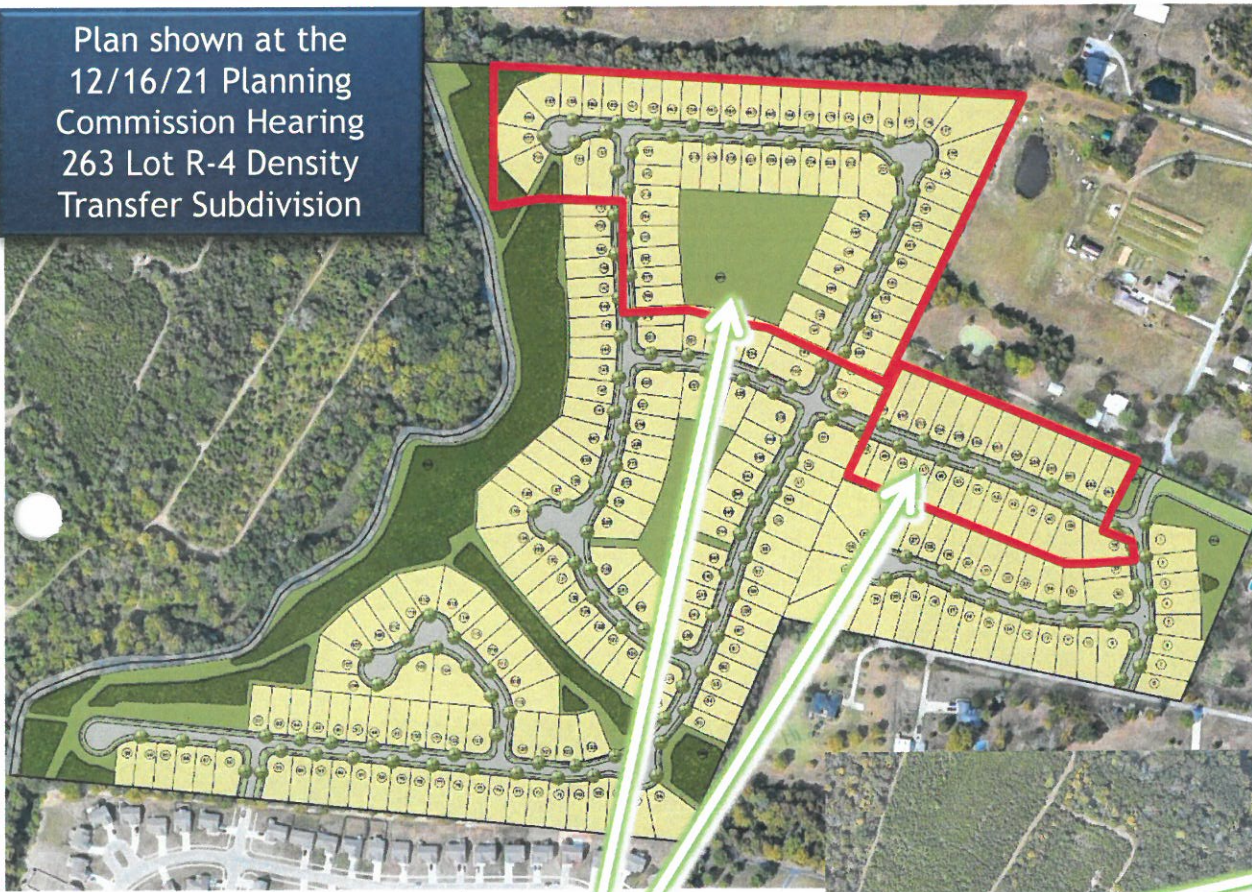


# Proposed subdivision plan





Plan shown at the  
12/16/21 Planning  
Commission Hearing  
263 Lot R-4 Density  
Transfer Subdivision



Proposed plan  
180 Lot R-4 Density Transfer  
Subdivision

Lots removed

Added stub connection





Plan shown at the 12/16/21 Planning Commission Hearing  
263 Lot R-4 Density Transfer Subdivision - possible connection location



## WEST CONNECTION

Stub connection constructed to the 100 ft outer zone of Cedar Creek w/ROW dedication to property line

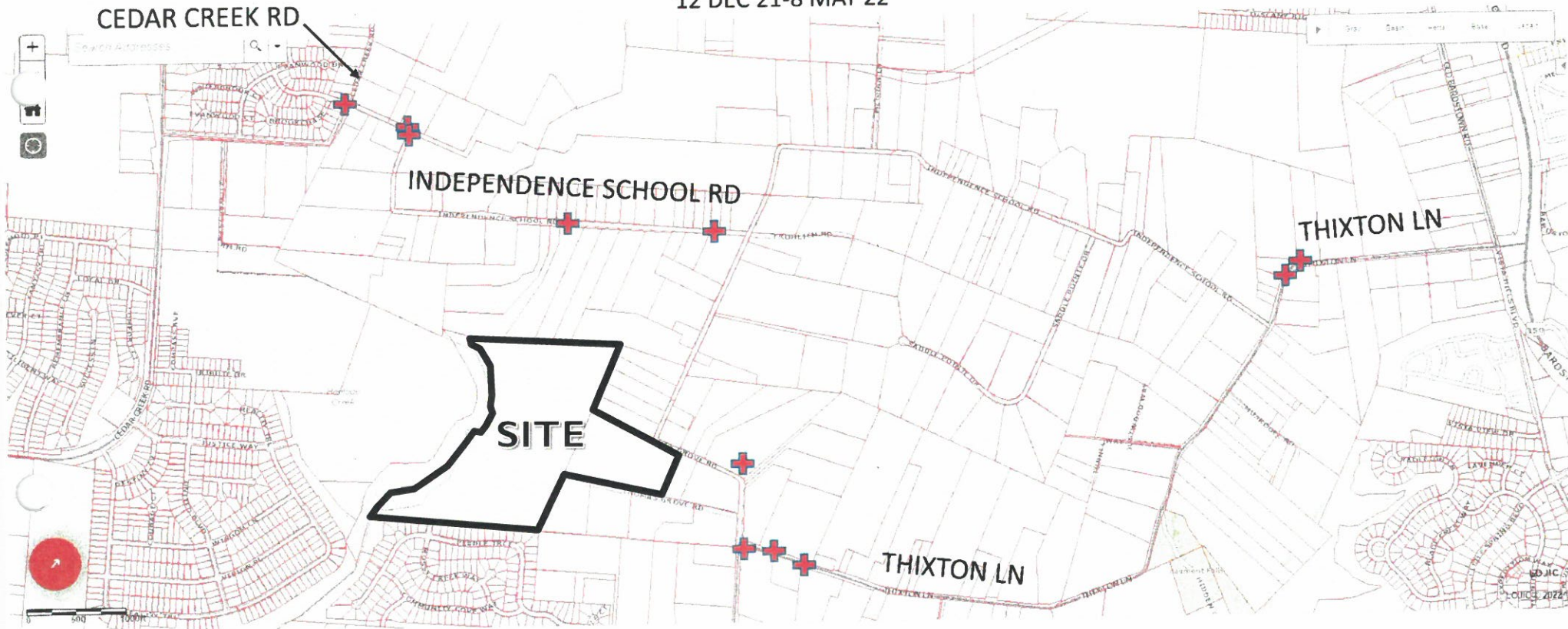
Proposed revised subdivision plan - proposed connection location



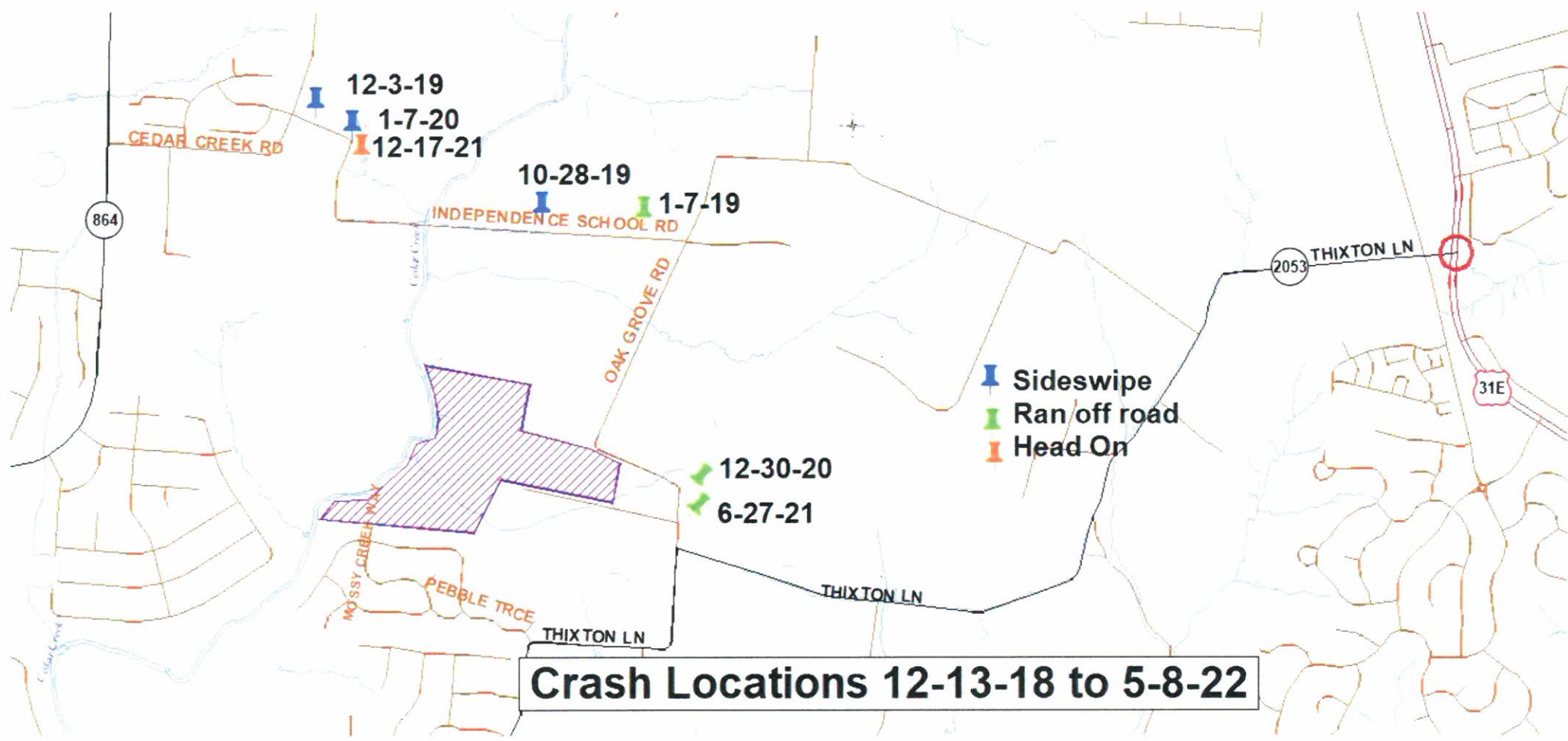


# OAK GROVE INCIDENT OVERVIEW

12 DEC 21-8 MAY 22









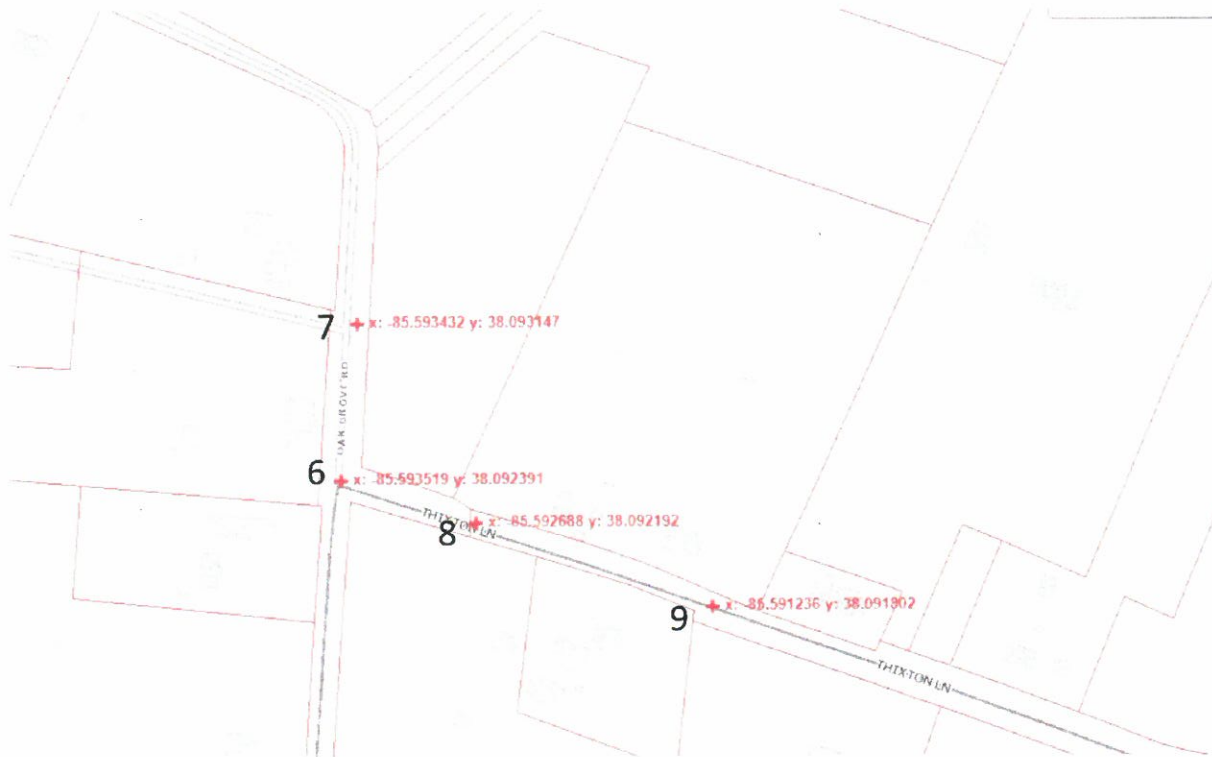
# INDEPENDENCE SCHOOL ROAD



| Event | RoadwayName         | Latitude | Longitude    | Collision Date | Collision Time | Units Involved | Motor Vehicles Involved | Number Killed | Number Injured | Weather | Rdwy Condition Code | Hit and Run | Direction                                               | Manner of Collision          | Rdwy Character       | Light Condition      |
|-------|---------------------|----------|--------------|----------------|----------------|----------------|-------------------------|---------------|----------------|---------|---------------------|-------------|---------------------------------------------------------|------------------------------|----------------------|----------------------|
| 1     | INDEPENDENCE SCHOOL | 38.10467 | -85.60735442 | 12/3/2019      | 2002           | 2              | 2                       | 0             | 0              | CLEAR   | DRY                 | FALSE       | OPPOSITE DIRECTION - BOTH VEHICLES GOING STRAIGHT AHEAD | SIDESWIPE-OPPOSITE DIRECTION | STRAIGHT & HILLCREST | DARK-HWY LIGHTED/OFF |
| 2     | INDEPENDENCE SCHOOL | 38.10382 | -85.60529063 | 1/7/2020       | 1455           | 2              | 2                       | 0             | 0              | CLEAR   | DRY                 | FALSE       | SIDESWIPE COLLISION - OPPOSITE DIRECTION                | SIDESWIPE-OPPOSITE DIRECTION | CURVE & GRADE        | DAYLIGHT             |
| 3     | INDEPENDENCE SCHOOL | 38.10389 | -85.60522909 | 12/17/2021     | 1642           | 2              | 2                       | 0             | 0              | RAINING | WET                 | FALSE       | HEAD-ON COLLISION                                       | HEAD ON                      | CURVE & GRADE        | DUSK                 |
| 4     | INDEPENDENCE SCHOOL | 38.1013  | -85.59955903 | 10/28/2019     | 1647           | 2              | 2                       | 0             | 0              | CLEAR   | DRY                 | FALSE       | SIDESWIPE COLLISION - OPPOSITE DIRECTION                | SIDESWIPE-OPPOSITE DIRECTION | STRAIGHT & LEVEL     | DAYLIGHT             |
| 5     | INDEPENDENCE SCHOOL | 38.1011  | -85.59409595 | 1/7/2019       | 0933           | 1              | 1                       | 0             | 0              | CLOUDY  | DRY                 | FALSE       | OTHER COLLISIONS ON SHOULDER                            | SINGLE VEHICLE               | STRAIGHT & LEVEL     | DAYLIGHT             |



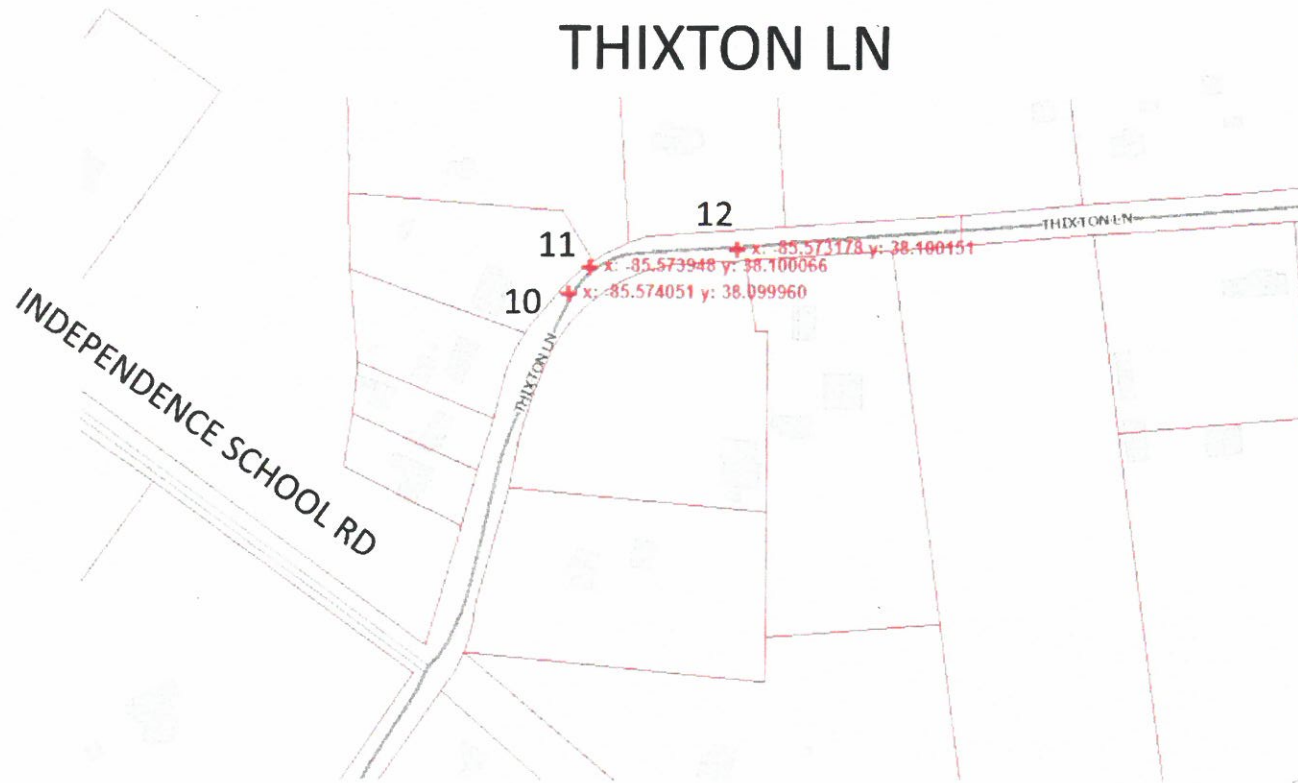
# OAK GROVE RD & THIXTON LN



| Event | RoadwayName | Latitude | Longitude    | Collision Date | Collision Time | Units Involved | Motor Vehicles Involved | Number Killed | Number Injured | Weather | Rdwy Condition Code | Hit and Run | Direction                                                    | Manner of Collision      | Rdwy Character   | Light Condition      |
|-------|-------------|----------|--------------|----------------|----------------|----------------|-------------------------|---------------|----------------|---------|---------------------|-------------|--------------------------------------------------------------|--------------------------|------------------|----------------------|
| 6     | OAK GROVE   | 38.09239 | -85.59351963 | 12/31/2020     | 0720           | 1              | 1                       | 0             | 0              | CLOUDY  | WET                 | FALSE       | COLLISION WITH FIXED OBJECT NON - INTERSECTION - FIRST EVENT | SINGLE VEHICLE           | STRAIGHT & LEVEL | DARK-HWY LIGHTED/OFF |
| 7     | OAK GROVE   | 38.09315 | -85.59343312 | 6/27/2021      | 0519           | 1              | 1                       | 0             | 0              | CLEAR   | DRY                 | FALSE       | COLLISION WITH FIXED OBJECT IN INTERSECTION - FIRST EVENT CO | SINGLE VEHICLE           | STRAIGHT & GRADE | DARK-HWY NOT LIGHTED |
| 8     | THIXTON     | 38.09219 | -85.59268699 | 8/6/2019       | 1733           | 2              | 2                       | 0             | 0              | CLEAR   | DRY                 | FALSE       | SIDESWIPE COLLISION - SAME DIRECTION                         | SIDESWIPE-SAME DIRECTION | STRAIGHT & LEVEL | DAYLIGHT             |
| 9     | THIXTON     | 38.0918  | -85.5912368  | 11/8/2019      | 1700           | 1              | 1                       | 0             | 0              | CLEAR   | DRY                 | FALSE       | OTHER ROADWAY OR MID-BLOCK COLLISION                         | SINGLE VEHICLE           | STRAIGHT & LEVEL | DAYLIGHT             |



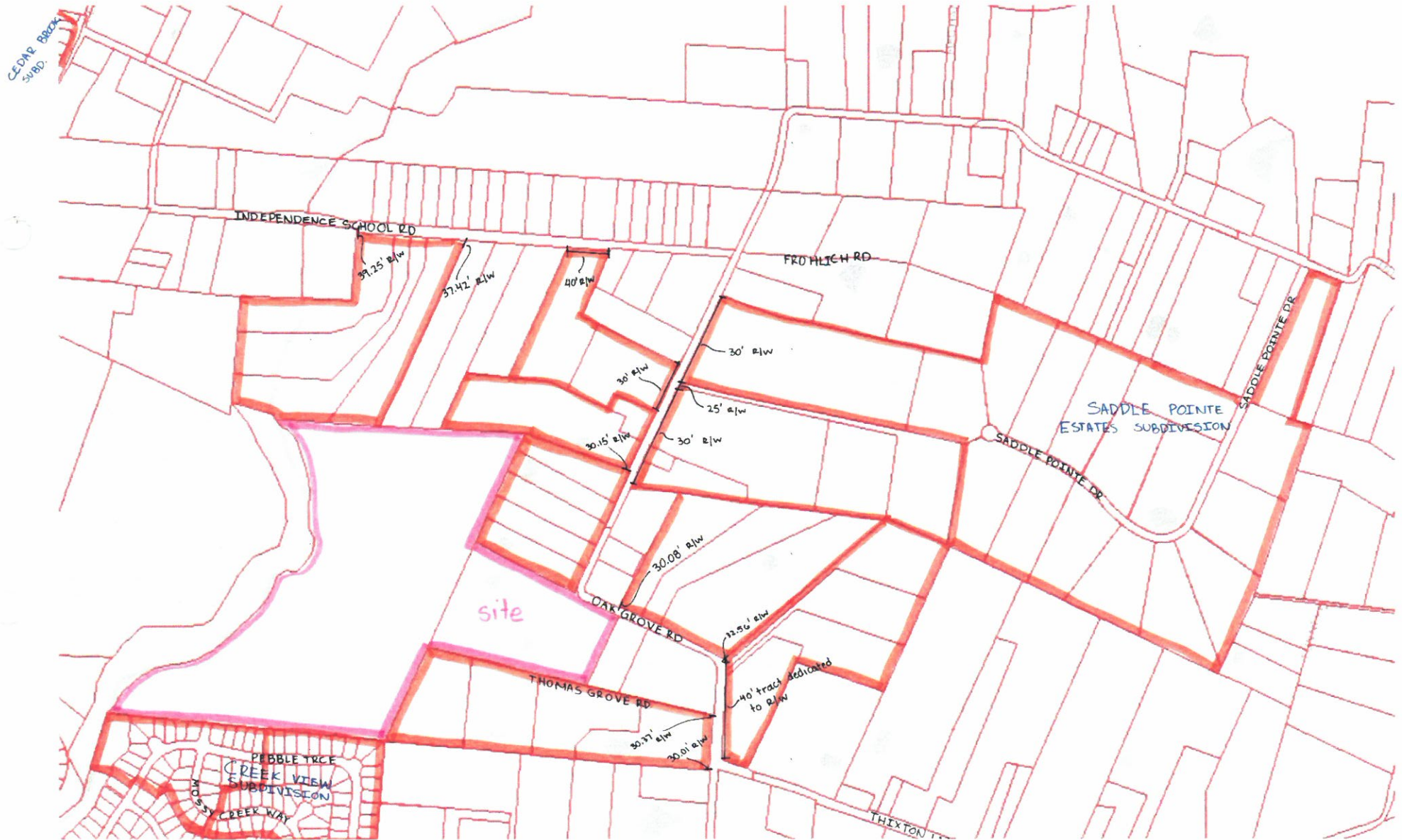
# INDEPENDENCE SCHOOL RD & THIXTON LN



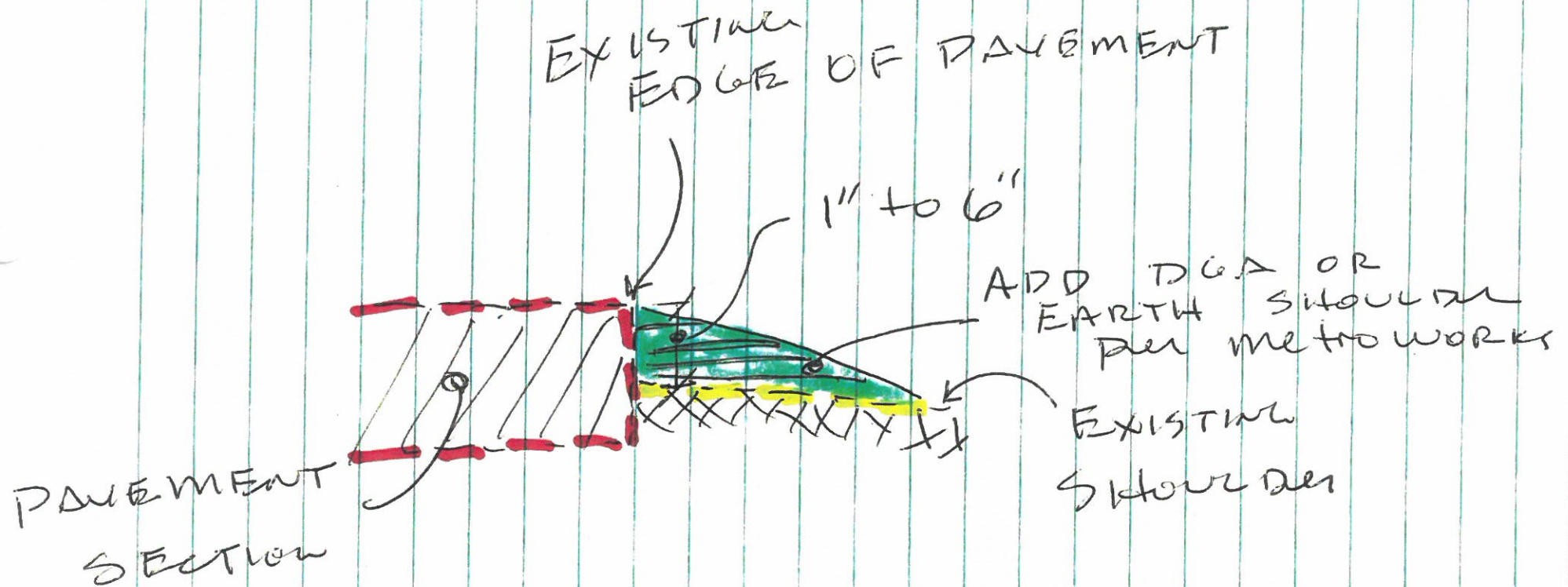
| Event | RoadwayName | Latitude | Longitude    | Collision Date | Collision Time | Units Involved | Motor Vehicles Involved | Number Killed | Number Injured | Weather | Rdwy Condition Code | Hit and Run | Direction                                | Manner of Collision          | Rdwy Character | Light Condition |
|-------|-------------|----------|--------------|----------------|----------------|----------------|-------------------------|---------------|----------------|---------|---------------------|-------------|------------------------------------------|------------------------------|----------------|-----------------|
| 10    | THIXTON     | 38.09996 | -85.57405058 | 7/7/2019       | 1448           | 2              | 2                       | 0             | 0              | RAINING | WET                 | FALSE       | SIDESWIPE COLLISION - OPPOSITE DIRECTION | SIDESWIPE-OPPOSITE DIRECTION | CURVE & LEVEL  | DAYLIGHT        |
| 11    | THIXTON     | 38.10007 | -85.57394716 | 6/7/2019       | 1400           | 2              | 2                       | 0             | 0              | RAINING | WET                 | FALSE       | SIDESWIPE COLLISION - OPPOSITE DIRECTION | SIDESWIPE-OPPOSITE DIRECTION | CURVE & LEVEL  | DAYLIGHT        |
| 12    | THIXTON     | 38.10015 | -85.57317664 | 6/16/2019      | 0708           | 2              | 2                       | 0             | 0              | RAINING | WET                 | FALSE       | SIDESWIPE COLLISION - SAME DIRECTION     | SIDESWIPE-SAME DIRECTION     | CURVE & LEVEL  | DAYLIGHT        |



# Oak Grove Right-of-Way





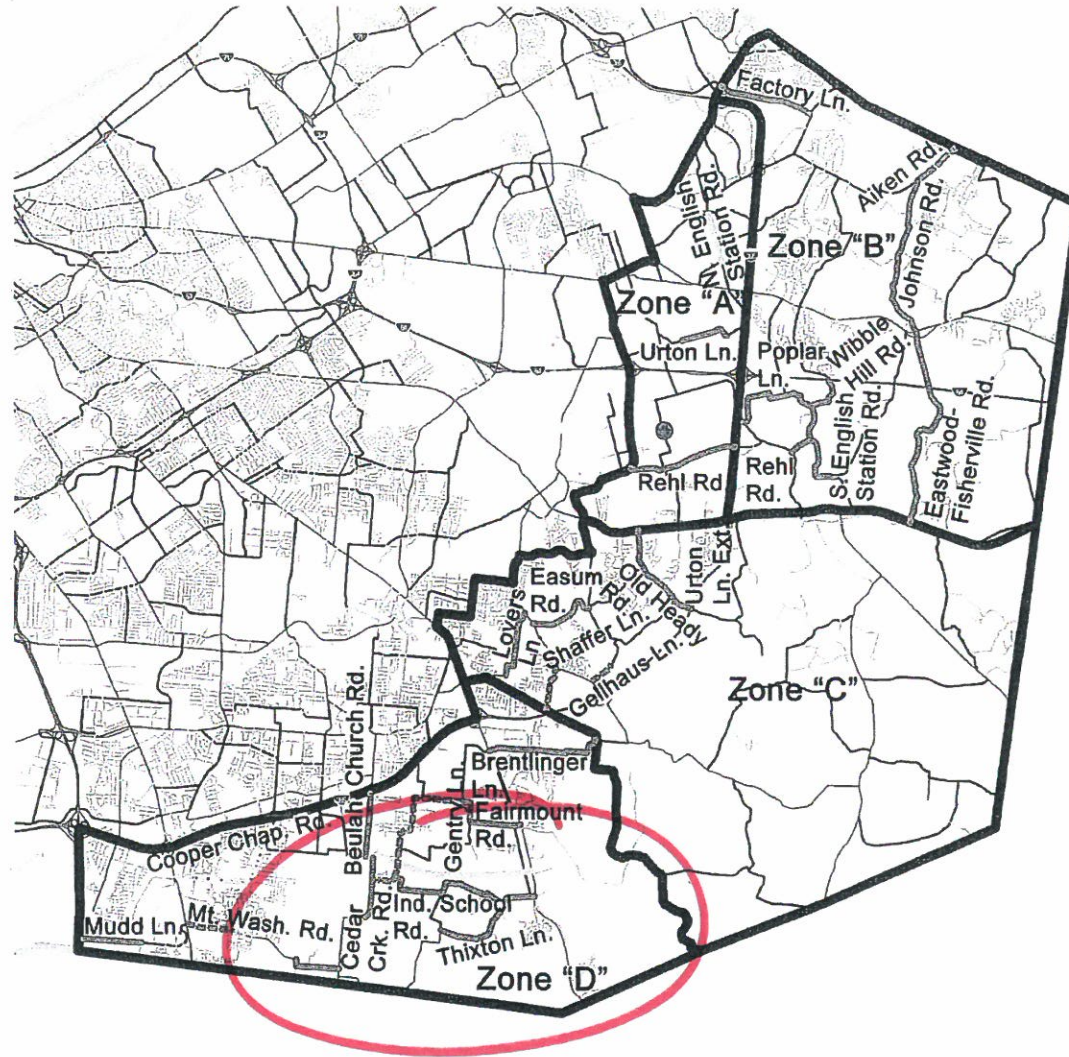


~~SHOULDER~~  
SHOULDER IMPROVEMENT





## DESIGNATED ROADS



Copyright (c) 2004, LOUISVILLE AND JEFFERSON  
COUNTY METROPOLITAN SEWER DISTRICT (MSD),  
LOUISVILLE WATER COMPANY (LWC) and  
LOUISVILLE METRO GOVERNMENT  
All Rights Reserved





System Development Designated Roads  
Status as of December 31, 2019

|                                                      | Miles        | Status                            |
|------------------------------------------------------|--------------|-----------------------------------|
| <b>Zone A</b>                                        |              |                                   |
| Rehl Road - Blankenbaker Pkwy to I-265               | 1.3          | Not Started                       |
| Tucker Station Road - Bridge Replacement             |              | Complete                          |
| Urton Lane ( N Pope Lick Rd. To Urton Lane Extension | <u>0.85</u>  | Complete                          |
|                                                      | <b>2.15</b>  |                                   |
| Designated Corridor Project                          |              |                                   |
| North English Station Road Aiken Rd. to Old Henry    | 0.85         | Pending - to be completed by KYTC |
| 80/20 Local Match                                    | <u>0.85</u>  |                                   |
|                                                      | <b>3</b>     |                                   |
| <b>Zone Percentage by Milage</b>                     | <b>7.02%</b> |                                   |

|                                                        |      |             |
|--------------------------------------------------------|------|-------------|
| <b>Zone B</b>                                          |      |             |
| Aiken Road (Johnson Road to Co. Line)                  | 0.85 | Complete    |
| Eastwood-Fisherville Road (US 60 to Taylorsville Road) | 3.49 | Complete    |
| Eastwood-Fisherville Road (Railroad Underpass)         |      | Not Started |
| Factory Lane (LaGrange Rd. to Old Henry Rd.)           |      |             |
| Johnson Road (Shelbyville Rd. to Aiken Rd.)            |      |             |
| Poplar Lane (S. Pope Lick Rd. to S. English Station    |      |             |
| Rehl Road (S. Pope Lick Rd. to S. English Station R    |      |             |
| South English Station Road (Poplar Lane to Echo T      |      |             |
| Wibble Hill Road (S. English Station Rd. to I64)       |      |             |

Breckley Station Road - Added by Committee  
Aiken & Bush Farm Rd Intersection - Added by Co  
N English Station Rd Intersection - Added by Com

**Zone C**  
Easum Road (Billtown Rd. to Cheoweth Run Rd.)  
Gelhaus Lane (Bus Compound Improvements)  
Lovers Lane (Seatonville Rd. to Billtown Rd.)  
Old Heady Road (I-265 to Taylorsville Rd.)  
Shaffer Lane (Seatonville Rd. to Billtown Rd.)  
Urton lane Ext.: Lovers Lane to Billtown Road (R/  
Urton lane Ext.: Old Heady Rd. to Taylorsville Rd.

**Zone D**

|                                                           |             |             |
|-----------------------------------------------------------|-------------|-------------|
| Beulah Church Road (I-265 to Heritage Creek)              | 2           | Complete    |
| Brentlinger Lane (Bardstown Rd. to Seatonville Rd.)       | 1.9         | Complete    |
| Fairmount Road (Bardstown Rd. to Seatonville Rd.)         | 0.71        | Complete    |
| Gentry Lane (Fairmount Rd. to Cedar Creek Rd.)            | 0.46        | Complete    |
| Independence School Road (Cedar Creek Rd. to Thixton Ln.) | 2.23        | Complete    |
| Mt. Washington Road (90 degree bend to Cedar Creek Rd)    | 0.01        | Complete    |
| Mt. Washington Road (Preston Hwy to Waycross Dr)          | 0.79        | Complete    |
| Mudd Lane (Blue Lick Rd. to Cody Lane)                    | 1           | Not Started |
| Thixton Lane (Bardstown Road to Oak Grove Road)           | 1.88        | Complete    |
| Cedar Creek Rd (Beulah Church Rd to Gentry Ln)            | <u>2.61</u> | Complete    |

**13.59**

|                                                           |             |             |
|-----------------------------------------------------------|-------------|-------------|
| <b>Zone D</b>                                             |             |             |
| Beulah Church Road (I-265 to Heritage Creek)              | 2           | Complete    |
| Brentlinger Lane (Bardstown Rd. to Seatonville Rd.)       | 1.9         | Complete    |
| Fairmount Road (Bardstown Rd. to Seatonville Rd.)         | 0.71        | Complete    |
| Gentry Lane (Fairmount Rd. to Cedar Creek Rd.)            | 0.46        | Complete    |
| Independence School Road (Cedar Creek Rd. to Thixton Ln.) | 2.23        | Complete    |
| Mt. Washington Road (90 degree bend to Cedar Creek Rd)    | 0.01        | Complete    |
| Mt. Washington Road (Preston Hwy to Waycross Dr)          | 0.79        | Complete    |
| Mudd Lane (Blue Lick Rd. to Cody Lane)                    | 1           | Not Started |
| Thixton Lane (Bardstown Road to Oak Grove Road)           | 1.88        | Complete    |
| Cedar Creek Rd (Beulah Church Rd to Gentry Ln)            | <u>2.61</u> | Complete    |

**13.59**

|                                                             |             |                        |
|-------------------------------------------------------------|-------------|------------------------|
| Designated Corridor Project                                 |             |                        |
| Cooper Chapel Road Phase 1 - Preston Hwy to Smyrna Rd.      | 1.85        | Substantially Complete |
| 80/20 Local Match                                           |             |                        |
| Cooper Chapel Road Phase 3 - Beulah Church to Old Bardstown | <u>2.6</u>  | Design                 |
| 80/20 Local Match                                           | <u>4.45</u> |                        |

**Zone Percentage by Milage** **42.23%** **18.04**

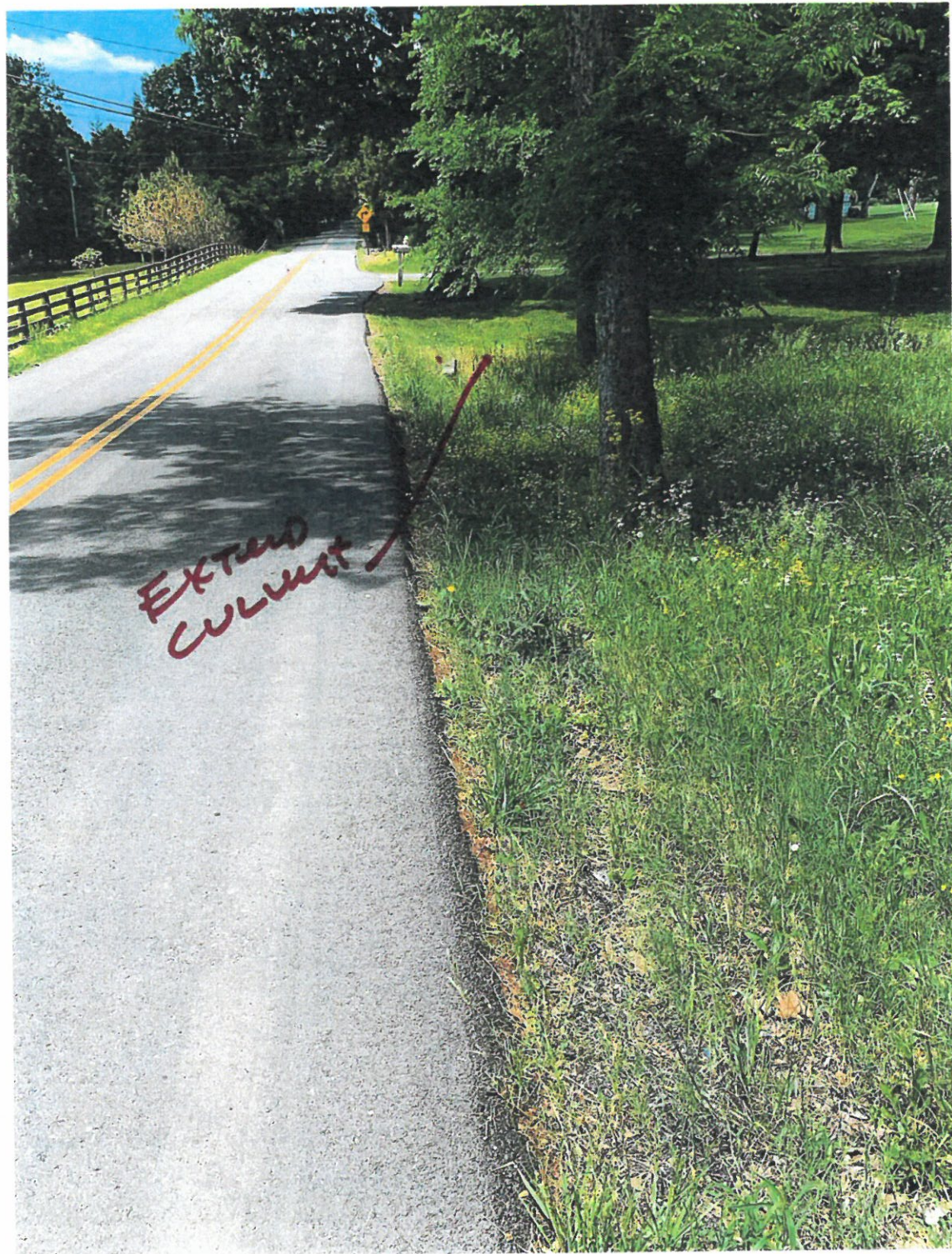
Total Miles **42.72**

Funds encumbered from bond issued to support system development projects: \$320,407  
Funds remaining from bond issued to support system development projects: \$1,801,098





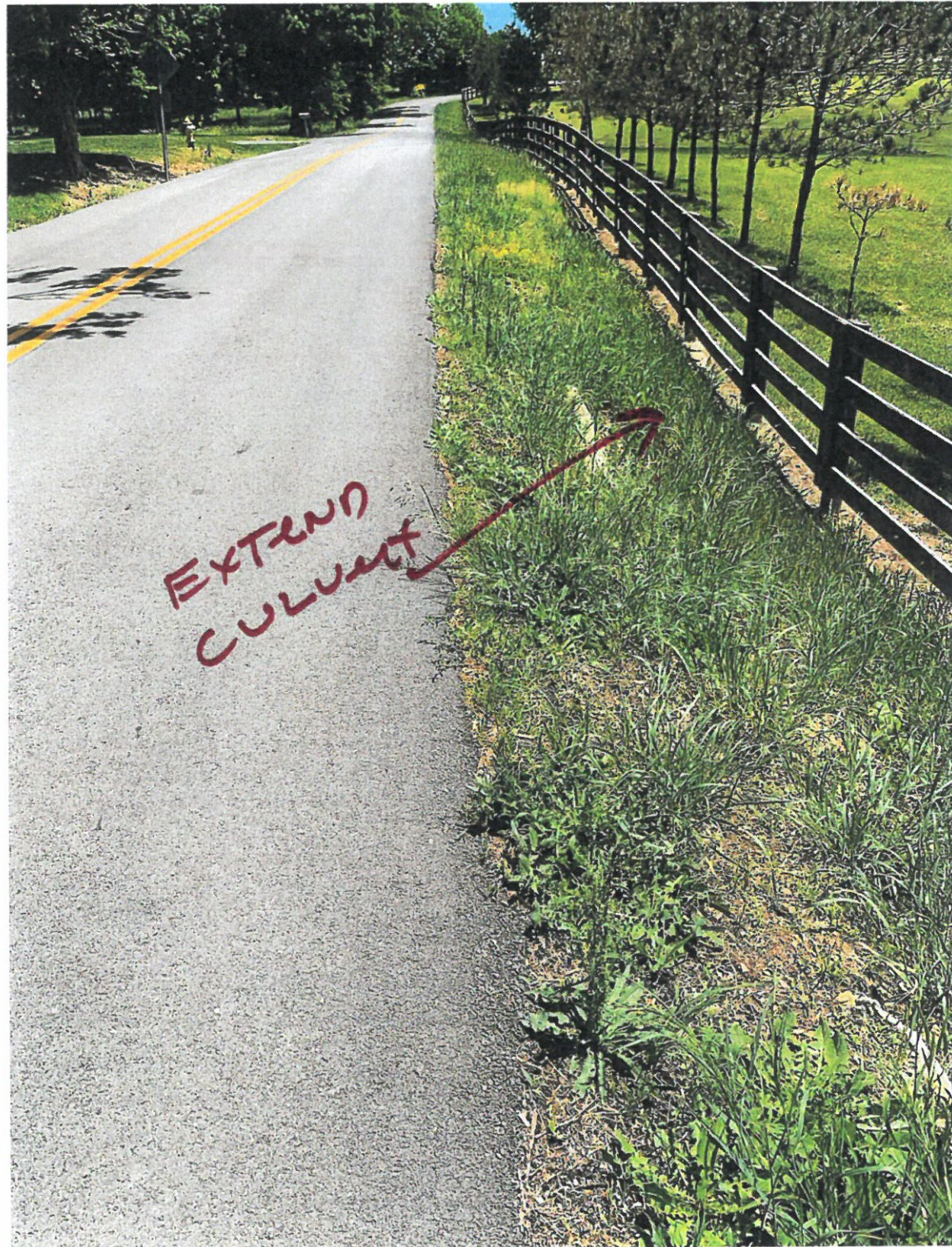










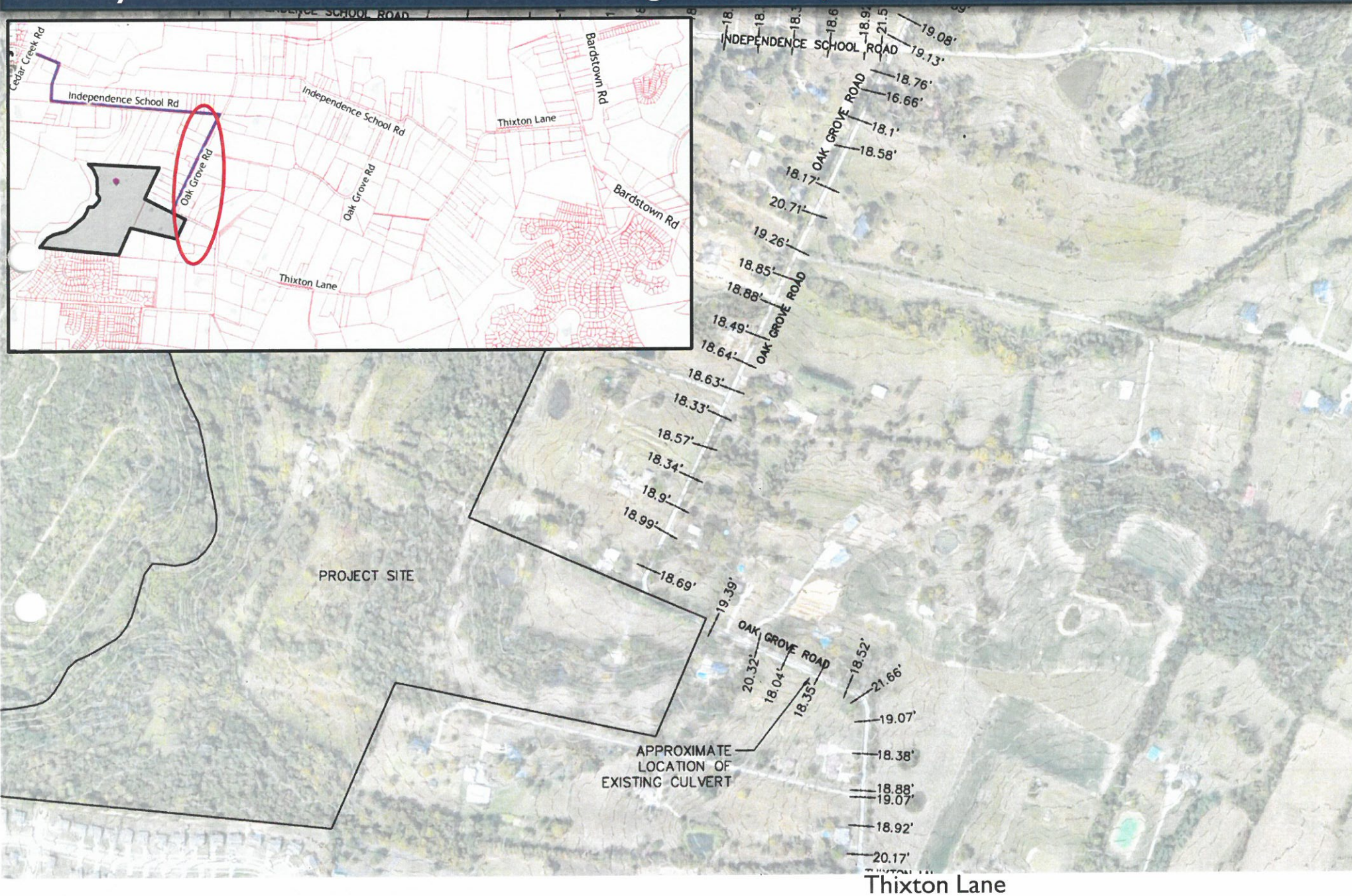






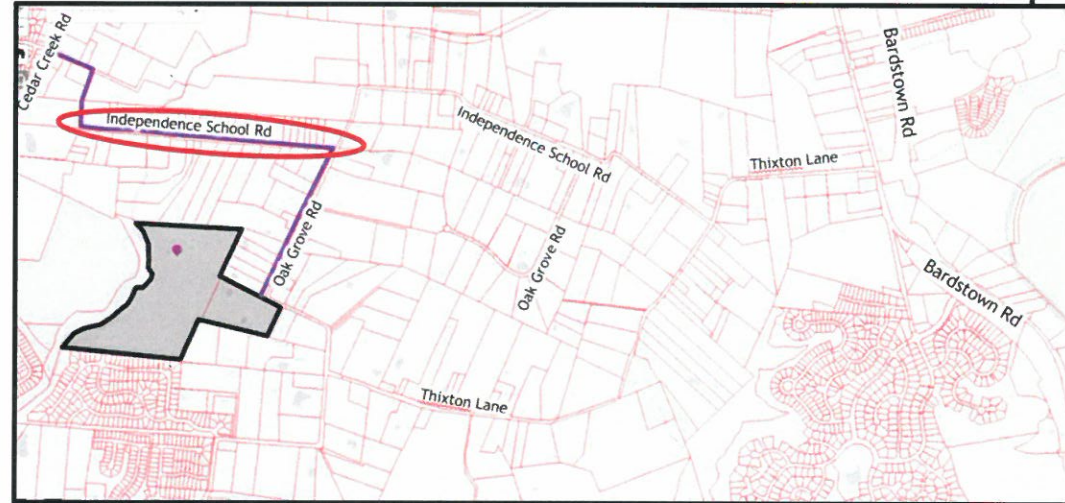


# Survey of Oak Grove Road Existing Roadway Width



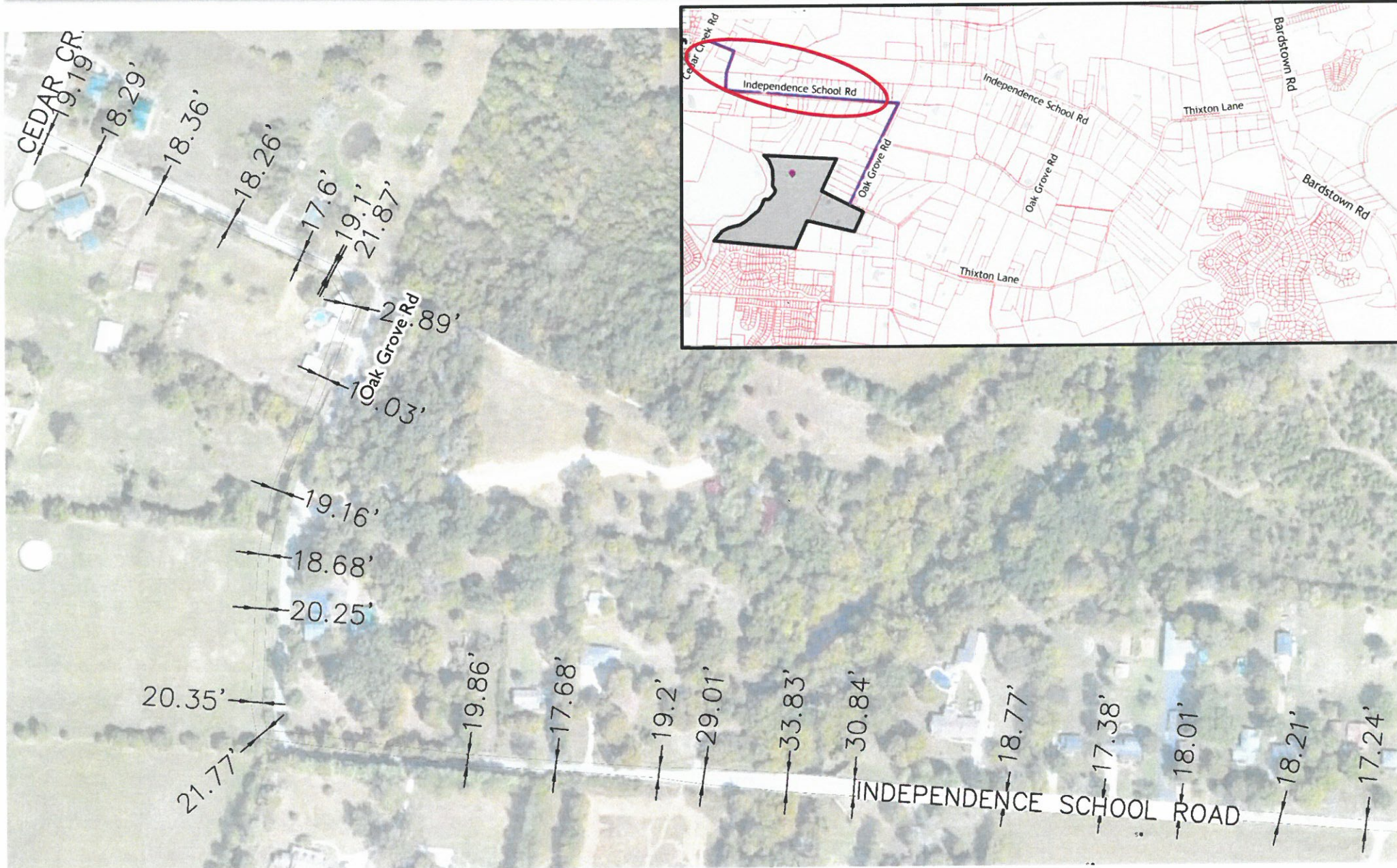


# Survey of Independence School Road existing roadway width – Developer to improve to minimum 18 ft width from Cedar Creek Road to Oak Grove Road





# Survey of Independence School Road Existing Roadway Width – Developer to improve to minimum 18 ft width



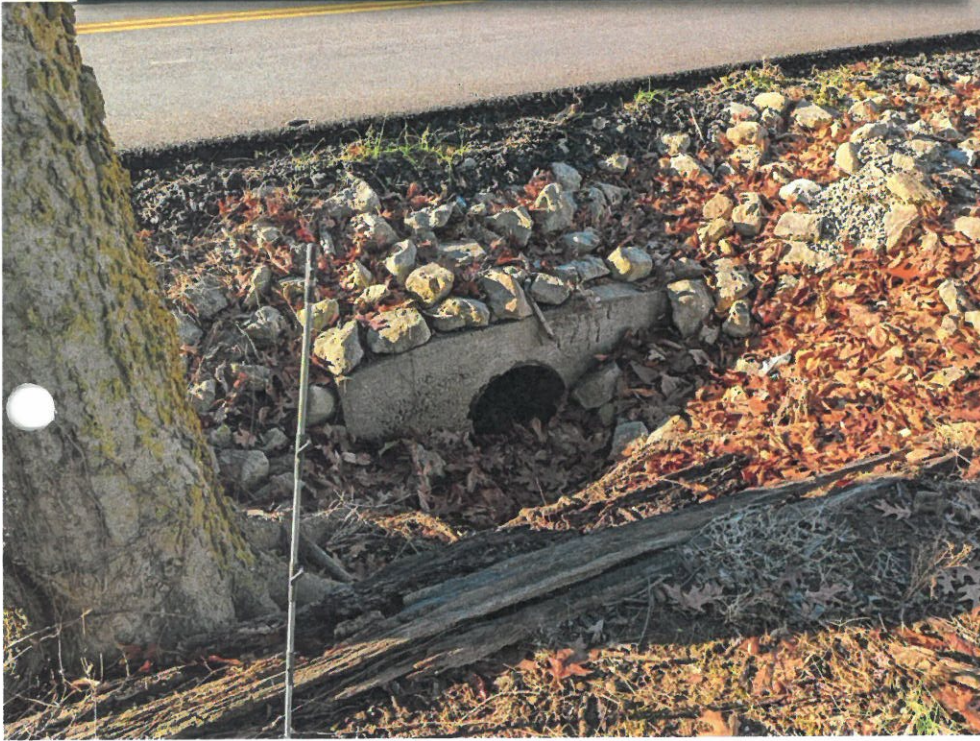


Headwalls on Oak Grove Road - Developer to construct safety improvements including new headwall, guardrails or shoulder improvements as requested by Louisville Metro Public Works to address the headwalls shown at the 12/16/21 Planning Commission public hearing



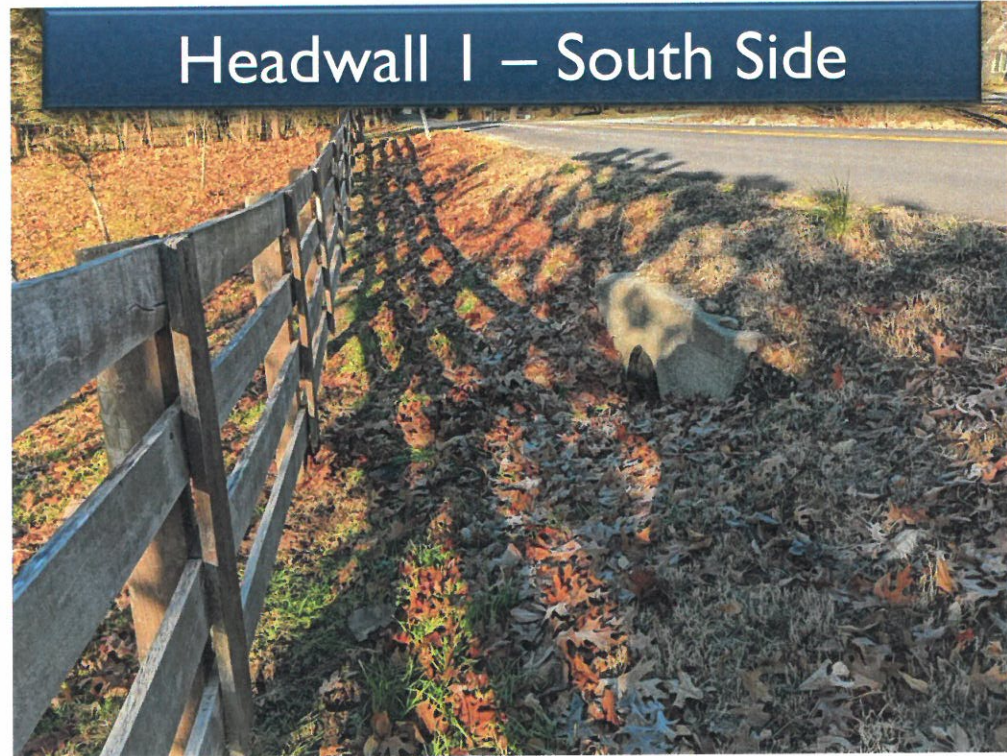


## Headwall I – North Side



Developer to construct safety improvements including new headwall, guardrails or shoulder improvements as requested by Louisville Metro Public Works to address the headwalls shown at the 12/16/21 Planning Commission public hearing

## Headwall I – South Side



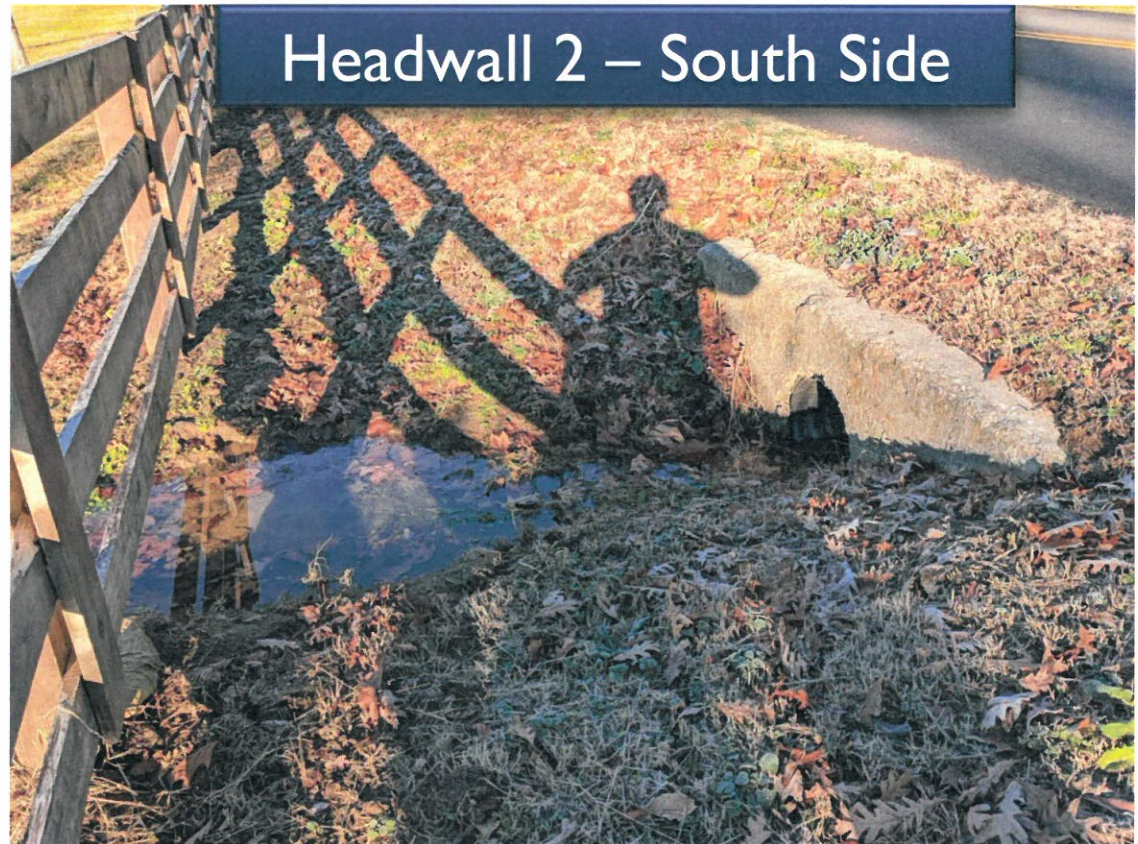


## Headwall 2 – North Side



Developer to construct safety improvements including new headwall, guardrails or shoulder improvements as requested by Louisville Metro Public Works to address the headwalls shown at the 12/16/21 Planning Commission public hearing

## Headwall 2 – South Side





# Karst Survey – Sinkhole location map

○ = SINKHOLE



|                          |                        |     |
|--------------------------|------------------------|-----|
| 4-FOR APPROPRIATE ACTION | 10-REJECTED            | 15- |
| 5-FOR SIGNATURE & RETURN | 11-NO EXCEPTIONS TAKEN | 16- |
| 6-AS REQUESTED           | 12-NOTE MARKINGS       | 17- |
|                          |                        | 18- |

REMARKS Mindel Scott professional engineer, Travis Brown, conducted online research to assess karst potential at the project site. The Kentucky Geologic Map service online characterizes the site as being karst prone to intense karst potential, with no mapped sinkholes on the site but many in the project vicinity.

The engineer visited the site on September 1, 2021 to perform a visual inspection and site walk. Upon walking the site the engineer encountered numerous sinkholes and other potentially karstic features on the site. Their approximate locations are noted on the attached location map. It should be noted that much of the ground was invisible or inaccessible at the time of inspection due to dense vegetation. It is likely to encounter these sinkholes other features during earthwork for the proposed construction. It is recommended to retain geotechnical services during construction to call if sinkholes are encountered. Care should be taken during earthwork to investigate and properly remediate potential sinkholes, per the geotechnical engineer's recommendations. It will be important to proofroll thoroughly before placing fill and after cutting.

COPIES TO: \_\_\_\_\_

SENT BY: Thank you,  
Travis Brown  
Travis A. Brown, PE







# final report

May 9, 2022

## Traffic Impact Study

Oak Grove Subdivision  
10212 Oak Grove Road  
Louisville, KY

Prepared for

Louisville Metro Planning Commission



DIANE B. ZIMMERMAN  
Traffic Engineering, LLC

12803 High Meadows Place  
Parsippany, NJ 07054  
908.546.1800  
dzimmer@trafficeng.net





|                                       | A.M.                    |                         |                         | P.M.                    |                         |                         |
|---------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Approach                              | 2021<br>Existing        | 2027<br>No Build        | 2027<br>Build           | 2021<br>Existing        | 2027<br>No Build        | 2027<br>Build           |
| <b>Bardstown Road at Thixton Lane</b> | <b>B</b><br><b>14.9</b> | <b>B</b><br><b>16.0</b> | <b>B</b><br><b>14.9</b> | <b>C</b><br><b>29.3</b> | <b>C</b><br><b>32.4</b> | <b>D</b><br><b>42.7</b> |
| Thixton Lane Eastbound                | D<br>43.3               | D<br>44.4               | E<br>68.4               | E<br>64.8               | E<br>69.1               | E<br>67.3               |
| Bardstown Road Northbound             | B<br>12.3               | B<br>13.4               | A<br>9.9                | B<br>13.7               | B<br>16.2               | B<br>19.9               |
| Bardstown Road Southbound             | B<br>15.4               | B<br>16.3               | B<br>13.0               | C<br>32.6               | D<br>35.4               | D<br>51.3               |

Key: Level of Service, Delay in seconds per vehicle

**Table 3. Bardstown Road at Thixton Lane with a right turn lane on Thixton Lane**

|                                       | A.M.                    |                                   | P.M.                    |                                   |
|---------------------------------------|-------------------------|-----------------------------------|-------------------------|-----------------------------------|
| Approach                              | 2027<br>Build           | 2027<br>Build<br>Thixton Ln Right | 2027<br>Build           | 2027<br>Build<br>Thixton Ln Right |
| <b>Bardstown Road at Thixton Lane</b> | <b>B</b><br><b>14.9</b> | <b>B</b><br><b>10.7</b>           | <b>D</b><br><b>42.7</b> | <b>C</b><br><b>23.5</b>           |
| Thixton Lane Eastbound                | E<br>68.4               | D<br>52.0                         | E<br>67.3               | E<br>64.7                         |
| Bardstown Road Northbound             | A<br>9.9                | A<br>6.7                          | B<br>19.9               | B<br>11.9                         |
| Bardstown Road Southbound             | B<br>13.0               | A<br>9.4                          | D<br>51.3               | C<br>22.6                         |





Current view of Oak Grove Road



# PROPOSED ADDITIONAL BINDING ELEMENTS

- ❑ Developer to construct a right-hand turn lane on eastbound Thixton Lane between the west side of Old Bardstown Road to the east side of New Bardstown Road, per details from the Kentucky Transportation Cabinet.
- ❑ Developer to widen Oak Grove Road from the subject site north to Independence School Road, and Independence School Road from Oak Grove Road to Cedar Creek Road to 18' width where deficient.
- ❑ Developer to widen Independence School Road from Oak Grove Road to Thixton Lane, and Thixton Lane east to Bardstown Road to 18' width where deficient.
- ❑ Developer to construct safety improvements including new headwall, guardrails or shoulder improvements as requested by Louisville Metro Public Works to address the headwalls shown at the \_\_\_\_\_ Planning Commission public hearing.
- ❑ All property owners within 500 feet of a proposed blasting location shall be notified 30 days before any blasting operations occur and be offered pre-blast surveys. Any homeowners who opt to have a pre-blast survey conducted shall be provided copies of all materials resulting from that survey, including any photos and/or videos. Any blast survey shall be done in a manner consistent with Kentucky Blasting regulations.
- ❑ Covenants, Conditions and Restrictions shall include a notice that the stub streets could potentially become connections.

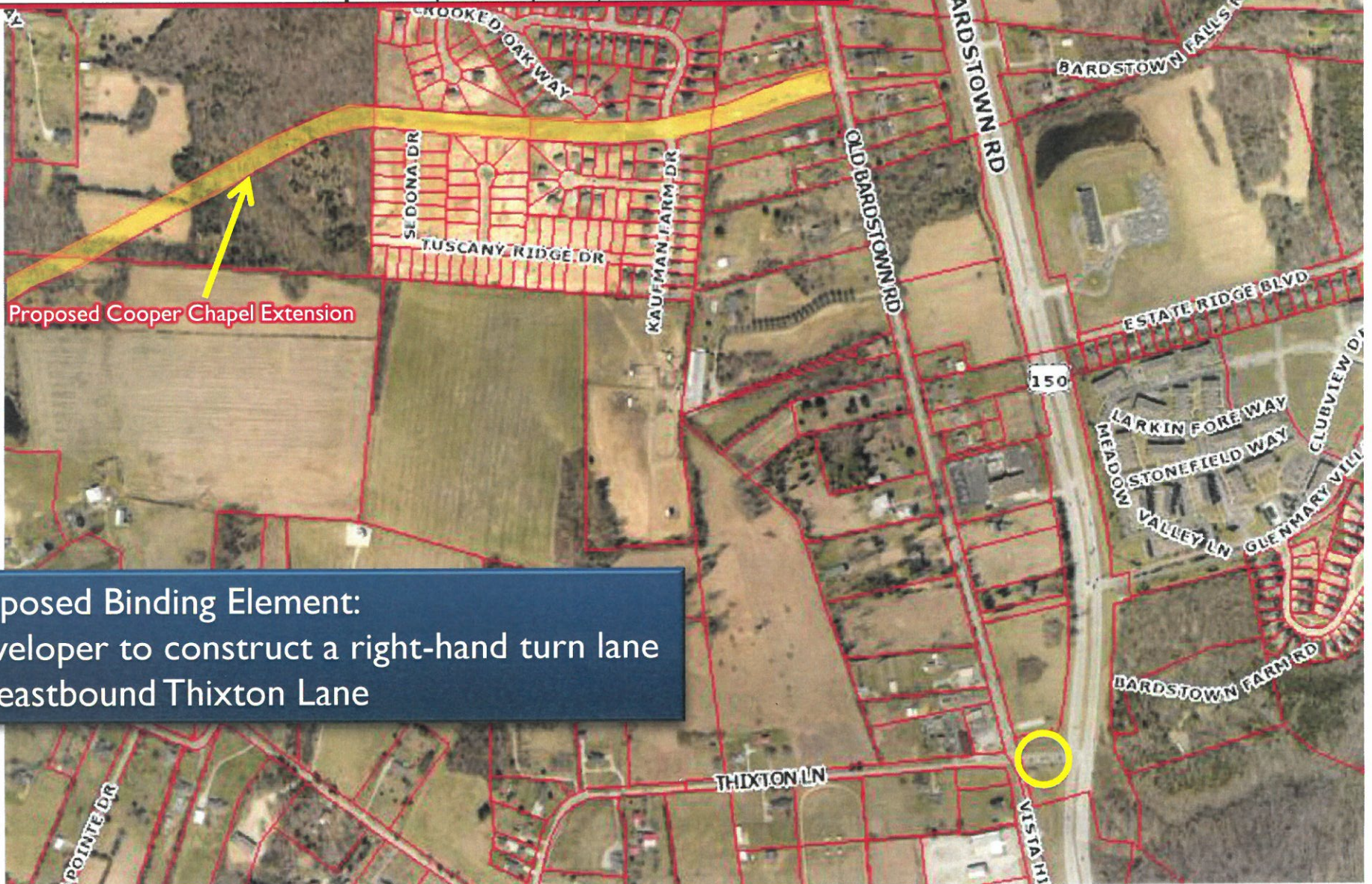


**Thixton Lane at Pebble Trace**

|                         |          |          |           |           |           |           |
|-------------------------|----------|----------|-----------|-----------|-----------|-----------|
| Thixton Lane Eastbound  | A<br>7.4 | A<br>7.5 | A<br>7.5  | A<br>7.6  | A<br>7.7  | A<br>7.8  |
| Pebble Trace Southbound | A<br>9.7 | A<br>9.8 | B<br>10.4 | B<br>10.4 | B<br>10.6 | B<br>11.5 |

**Bardstown Road at Thixton Lane**

|                        |                   |                   |                   |                   |                   |                   |
|------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Thixton Lane Eastbound | <b>B<br/>14.9</b> | <b>B<br/>16.0</b> | <b>B<br/>14.9</b> | <b>C<br/>29.3</b> | <b>C<br/>32.4</b> | <b>D<br/>42.7</b> |
| Thixton Lane Eastbound | D<br>43.3         | D<br>44.4         | E<br>68.4         | E<br>64.8         | E<br>69.1         | E<br>67.3         |



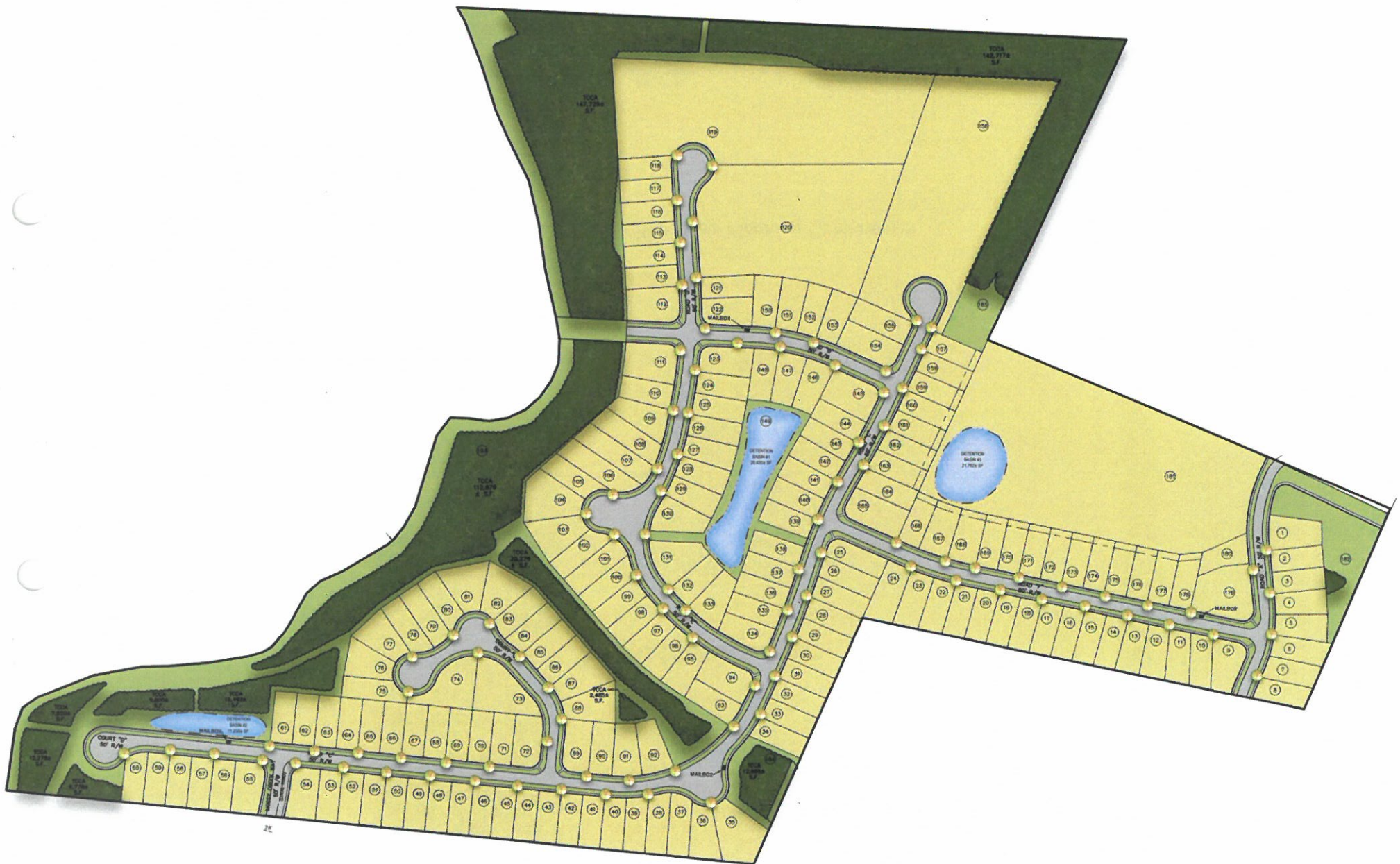
**Proposed Binding Element:**  
Developer to construct a right-hand turn lane  
on eastbound Thixton Lane



|                              | Previous Plan | Revised Plan                 | Difference |
|------------------------------|---------------|------------------------------|------------|
| Tree Canopy Required (S.F.)  | 1,194,764     | 1,194,764                    | 0          |
| Tree Canopy Preserved (S.F.) | 313,479       | 505,928<br>(34% of existing) | 192,449    |
| Open Space Required          | 373,507       | 373,507                      | 0          |
| Open Space Provided          | 687,048       | 785,659<br>(26%)             | 98,611     |



# Proposed subdivision plan





# final report

May 9, 2022

## Traffic Impact Study

Oak Grove Subdivision  
10212 Oak Grove Road  
Louisville, KY

Prepared for

Louisville Metro Planning Commission



DIANE B. ZIMMERMAN  
Traffic Engineering, LLC

12803 High Meadows Place  
Parsippany, NJ 07054  
908.666.1800  
diane@dbzllc.com





Table 2. Peak Hour Level of Service

|                                                | A.M.              |                   |                   | P.M.              |                   |                   |
|------------------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Approach                                       | 2021 Existing     | 2027 No Build     | 2027 Build        | 2021 Existing     | 2027 No Build     | 2027 Build        |
| <b>Cedar Creek Road at Independence School</b> |                   |                   |                   |                   |                   |                   |
| Independence School Road Eastbound             | A<br>8.8          | A<br>8.9          | A<br>8.9          | A<br>9.1          | A<br>9.2          | A<br>9.2          |
| Independence School Road Westbound             | B<br>10.1         | B<br>10.4         | B<br>10.7         | B<br>10.9         | B<br>11.3         | B<br>11.7         |
| Cedar Creek Road Northbound                    | A<br>7.3          | A<br>7.3          | A<br>7.3          | A<br>7.3          | A<br>7.3          | A<br>7.3          |
| Cedar Creek Road Southbound                    | A<br>7.7          | A<br>7.7          | A<br>7.6          | A<br>7.9          | A<br>8.0          | A<br>8.1          |
| <b>Oak Grove Road at Thixton Lane</b>          |                   |                   |                   |                   |                   |                   |
| Thixton Lane Westbound                         | A<br>9.5          | A<br>9.6          | B<br>10.5         | B<br>10.0         | B<br>10.2         | B<br>11.9         |
| Oak Grove Road Southbound                      | A<br>8.1          | A<br>8.2          | A<br>8.4          | A<br>7.8          | A<br>7.8          | A<br>7.8          |
| <b>Oak Grove Road at Entrance</b>              |                   |                   |                   |                   |                   |                   |
| Oak Grove Road Westbound                       |                   |                   | A<br>8.8          |                   |                   | A<br>9.3          |
| Oak Grove Road Southbound                      |                   |                   | A<br>7.4          |                   |                   | A<br>7.4          |
| <b>Thixton Lane at Pebble Trace</b>            |                   |                   |                   |                   |                   |                   |
| Thixton Lane Eastbound                         | A<br>7.4          | A<br>7.5          | A<br>7.5          | A<br>7.6          | A<br>7.7          | A<br>7.8          |
| Pebble Trace Southbound                        | A<br>9.7          | A<br>9.8          | B<br>10.4         | B<br>10.4         | B<br>10.6         | B<br>11.5         |
| <b>Bardstown Road at Thixton Lane</b>          | <b>B<br/>14.9</b> | <b>B<br/>16.0</b> | <b>B<br/>14.9</b> | <b>C<br/>29.3</b> | <b>C<br/>32.4</b> | <b>D<br/>42.7</b> |
| Thixton Lane Eastbound                         | D<br>43.3         | D<br>44.4         | E<br>68.4         | E<br>64.8         | E<br>69.1         | E<br>67.3         |
| Bardstown Road Northbound                      | B<br>12.3         | B<br>13.4         | A<br>9.9          | B<br>13.7         | B<br>16.2         | B<br>19.9         |
| Bardstown Road Southbound                      | B<br>15.4         | B<br>16.3         | B<br>13.0         | C<br>32.6         | D<br>35.4         | D<br>51.3         |

Key: Level of Service, Delay in seconds per vehicle



|                                       | A.M.                    |                         |                         | P.M.                    |                         |                         |
|---------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Approach                              | 2021<br>Existing        | 2027<br>No Build        | 2027<br>Build           | 2021<br>Existing        | 2027<br>No Build        | 2027<br>Build           |
| <b>Bardstown Road at Thixton Lane</b> | <b>B</b><br><b>14.9</b> | <b>B</b><br><b>16.0</b> | <b>B</b><br><b>14.9</b> | <b>C</b><br><b>29.3</b> | <b>C</b><br><b>32.4</b> | <b>D</b><br><b>42.7</b> |
| Thixton Lane Eastbound                | D<br>43.3               | D<br>44.4               | E<br>68.4               | E<br>64.8               | E<br>69.1               | E<br>67.3               |
| Bardstown Road Northbound             | B<br>12.3               | B<br>13.4               | A<br>9.9                | B<br>13.7               | B<br>16.2               | B<br>19.9               |
| Bardstown Road Southbound             | B<br>15.4               | B<br>16.3               | B<br>13.0               | C<br>32.6               | D<br>35.4               | D<br>51.3               |

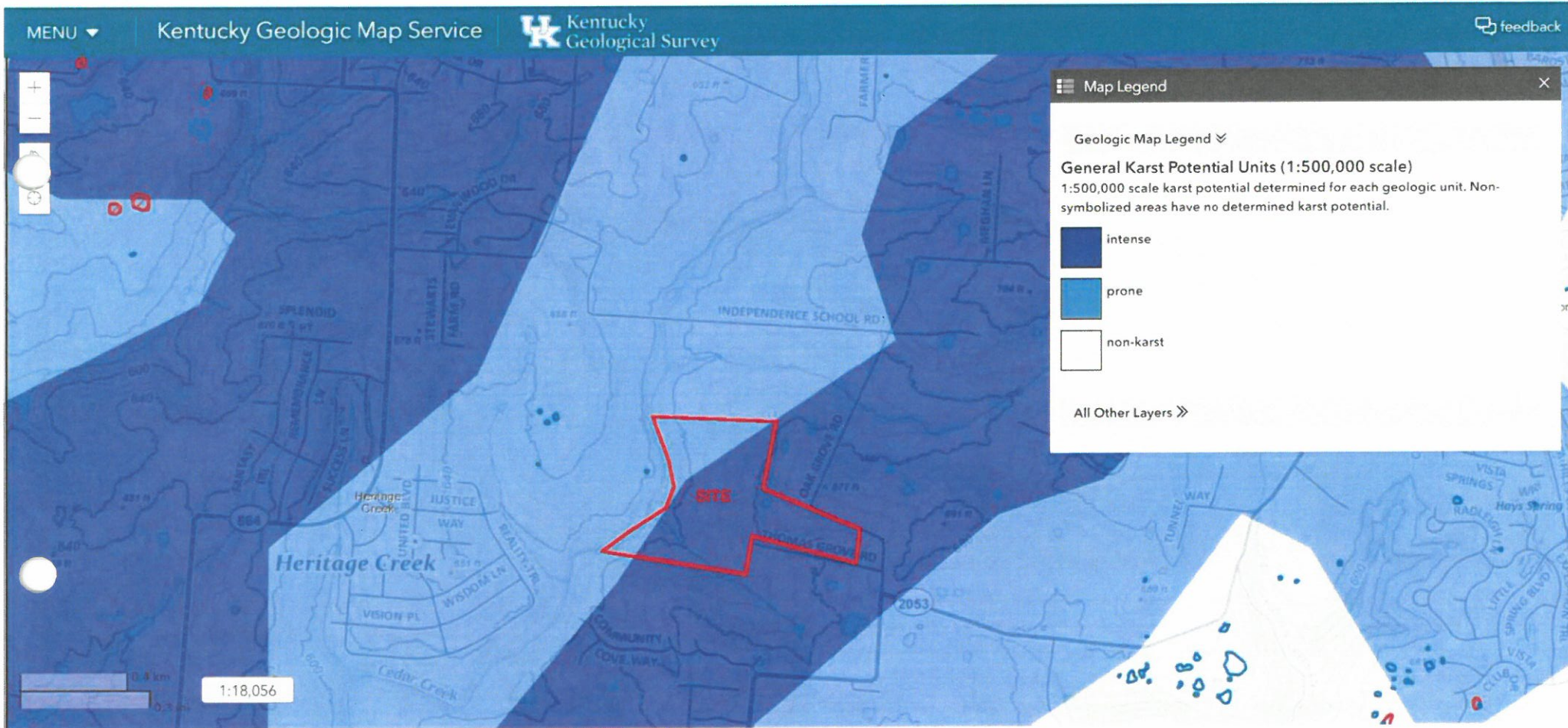
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|---------------------------------------|-------------------------|-----------------------------------|-------------------------|-----------------------------------|
| Approach                              | 2027<br>Build           | 2027<br>Build<br>Thixton Ln Right | 2027<br>Build           | 2027<br>Build<br>Thixton Ln Right |
| <b>Bardstown Road at Thixton Lane</b> | <b>B</b><br><b>14.9</b> | <b>B</b><br><b>10.7</b>           | <b>D</b><br><b>42.7</b> | <b>C</b><br><b>23.5</b>           |
| Thixton Lane Eastbound                | E<br>68.4               | D<br>52.0                         | E<br>67.3               | E<br>64.7                         |
| Bardstown Road Northbound             | A<br>9.9                | A<br>6.7                          | B<br>19.9               | B<br>11.9                         |
| Bardstown Road Southbound             | B<br>13.0               | A<br>9.4                          | D<br>51.3               | C<br>22.6                         |



# Karst Potential Map

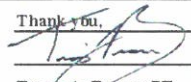




# Karst Survey – Sinkhole location map

 = SINKHOLE



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                        |                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------------------------------------------------------------------------------------------------------------|
| 4-FOR APPROPRIATE ACTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 10-REJECTED            | 14-_____                                                                                                            |
| 5-FOR SIGNATURE & RETURN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 11-NO EXCEPTIONS TAKEN | 15-_____                                                                                                            |
| 6-AS REQUESTED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 12-NOTE MARKINGS       | 16-_____                                                                                                            |
| REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                        | 17-_____                                                                                                            |
| Mindel Scott professional engineer, Travis Brown, conducted online research to assess karst potential at the project site. The Kentucky Geologic Map service online characterizes the site as being karst prone to intense karst potential, with no mapped sinkholes on the site but many in the project vicinity. The engineer visited the site on September 1, 2021 to perform a visual inspection and site walk. Upon walking the site the engineer encountered numerous sinkholes and other potentially karstic features on the site. Their approximate locations are noted on the attached location map. It should be noted that much of the ground was invisible or inaccessible at the time of inspection due to dense vegetation. It is likely to encounter these sinkholes other features during earthwork for the proposed construction. It is recommended to retain geotechnical services during construction to call if sinkholes are encountered. Care should be taken during earthwork to investigate and properly remediate potential sinkholes, per the geotechnical engineer's recommendations. It will be important to proofroll thoroughly before placing fill and after cutting. |                        | 18-_____                                                                                                            |
| COPIES TO: _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                        | SENT BY: <br>Travis A. Brown, PE |







QUESTIONS?





# Traffic Counts



www.marrtraffic.com

## Classified Turn Movement Count || All vehicles

Jefferson County, KY

Site 4 of 4

Cedar Creek Rd (South)  
Cedar Creek Rd (North)  
Independence School Rd (West)  
Independence School Rd (East)

Date

Tuesday, August 24, 2021

Weather

Fair  
87°F

Lat/Long

38.104664°, -85.607391°

0700 - 0900 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound             |             |              |               |              | Southbound             |             |              |               |              | Eastbound                     |              |               |                |              | Westbound                     |              |               |                |              | Int<br>Total |
|----------------|------------------------|-------------|--------------|---------------|--------------|------------------------|-------------|--------------|---------------|--------------|-------------------------------|--------------|---------------|----------------|--------------|-------------------------------|--------------|---------------|----------------|--------------|--------------|
|                | Cedar Creek Rd (South) |             |              |               |              | Cedar Creek Rd (North) |             |              |               |              | Independence School Rd (West) |              |               |                |              | Independence School Rd (East) |              |               |                |              |              |
|                | Left<br>4.1            | Thru<br>4.2 | Right<br>4.3 | U-Turn<br>4.4 | App<br>Total | Left<br>4.5            | Thru<br>4.6 | Right<br>4.7 | U-Turn<br>4.8 | App<br>Total | Left<br>4.9                   | Thru<br>4.10 | Right<br>4.11 | U-Turn<br>4.12 | App<br>Total | Left<br>4.13                  | Thru<br>4.14 | Right<br>4.15 | U-Turn<br>4.16 | App<br>Total |              |
| 0700 - 0715    | 0                      | 5           | 3            | 0             | 8            | 1                      | 6           | 0            | 0             | 7            | 0                             | 1            | 3             | 0              | 4            | 21                            | 0            | 2             | 0              | 23           | 42           |
| 0715 - 0730    | 1                      | 2           | 3            | 0             | 6            | 1                      | 5           | 0            | 0             | 6            | 0                             | 0            | 1             | 0              | 1            | 22                            | 0            | 2             | 0              | 24           | 37           |
| 0730 - 0745    | 2                      | 7           | 3            | 0             | 12           | 0                      | 11          | 0            | 0             | 11           | 0                             | 0            | 3             | 0              | 3            | 46                            | 0            | 2             | 0              | 48           | 74           |
| 0745 - 0800    | 0                      | 3           | 7            | 0             | 10           | 0                      | 1           | 0            | 0             | 1            | 0                             | 0            | 0             | 0              | 0            | 16                            | 1            | 3             | 0              | 20           | 31           |
| Hourly Total   | 3                      | 17          | 16           | 0             | 36           | 2                      | 23          | 0            | 0             | 25           | 0                             | 1            | 7             | 0              | 8            | 105                           | 1            | 9             | 0              | 115          | 184          |
| 0800 - 0815    | 0                      | 5           | 6            | 0             | 11           | 3                      | 6           | 1            | 0             | 10           | 2                             | 0            | 2             | 0              | 4            | 19                            | 0            | 2             | 0              | 21           | 46           |
| 0815 - 0830    | 0                      | 6           | 8            | 0             | 14           | 0                      | 12          | 0            | 0             | 12           | 1                             | 0            | 1             | 0              | 2            | 12                            | 0            | 2             | 0              | 14           | 42           |
| 0830 - 0845    | 0                      | 7           | 5            | 0             | 12           | 0                      | 7           | 0            | 0             | 7            | 0                             | 0            | 0             | 0              | 0            | 7                             | 0            | 3             | 0              | 10           | 29           |
| 0845 - 0900    | 0                      | 2           | 9            | 0             | 11           | 1                      | 13          | 0            | 0             | 14           | 0                             | 0            | 2             | 0              | 2            | 9                             | 0            | 3             | 0              | 12           | 39           |
| Hourly Total   | 0                      | 20          | 28           | 0             | 48           | 4                      | 38          | 1            | 0             | 43           | 3                             | 0            | 5             | 0              | 8            | 47                            | 0            | 10            | 0              | 57           | 156          |
| Grand Total    | 3                      | 37          | 44           | 0             | 84           | 6                      | 61          | 1            | 0             | 68           | 3                             | 1            | 12            | 0              | 16           | 152                           | 1            | 19            | 0              | 172          | 340          |
| Approach %     | 3.57                   | 44.05       | 52.38        | 0.00          | -            | 8.82                   | 89.71       | 1.47         | 0.00          | -            | 18.75                         | 6.25         | 75.00         | 0.00           | -            | 88.37                         | 0.58         | 11.05         | 0.00           | -            | -            |
| Intersection % | 0.88                   | 10.88       | 12.94        | 0.00          | 24.71        | 1.76                   | 17.94       | 0.29         | 0.00          | 20.00        | 0.88                          | 0.29         | 3.53          | 0.00           | 4.71         | 44.71                         | 0.29         | 5.59          | 0.00           | 50.59        | -            |
| PHF            | 0.25                   | 0.75        | 0.75         | 0.00          | 0.84         | 0.25                   | 0.63        | 0.25         | 0.00          | 0.71         | 0.38                          | 0.00         | 0.50          | 0.00           | 0.56         | 0.51                          | 0.25         | 0.75          | 0.00           | 0.54         | 0.65         |

1600 - 1800 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound             |          |           |            |           | Southbound             |          |           |            |           | Eastbound                     |           |            |             |           | Westbound                     |           |            |             |           | Int Total |
|----------------|------------------------|----------|-----------|------------|-----------|------------------------|----------|-----------|------------|-----------|-------------------------------|-----------|------------|-------------|-----------|-------------------------------|-----------|------------|-------------|-----------|-----------|
|                | Cedar Creek Rd (South) |          |           |            |           | Cedar Creek Rd (North) |          |           |            |           | Independence School Rd (West) |           |            |             |           | Independence School Rd (East) |           |            |             |           |           |
|                | Left 4.1               | Thru 4.2 | Right 4.3 | U-Turn 4.4 | App Total | Left 4.5               | Thru 4.6 | Right 4.7 | U-Turn 4.8 | App Total | Left 4.9                      | Thru 4.10 | Right 4.11 | U-Turn 4.12 | App Total | Left 4.13                     | Thru 4.14 | Right 4.15 | U-Turn 4.16 | App Total |           |
| 1600 - 1615    | 3                      | 6        | 26        | 0          | 35        | 3                      | 10       | 2         | 0          | 15        | 0                             | 0         | 1          | 0           | 1         | 15                            | 0         | 2          | 0           | 17        | 68        |
| 1615 - 1630    | 3                      | 11       | 25        | 0          | 39        | 3                      | 7        | 0         | 0          | 10        | 0                             | 0         | 0          | 0           | 0         | 6                             | 1         | 3          | 0           | 10        | 59        |
| 1630 - 1645    | 1                      | 17       | 50        | 0          | 68        | 3                      | 19       | 2         | 0          | 24        | 1                             | 0         | 1          | 0           | 2         | 12                            | 0         | 4          | 0           | 16        | 110       |
| 1645 - 1700    | 1                      | 6        | 35        | 0          | 42        | 2                      | 6        | 0         | 0          | 8         | 1                             | 0         | 1          | 0           | 2         | 10                            | 1         | 4          | 0           | 15        | 67        |
| Hourly Total   | 8                      | 40       | 136       | 0          | 184       | 11                     | 42       | 4         | 0          | 57        | 2                             | 0         | 3          | 0           | 5         | 43                            | 2         | 13         | 0           | 58        | 304       |
| 1700 - 1715    | 5                      | 20       | 37        | 0          | 62        | 4                      | 8        | 0         | 0          | 12        | 0                             | 0         | 5          | 0           | 5         | 6                             | 1         | 1          | 0           | 8         | 87        |
| 1715 - 1730    | 3                      | 14       | 30        | 0          | 47        | 4                      | 6        | 0         | 0          | 10        | 0                             | 0         | 0          | 0           | 0         | 3                             | 0         | 0          | 0           | 3         | 60        |
| 1730 - 1745    | 2                      | 8        | 22        | 0          | 32        | 2                      | 7        | 2         | 0          | 11        | 1                             | 0         | 4          | 0           | 5         | 7                             | 0         | 4          | 0           | 11        | 59        |
| 1745 - 1800    | 4                      | 4        | 17        | 0          | 25        | 1                      | 7        | 1         | 0          | 9         | 3                             | 0         | 2          | 0           | 5         | 5                             | 0         | 2          | 0           | 7         | 46        |
| Hourly Total   | 14                     | 46       | 106       | 0          | 166       | 11                     | 28       | 3         | 0          | 42        | 4                             | 0         | 11         | 0           | 15        | 21                            | 1         | 7          | 0           | 29        | 252       |
| Grand Total    | 22                     | 86       | 242       | 0          | 350       | 22                     | 70       | 7         | 0          | 99        | 6                             | 0         | 14         | 0           | 20        | 64                            | 3         | 20         | 0           | 87        | 556       |
| Approach %     | 6.29                   | 24.57    | 69.14     | 0.00       | -         | 22.22                  | 70.71    | 7.07      | 0.00       | -         | 30.00                         | 0.00      | 70.00      | 0.00        | -         | 73.56                         | 3.45      | 22.99      | 0.00        | -         | -         |
| Intersection % | 3.96                   | 15.47    | 43.53     | 0.00       | 62.95     | 3.96                   | 12.59    | 1.26      | 0.00       | 17.81     | 1.08                          | 0.00      | 2.52       | 0.00        | 3.60      | 11.51                         | 0.54      | 3.60       | 0.00        | 15.65     | -         |
| PHF            | 0.50                   | 0.71     | 0.76      | 0.00       | 0.81      | 0.81                   | 0.51     | 0.25      | 0.00       | 0.56      | 0.50                          | 0.00      | 0.35       | 0.00        | 0.45      | 0.65                          | 0.50      | 0.56       | 0.00        | 0.66      | 0.74      |



# Classified Turn Movement Count || All vehicles

Jefferson County, KY

## Site 2 of 4

KY-2053 Thixton Ln (South)  
Oak Grove Rd

KY-2053 Thixton Ln (East)

## Date

Tuesday, August 24, 2021

## Lat/Long

38.09235°, -85.593529°

## Weather

Fair  
87°F

## 0700 - 0900 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound<br>KY-2053 Thixton Ln (South) |       |        |       |       | Southbound<br>Oak Grove Rd |      |        |      |       | Westbound<br>KY-2053 Thixton Ln (East) |       |        |       |       |
|----------------|------------------------------------------|-------|--------|-------|-------|----------------------------|------|--------|------|-------|----------------------------------------|-------|--------|-------|-------|
|                | Thru                                     | Right | U-Turn | App   | Total | Left                       | Thru | U-Turn | App  | Total | Left                                   | Right | U-Turn | App   | Int   |
|                | 2.1                                      | 2.2   | 2.3    |       |       | 2.4                        | 2.5  |        |      |       | 2.7                                    | 2.8   | 2.9    | Total | Total |
| 0700 - 0715    | 4                                        | 26    | 0      | 30    | 0     | 3                          |      | 0      | 3    |       | 13                                     | 2     | 0      | 15    | 48    |
| 0715 - 0730    | 6                                        | 29    | 0      | 35    | 0     | 5                          |      | 0      | 5    |       | 14                                     | 1     | 0      | 15    | 55    |
| 0730 - 0745    | 6                                        | 18    | 0      | 24    | 1     | 1                          |      | 0      | 2    |       | 30                                     | 2     | 0      | 32    | 58    |
| 0745 - 0800    | 6                                        | 18    | 0      | 24    | 1     | 4                          |      | 0      | 5    |       | 20                                     | 2     | 0      | 22    | 51    |
| Hourly Total   | 22                                       | 91    | 0      | 113   | 2     | 13                         |      | 0      | 15   |       | 77                                     | 7     | 0      | 84    | 212   |
| 0800 - 0815    | 6                                        | 24    | 0      | 30    | 1     | 2                          |      | 0      | 3    |       | 26                                     | 0     | 0      | 26    | 59    |
| 0815 - 0830    | 2                                        | 18    | 0      | 20    | 1     | 3                          |      | 0      | 4    |       | 16                                     | 2     | 0      | 18    | 42    |
| 0830 - 0845    | 3                                        | 22    | 0      | 25    | 0     | 2                          |      | 0      | 2    |       | 8                                      | 0     | 0      | 8     | 35    |
| 0845 - 0900    | 1                                        | 20    | 0      | 21    | 1     | 3                          |      | 0      | 4    |       | 12                                     | 1     | 0      | 13    | 38    |
| Hourly Total   | 12                                       | 84    | 0      | 96    | 3     | 10                         |      | 0      | 13   |       | 62                                     | 3     | 0      | 65    | 174   |
| Grand Total    | 34                                       | 175   | 0      | 209   | 5     | 23                         |      | 0      | 28   |       | 139                                    | 10    | 0      | 149   | 386   |
| Approach %     | 16.27                                    | 83.73 | 0.00   | -     | 17.86 | 82.14                      |      | 0.00   | -    |       | 93.29                                  | 6.71  | 0.00   | -     |       |
| Intersection % | 8.81                                     | 45.34 | 0.00   | 54.15 | 1.30  | 5.96                       |      | 0.00   | 7.25 |       | 36.01                                  | 2.59  | 0.00   | 38.60 |       |
| PHF            | 1.00                                     | 0.77  | 0.00   | 0.81  | 0.75  | 0.60                       |      | 0.00   | 0.75 |       | 0.75                                   | 0.63  | 0.00   | 0.74  | 0.94  |

## 1600 - 1800 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound<br>KY-2053 Thixton Ln (South) |       |        |       |       | Southbound<br>Oak Grove Rd |      |        |       |       | Westbound<br>KY-2053 Thixton Ln (East) |       |        |       |       |
|----------------|------------------------------------------|-------|--------|-------|-------|----------------------------|------|--------|-------|-------|----------------------------------------|-------|--------|-------|-------|
|                | Thru                                     | Right | U-Turn | App   | Total | Left                       | Thru | U-Turn | App   | Total | Left                                   | Right | U-Turn | App   | Int   |
|                | 2.1                                      | 2.2   | 2.3    |       |       | 2.4                        | 2.5  |        |       |       | 2.7                                    | 2.8   | 2.9    | Total | Total |
| 1600 - 1615    | 3                                        | 29    | 0      | 32    | 3     | 6                          |      | 0      | 9     |       | 22                                     | 1     | 0      | 23    | 64    |
| 1615 - 1630    | 1                                        | 24    | 0      | 25    | 2     | 8                          |      | 0      | 10    |       | 18                                     | 0     | 0      | 18    | 53    |
| 1630 - 1645    | 6                                        | 43    | 0      | 49    | 3     | 5                          |      | 0      | 8     |       | 30                                     | 2     | 0      | 32    | 89    |
| 1645 - 1700    | 1                                        | 45    | 0      | 46    | 1     | 1                          |      | 0      | 2     |       | 38                                     | 2     | 0      | 40    | 88    |
| Hourly Total   | 11                                       | 141   | 0      | 152   | 9     | 20                         |      | 0      | 29    |       | 108                                    | 5     | 0      | 113   | 294   |
| 1700 - 1715    | 1                                        | 37    | 0      | 38    | 2     | 7                          |      | 0      | 9     |       | 32                                     | 3     | 0      | 35    | 82    |
| 1715 - 1730    | 1                                        | 32    | 0      | 33    | 0     | 6                          |      | 0      | 6     |       | 29                                     | 0     | 0      | 29    | 68    |
| 1730 - 1745    | 3                                        | 29    | 0      | 32    | 3     | 6                          |      | 0      | 9     |       | 32                                     | 0     | 0      | 32    | 73    |
| 1745 - 1800    | 4                                        | 23    | 0      | 27    | 2     | 5                          |      | 0      | 7     |       | 30                                     | 0     | 0      | 30    | 64    |
| Hourly Total   | 9                                        | 121   | 0      | 130   | 7     | 24                         |      | 0      | 31    |       | 123                                    | 3     | 0      | 126   | 287   |
| Grand Total    | 20                                       | 262   | 0      | 282   | 16    | 44                         |      | 0      | 60    |       | 231                                    | 8     | 0      | 239   | 581   |
| Approach %     | 7.09                                     | 92.91 | 0.00   | -     | 26.67 | 73.33                      |      | 0.00   | -     |       | 96.65                                  | 3.35  | 0.00   | -     |       |
| Intersection % | 3.44                                     | 45.09 | 0.00   | 48.54 | 2.75  | 7.57                       |      | 0.00   | 10.33 |       | 39.76                                  | 1.38  | 0.00   | 41.14 |       |
| PHF            | 0.38                                     | 0.87  | 0.00   | 0.85  | 0.50  | 0.68                       |      | 0.00   | 0.69  |       | 0.85                                   | 0.58  | 0.00   | 0.85  | 0.92  |



# Classified Turn Movement Count || All vehicles

Jefferson County, KY

## Site 3 of 4

KY-2053 Thixton Ln (South)  
Pebble Trace

KY-2053 Thixton Ln (East)

## Date

Tuesday, August 24, 2021

## Weather

Fair  
87°F

## Lat/Long

38.089712°, -85.598788°

## 0700 - 0900 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound                 |       |        |       |       | Southbound   |      |        |       |       | Westbound                 |       |        |       |       |
|----------------|----------------------------|-------|--------|-------|-------|--------------|------|--------|-------|-------|---------------------------|-------|--------|-------|-------|
|                | KY-2053 Thixton Ln (South) |       |        |       |       | Pebble Trace |      |        |       |       | KY-2053 Thixton Ln (East) |       |        |       |       |
|                | Thru                       | Right | U-Turn | App   | Total | Left         | Thru | U-Turn | App   | Total | Left                      | Right | U-Turn | App   | Int   |
|                | 3.1                        | 3.2   | 3.3    |       |       | 3.4          | 3.5  | 3.6    |       |       | 3.7                       | 3.8   | 3.9    | Total | Total |
| 0700 - 0715    | 0                          | 20    | 0      | 20    | 11    | 5            |      | 0      | 16    |       | 12                        | 2     | 0      | 14    | 50    |
| 0715 - 0730    | 1                          | 18    | 0      | 19    | 11    | 6            |      | 0      | 17    |       | 12                        | 5     | 0      | 17    | 53    |
| 0730 - 0745    | 4                          | 17    | 0      | 21    | 8     | 6            |      | 0      | 14    |       | 32                        | 2     | 0      | 34    | 69    |
| 0745 - 0800    | 2                          | 19    | 0      | 21    | 6     | 6            |      | 0      | 12    |       | 20                        | 4     | 0      | 24    | 57    |
| Hourly Total   | 7                          | 74    | 0      | 81    | 36    | 23           |      | 0      | 59    |       | 76                        | 13    | 0      | 89    | 229   |
| 0800 - 0815    | 3                          | 20    | 0      | 23    | 10    | 8            |      | 0      | 18    |       | 24                        | 4     | 0      | 28    | 69    |
| 0815 - 0830    | 1                          | 14    | 0      | 15    | 8     | 10           |      | 0      | 18    |       | 17                        | 3     | 0      | 20    | 53    |
| 0830 - 0845    | 0                          | 17    | 0      | 17    | 6     | 2            |      | 0      | 8     |       | 6                         | 3     | 0      | 9     | 34    |
| 0845 - 0900    | 0                          | 15    | 0      | 15    | 4     | 2            |      | 0      | 6     |       | 14                        | 2     | 0      | 16    | 37    |
| Hourly Total   | 4                          | 66    | 0      | 70    | 28    | 22           |      | 0      | 50    |       | 61                        | 12    | 0      | 73    | 193   |
| Grand Total    | 11                         | 140   | 0      | 151   | 64    | 45           |      | 0      | 109   |       | 137                       | 25    | 0      | 162   | 422   |
| Approach %     | 7.28                       | 92.72 | 0.00   | -     | 58.72 | 41.28        |      | 0.00   | -     |       | 84.57                     | 15.43 | 0.00   | -     | -     |
| Intersection % | 2.61                       | 33.18 | 0.00   | 35.78 | 15.17 | 10.66        |      | 0.00   | 25.83 |       | 32.46                     | 5.92  | 0.00   | 38.39 | -     |
| PHF            | 0.63                       | 0.93  | 0.00   | 0.91  | 0.80  | 0.81         |      | 0.00   | 0.85  |       | 0.69                      | 0.75  | 0.00   | 0.76  | 0.90  |

## 1600 - 1800 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound                 |       |        |       |       | Southbound   |      |        |      |       | Westbound                 |       |        |       |       |
|----------------|----------------------------|-------|--------|-------|-------|--------------|------|--------|------|-------|---------------------------|-------|--------|-------|-------|
|                | KY-2053 Thixton Ln (South) |       |        |       |       | Pebble Trace |      |        |      |       | KY-2053 Thixton Ln (East) |       |        |       |       |
|                | Thru                       | Right | U-Turn | App   | Total | Left         | Thru | U-Turn | App  | Total | Left                      | Right | U-Turn | App   | Int   |
|                | 3.1                        | 3.2   | 3.3    |       |       | 3.4          | 3.5  | 3.6    |      |       | 3.7                       | 3.8   | 3.9    | Total | Total |
| 1600 - 1615    | 1                          | 25    | 0      | 26    | 6     | 1            |      | 0      | 7    |       | 20                        | 9     | 0      | 29    | 62    |
| 1615 - 1630    | 3                          | 23    | 0      | 26    | 4     | 4            |      | 0      | 8    |       | 18                        | 7     | 0      | 25    | 59    |
| 1630 - 1645    | 7                          | 44    | 0      | 51    | 5     | 2            |      | 0      | 7    |       | 30                        | 5     | 0      | 35    | 93    |
| 1645 - 1700    | 4                          | 38    | 0      | 42    | 5     | 2            |      | 0      | 7    |       | 24                        | 9     | 0      | 33    | 82    |
| Hourly Total   | 15                         | 130   | 0      | 145   | 20    | 9            |      | 0      | 29   |       | 92                        | 30    | 0      | 122   | 296   |
| 1700 - 1715    | 4                          | 33    | 0      | 37    | 4     | 2            |      | 0      | 6    |       | 29                        | 15    | 0      | 44    | 87    |
| 1715 - 1730    | 7                          | 29    | 0      | 36    | 5     | 3            |      | 0      | 8    |       | 31                        | 5     | 0      | 36    | 80    |
| 1730 - 1745    | 8                          | 29    | 0      | 37    | 4     | 2            |      | 0      | 6    |       | 21                        | 17    | 0      | 38    | 81    |
| 1745 - 1800    | 9                          | 22    | 0      | 31    | 5     | 2            |      | 0      | 7    |       | 26                        | 9     | 0      | 35    | 73    |
| Hourly Total   | 28                         | 113   | 0      | 141   | 18    | 9            |      | 0      | 27   |       | 107                       | 46    | 0      | 153   | 321   |
| Grand Total    | 43                         | 243   | 0      | 286   | 38    | 18           |      | 0      | 56   |       | 199                       | 76    | 0      | 275   | 617   |
| Approach %     | 15.03                      | 84.97 | 0.00   | -     | 67.86 | 32.14        |      | 0.00   | -    |       | 72.36                     | 27.64 | 0.00   | -     | -     |
| Intersection % | 6.97                       | 39.38 | 0.00   | 46.35 | 6.16  | 2.92         |      | 0.00   | 9.08 |       | 32.25                     | 12.32 | 0.00   | 44.57 | -     |
| PHF            | 0.79                       | 0.82  | 0.00   | 0.81  | 0.95  | 0.75         |      | 0.00   | 0.88 |       | 0.92                      | 0.57  | 0.00   | 0.84  | 0.92  |



# Classified Turn Movement Count || All vehicles

Jefferson County, KY



**Marr Traffic**  
DATA COLLECTION

www.marrtraffic.com

## Site 1 of 4

US-150 Bardstown Rd (South)  
US-150 Bardstown Rd (North)  
KY-2053 Thixton Ln

## Date

Tuesday, August 24, 2021

## Weather

Fair  
87°F

## Lat/Long

38.100655°, -85.565656°

## 0700 - 0900 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound                  |             |               |              | Southbound                  |              |               |              | Eastbound          |              |               |              | Int<br>Total |
|----------------|-----------------------------|-------------|---------------|--------------|-----------------------------|--------------|---------------|--------------|--------------------|--------------|---------------|--------------|--------------|
|                | US-150 Bardstown Rd (South) |             |               |              | US-150 Bardstown Rd (North) |              |               |              | KY-2053 Thixton Ln |              |               |              |              |
|                | Left<br>1.1                 | Thru<br>1.2 | U-Turn<br>1.3 | App<br>Total | Thru<br>1.4                 | Right<br>1.5 | U-Turn<br>1.6 | App<br>Total | Left<br>1.7        | Right<br>1.8 | U-Turn<br>1.9 | App<br>Total |              |
| 0700 - 0715    | 40                          | 455         | 0             | 495          | 178                         | 8            | 0             | 186          | 28                 | 17           | 0             | 45           | 726          |
| 0715 - 0730    | 76                          | 459         | 0             | 535          | 157                         | 9            | 0             | 166          | 30                 | 9            | 0             | 39           | 740          |
| 0730 - 0745    | 75                          | 335         | 0             | 410          | 196                         | 26           | 0             | 222          | 25                 | 14           | 0             | 39           | 671          |
| 0745 - 0800    | 40                          | 338         | 0             | 378          | 227                         | 13           | 1             | 241          | 14                 | 13           | 0             | 27           | 646          |
| Hourly Total   | 231                         | 1587        | 0             | 1818         | 758                         | 56           | 1             | 815          | 97                 | 53           | 0             | 150          | 2783         |
| 0800 - 0815    | 20                          | 336         | 0             | 356          | 198                         | 27           | 0             | 225          | 29                 | 10           | 0             | 39           | 620          |
| 0815 - 0830    | 24                          | 351         | 0             | 375          | 194                         | 16           | 0             | 210          | 26                 | 10           | 0             | 36           | 621          |
| 0830 - 0845    | 17                          | 347         | 0             | 364          | 159                         | 8            | 0             | 167          | 34                 | 13           | 0             | 47           | 578          |
| 0845 - 0900    | 20                          | 308         | 0             | 328          | 169                         | 13           | 0             | 182          | 26                 | 13           | 0             | 39           | 549          |
| Hourly Total   | 81                          | 1342        | 0             | 1423         | 720                         | 64           | 0             | 784          | 115                | 46           | 0             | 161          | 2368         |
| Grand Total    | 312                         | 2929        | 0             | 3241         | 1478                        | 120          | 1             | 1599         | 212                | 99           | 0             | 311          | 5151         |
| Approach %     | 9.63                        | 90.37       | 0.00          | -            | 92.43                       | 7.50         | 0.06          | -            | 68.17              | 31.83        | 0.00          | -            |              |
| Intersection % | 6.06                        | 56.86       | 0.00          | 62.92        | 28.69                       | 2.33         | 0.02          | 31.04        | 4.12               | 1.92         | 0.00          | 6.04         |              |
| PHF            | 0.76                        | 0.86        | 0.00          | 0.85         | 0.83                        | 0.54         | 0.25          | 0.85         | 0.81               | 0.78         | 0.00          | 0.83         | 0.94         |

## 1600 - 1800 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound                  |             |               |              | Southbound                  |              |               |              | Eastbound          |              |               |              | Int<br>Total |
|----------------|-----------------------------|-------------|---------------|--------------|-----------------------------|--------------|---------------|--------------|--------------------|--------------|---------------|--------------|--------------|
|                | US-150 Bardstown Rd (South) |             |               |              | US-150 Bardstown Rd (North) |              |               |              | KY-2053 Thixton Ln |              |               |              |              |
|                | Left<br>1.1                 | Thru<br>1.2 | U-Turn<br>1.3 | App<br>Total | Thru<br>1.4                 | Right<br>1.5 | U-Turn<br>1.6 | App<br>Total | Left<br>1.7        | Right<br>1.8 | U-Turn<br>1.9 | App<br>Total |              |
| 1600 - 1615    | 23                          | 274         | 0             | 297          | 375                         | 37           | 0             | 412          | 23                 | 50           | 0             | 73           | 782          |
| 1615 - 1630    | 18                          | 257         | 0             | 275          | 422                         | 44           | 0             | 466          | 18                 | 44           | 0             | 62           | 803          |
| 1630 - 1645    | 23                          | 258         | 0             | 281          | 426                         | 37           | 0             | 463          | 27                 | 58           | 0             | 85           | 829          |
| 1645 - 1700    | 34                          | 294         | 0             | 328          | 414                         | 40           | 0             | 454          | 35                 | 62           | 0             | 97           | 879          |
| Hourly Total   | 98                          | 1083        | 0             | 1181         | 1637                        | 158          | 0             | 1795         | 103                | 214          | 0             | 317          | 3293         |
| 1700 - 1715    | 22                          | 249         | 0             | 271          | 503                         | 32           | 0             | 535          | 22                 | 43           | 0             | 65           | 871          |
| 1715 - 1730    | 23                          | 240         | 0             | 263          | 441                         | 32           | 0             | 473          | 23                 | 58           | 0             | 81           | 817          |
| 1730 - 1745    | 18                          | 252         | 0             | 270          | 483                         | 33           | 0             | 516          | 26                 | 48           | 0             | 74           | 860          |
| 1745 - 1800    | 19                          | 251         | 0             | 270          | 463                         | 40           | 0             | 503          | 28                 | 34           | 0             | 62           | 835          |
| Hourly Total   | 82                          | 992         | 0             | 1074         | 1890                        | 137          | 0             | 2027         | 99                 | 183          | 0             | 282          | 3383         |
| Grand Total    | 180                         | 2075        | 0             | 2255         | 3527                        | 295          | 0             | 3822         | 202                | 397          | 0             | 599          | 6676         |
| Approach %     | 7.98                        | 92.02       | 0.00          | -            | 92.28                       | 7.72         | 0.00          | -            | 33.72              | 66.28        | 0.00          | -            |              |
| Intersection % | 2.70                        | 31.08       | 0.00          | 33.78        | 52.83                       | 4.42         | 0.00          | 57.25        | 3.03               | 5.95         | 0.00          | 8.97         |              |
| PHF            | 0.71                        | 0.88        | 0.00          | 0.86         | 0.92                        | 0.86         | 0.00          | 0.92         | 0.76               | 0.85         | 0.00          | 0.82         | 0.97         |



final report

May 9, 2022

## Traffic Impact Study

Oak Grove Subdivision  
10212 Oak Grove Road  
Louisville, KY

Prepared for

Louisville Metro Planning Commission



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**RECEIVED**

MAY 09 2022

PLANNING & DESIGN  
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21-ZONE-0059



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## INTRODUCTION

The site plan for the proposed Oak Grove subdivision shows 180 single-family lots on Oak Grove Road in Louisville, KY. **Figure 1** displays a map of the site. Access to the site will be from Oak Grove Road. The subdivision also connects to Mossy Creek Way. The purpose of this study is to examine the traffic impacts of the development upon the adjacent highway system. For this study, the impact area was defined to be the intersections of Oak Grove Road with Thixton Lane, Thixton Lane with Pebble Trace and Bardstown Road, and Independence School Road with Cedar Creek Road.

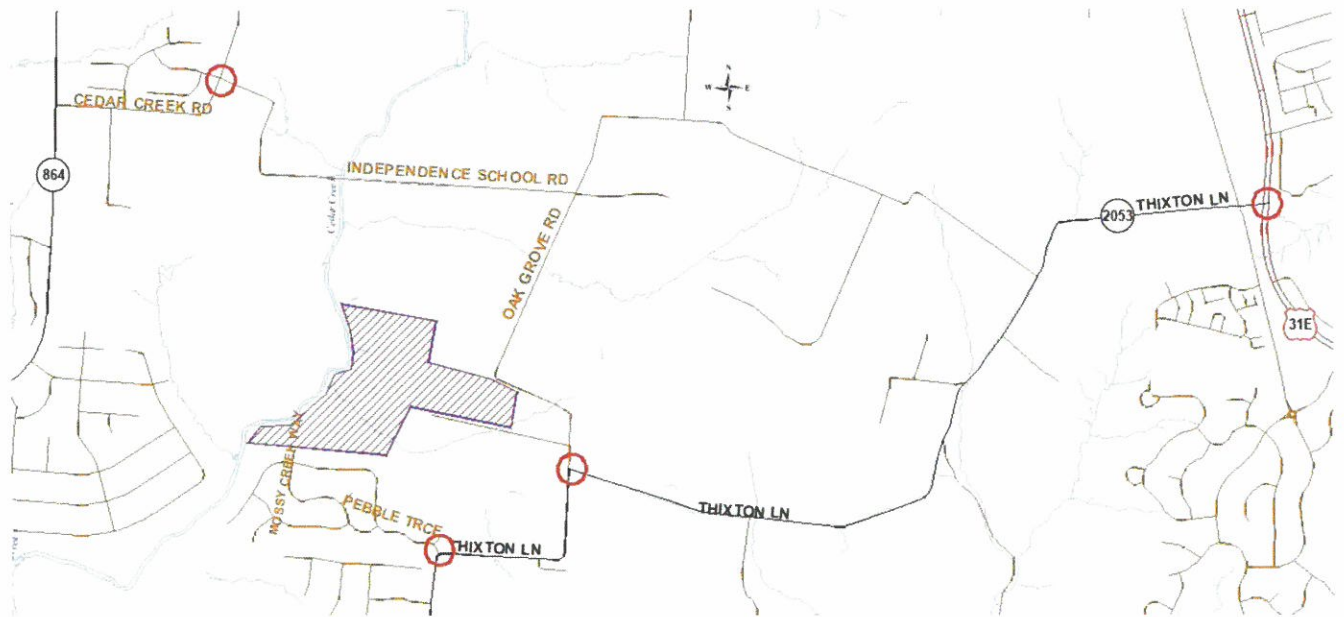


Figure 1. Site Map

## EXISTING CONDITIONS

Oak Grove Road is a Metro-maintained road with an estimated 2021 ADT of 400 vehicles per day north of Thixton Lane, as estimated from the turning movement count. The road is a two-lane highway with nine-foot lanes with one-foot stabilized shoulders. The speed limit is 35 mph. There are no sidewalks. The intersection with Thixton Lane is controlled with a stop sign on the westbound approach of Thixton Lane.

Peak hour traffic counts for the intersections were obtained on Tuesday, August 24, 2021. The a.m. and p.m. peak hour varied between the intersections. **Figure 2** illustrates the existing a.m. and p.m. peak hour traffic volumes. The Appendix contains the full count data.



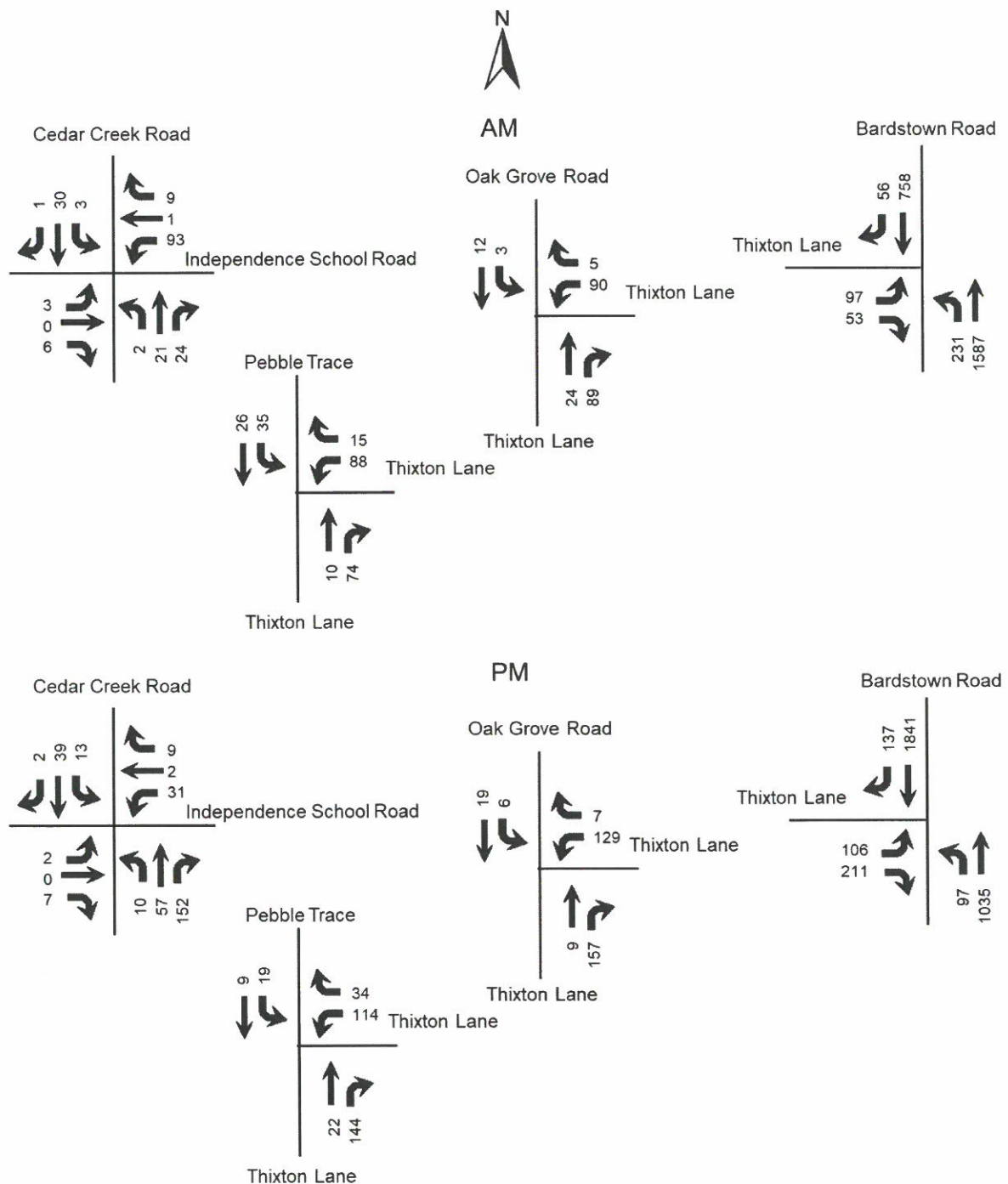


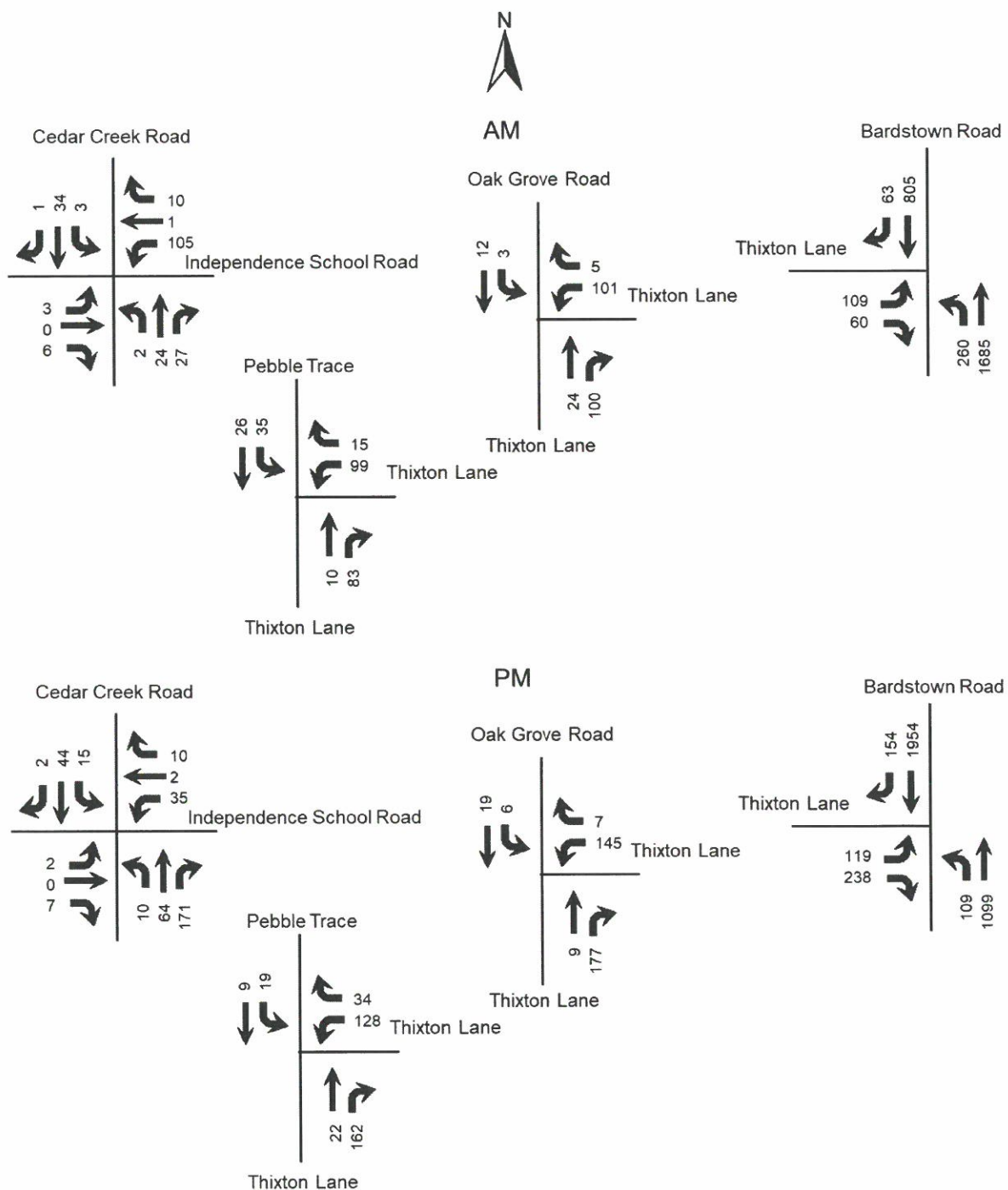
Figure 2. Existing Peak Hour Volumes

## FUTURE CONDITIONS

The project completion date is 2027. An annual growth rate of 2 percent was applied to the 2021 thru volumes on Thixton Lane and Cedar Creek Road. This was determined by the historical growth at KYTC station 274. One percent



annual growth was applied to the thru traffic on Bardstown Road. **Figure 3** displays the 2027 No Build peak hour volumes.



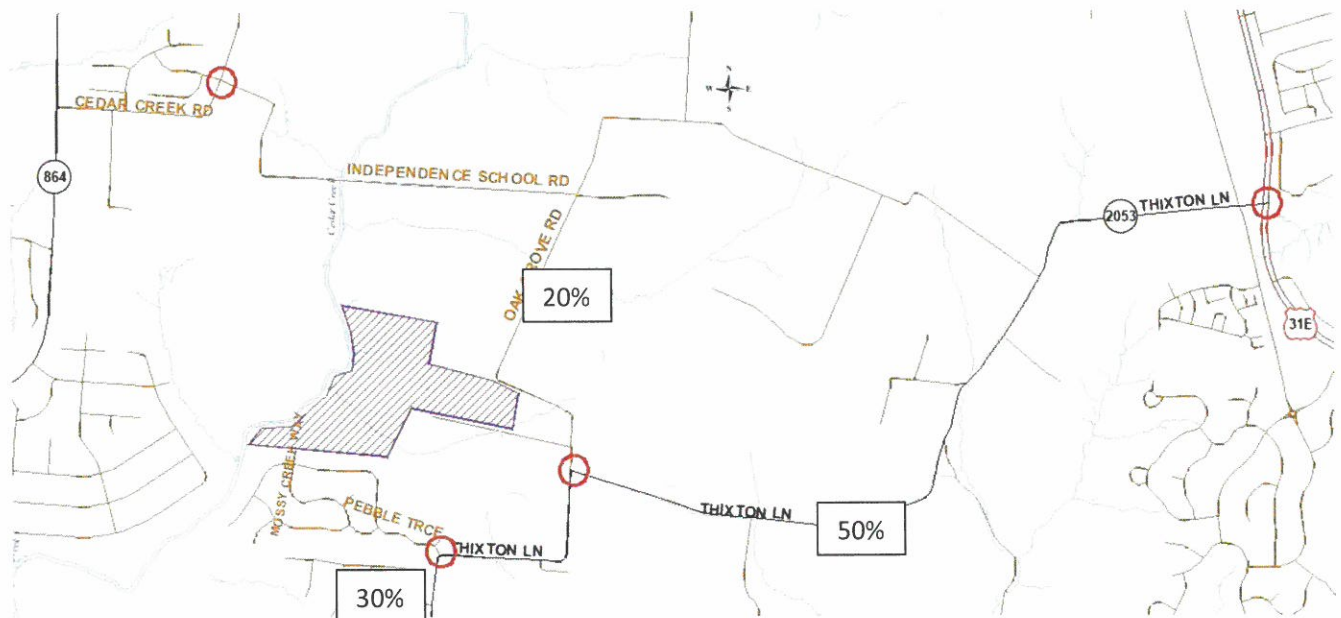


## TRIP GENERATION

The Institute of Transportation Engineers Trip Generation Manual, 11<sup>th</sup> Edition contains trip generation rates for a wide range of developments. The land use of "Single-Family Detached (210)" was reviewed and determined to be the best match. The trip generation results are listed in **Table 1**. The trips were assigned to the highway network with the percentages shown in **Figure 4**. **Figure 5** shows the trips generated by this development and distributed throughout the road network during the peak hours. **Figure 6** displays the individual turning movements for the peak hours when the development is completed. The entrance is shown in the diagram with a north/south orientation for simplicity on the figures. At the entrance Oak Grove Road is the southbound approach and the westbound approach and the entrance is the northbound approach.

**Table 1. Peak Hour Trips Generated by Site**

| Land Use                  | A.M. Peak Hour |    |     | P.M. Peak Hour |     |     |
|---------------------------|----------------|----|-----|----------------|-----|-----|
|                           | Trips          | In | Out | Trips          | In  | Out |
| Single-Family (180 units) | 127            | 33 | 94  | 173            | 109 | 64  |



**Figure 4. Trip Distribution Percentages**



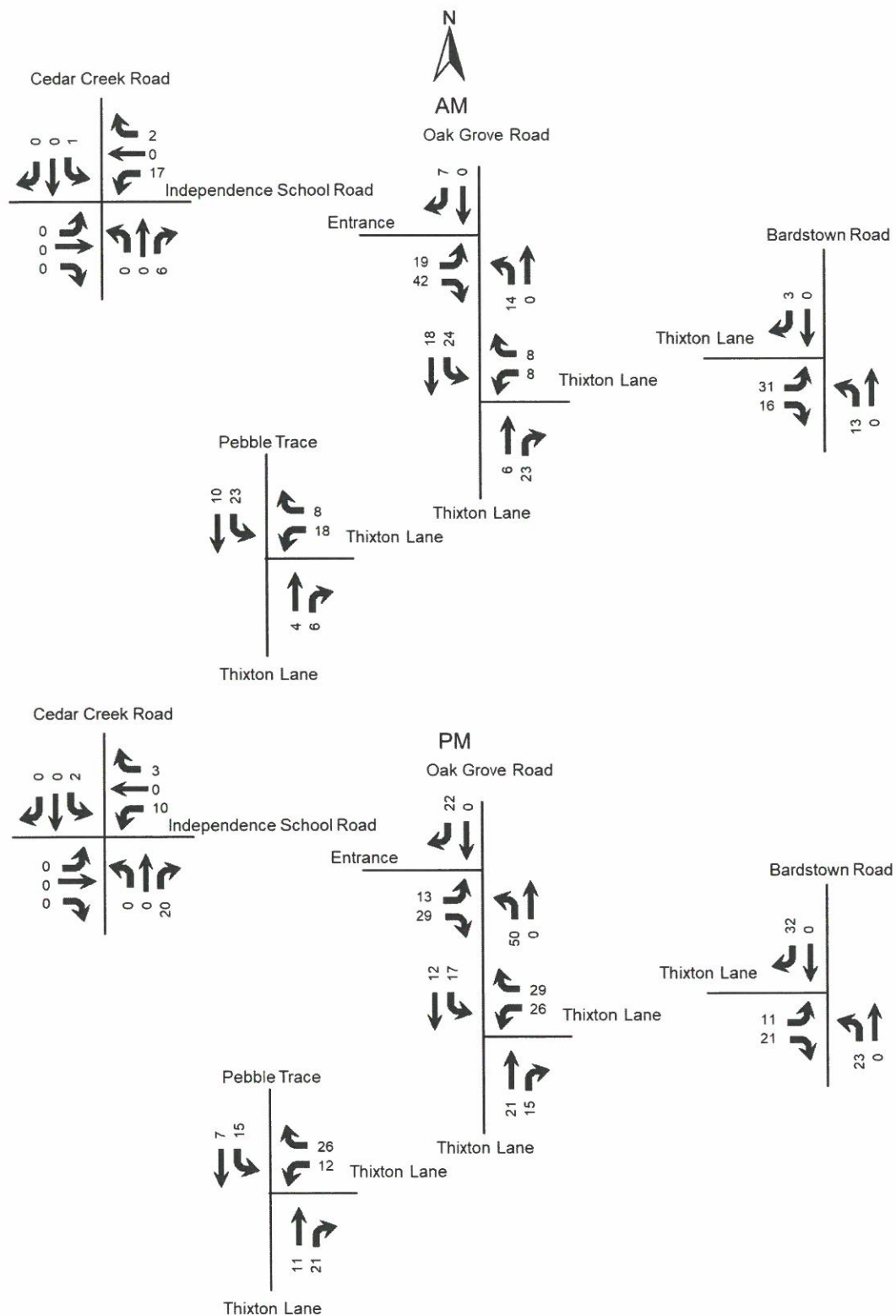


Figure 5. Peak Hour Trips Generated by Site



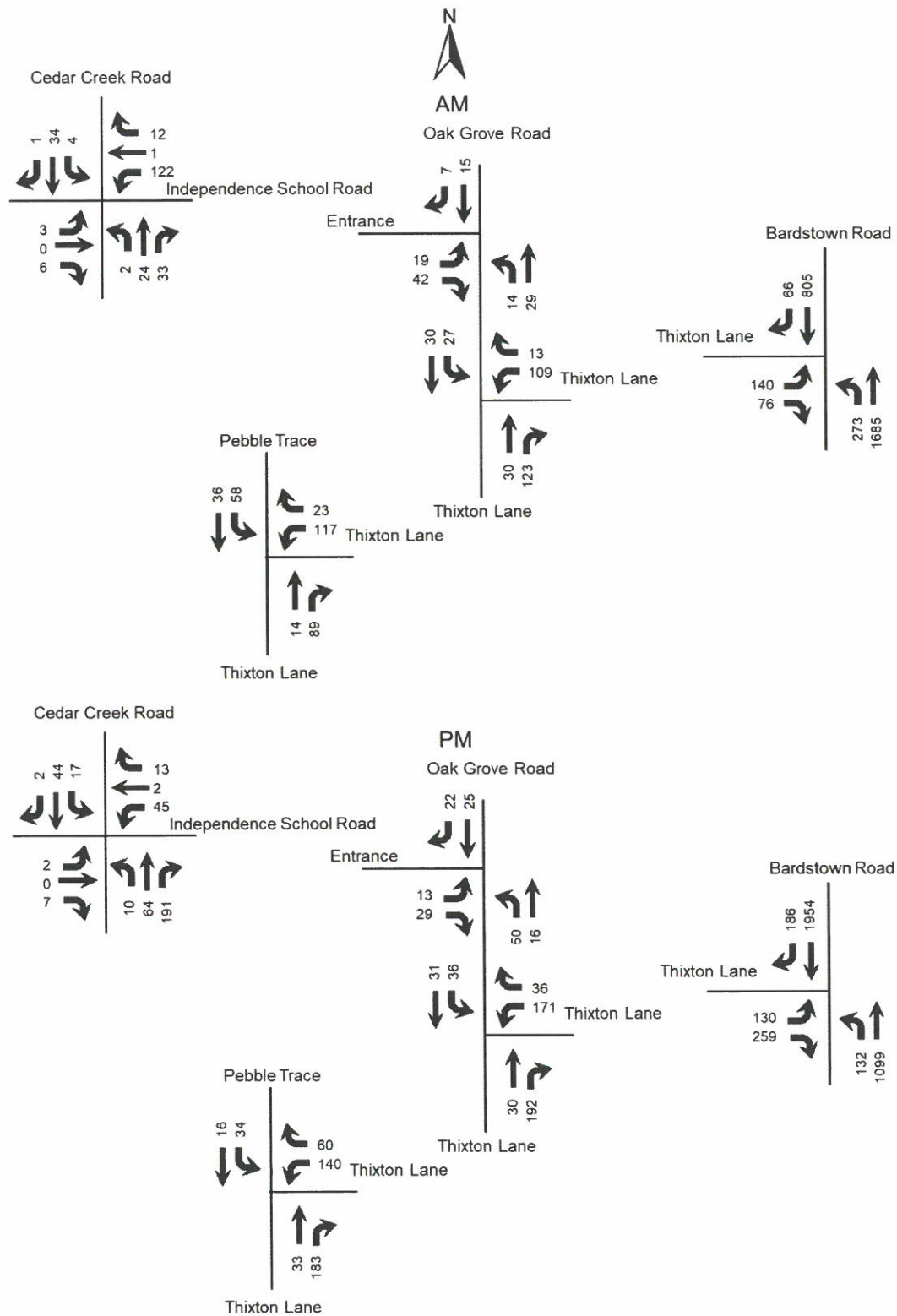


Figure 6. 2027 Build Peak Hour Volumes



## ANALYSIS

The qualitative measure of operation for a roadway facility or intersection is evaluated by assigning a "Level of Service". Level of Service is a ranking scale from A through F, "A" is the best operating condition and "F" is the worst. Level of Service results depend upon the facility that is analyzed. In this case, the Level of Service is based upon the total delay experienced for lanes at stop-controlled intersections.

To evaluate the impact of the proposed development, the vehicle delays at the intersections were determined using procedures detailed in the Highway Capacity Manual, 6<sup>th</sup> edition. Future delays and Level of Service were determined for the intersections using the HCS Streets (version 7.9.5) software. The delays and Level of Service are summarized in **Table 2**.

**Table 2. Peak Hour Level of Service**

| Approach                                       | A.M.          |               |            | P.M.          |               |            |
|------------------------------------------------|---------------|---------------|------------|---------------|---------------|------------|
|                                                | 2021 Existing | 2027 No Build | 2027 Build | 2021 Existing | 2027 No Build | 2027 Build |
| <b>Cedar Creek Road at Independence School</b> |               |               |            |               |               |            |
| Independence School Road Eastbound             | A<br>8.8      | A<br>8.9      | A<br>8.9   | A<br>9.1      | A<br>9.2      | A<br>9.2   |
| Independence School Road Westbound             | B<br>10.1     | B<br>10.4     | B<br>10.7  | B<br>10.9     | B<br>11.3     | B<br>11.7  |
| Cedar Creek Road Northbound                    | A<br>7.3      | A<br>7.3      | A<br>7.3   | A<br>7.3      | A<br>7.3      | A<br>7.3   |
| Cedar Creek Road Southbound                    | A<br>7.7      | A<br>7.7      | A<br>7.6   | A<br>7.9      | A<br>8.0      | A<br>8.1   |
| <b>Oak Grove Road at Thixton Lane</b>          |               |               |            |               |               |            |
| Thixton Lane Westbound                         | A<br>9.5      | A<br>9.6      | B<br>10.5  | B<br>10.0     | B<br>10.2     | B<br>11.9  |
| Oak Grove Road Southbound                      | A<br>8.1      | A<br>8.2      | A<br>8.4   | A<br>7.8      | A<br>7.8      | A<br>7.8   |
| <b>Oak Grove Road at Entrance</b>              |               |               |            |               |               |            |
| Oak Grove Road Westbound                       |               |               | A<br>8.8   |               |               | A<br>9.3   |
| Oak Grove Road Southbound                      |               |               | A<br>7.4   |               |               | A<br>7.4   |
| <b>Thixton Lane at Pebble Trace</b>            |               |               |            |               |               |            |
| Thixton Lane Eastbound                         | A<br>7.4      | A<br>7.5      | A<br>7.5   | A<br>7.6      | A<br>7.7      | A<br>7.8   |
| Pebble Trace Southbound                        | A<br>9.7      | A<br>9.8      | B<br>10.4  | B<br>10.4     | B<br>10.6     | B<br>11.5  |
| <b>Bardstown Road at Thixton Lane</b>          |               |               |            |               |               |            |
| Thixton Lane Eastbound                         | D<br>43.3     | D<br>44.4     | E<br>68.4  | E<br>64.8     | E<br>69.1     | E<br>67.3  |



|                           | A.M.             |                  |               | P.M.             |                  |               |
|---------------------------|------------------|------------------|---------------|------------------|------------------|---------------|
| Approach                  | 2021<br>Existing | 2027<br>No Build | 2027<br>Build | 2021<br>Existing | 2027<br>No Build | 2027<br>Build |
| Bardstown Road Northbound | B<br>12.3        | B<br>13.4        | A<br>9.9      | B<br>13.7        | B<br>16.2        | B<br>19.9     |
| Bardstown Road Southbound | B<br>15.4        | B<br>16.3        | B<br>13.0     | C<br>32.6        | D<br>35.4        | D<br>51.3     |

Key: Level of Service, Delay in seconds per vehicle

The entrances were evaluated for turn lanes using the Kentucky Transportation Cabinet Highway Design Guidance Manual dated July, 2020. Using the volumes in Figure 6, no turn lanes are recommended at the entrance on Oak Grove Road. The spreadsheet results for the turn lanes are in the Appendix. The recommended traffic control is that westbound Oak Grove Road be controlled with a stop sign. This is the same traffic control as the intersection of Thixton Lane and Oak Grove Road.

Louisville Metro Transportation Planning staff requested an evaluation of the Bardstown Road intersection at Thixton Lane to include a right turn lane on Thixton Lane. The results are listed in Table 3.

**Table 3. Bardstown Road at Thixton Lane with a right turn lane on Thixton Lane**

|                                       | A.M.              |                                   | P.M.              |                                   |
|---------------------------------------|-------------------|-----------------------------------|-------------------|-----------------------------------|
| Approach                              | 2027<br>Build     | 2027<br>Build<br>Thixton Ln Right | 2027<br>Build     | 2027<br>Build<br>Thixton Ln Right |
| <b>Bardstown Road at Thixton Lane</b> | <b>B<br/>14.9</b> | <b>B<br/>10.7</b>                 | <b>D<br/>42.7</b> | <b>C<br/>23.5</b>                 |
| Thixton Lane Eastbound                | E<br>68.4         | D<br>52.0                         | E<br>67.3         | E<br>64.7                         |
| Bardstown Road Northbound             | A<br>9.9          | A<br>6.7                          | B<br>19.9         | B<br>11.9                         |
| Bardstown Road Southbound             | B<br>13.0         | A<br>9.4                          | D<br>51.3         | C<br>22.6                         |

## CONCLUSIONS

Based upon the volume of traffic generated by the development and the amount of traffic forecasted for the year 2027, there will be a slight impact to the existing highway network. No improvements are required.



## **APPENDIX**



# Oak Grove Subdivision Traffic Impact Study

## Traffic Counts

### Classified Turn Movement Count || All vehicles

Jefferson County, KY



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#### Site 4 of 4

Cedar Creek Rd (South)  
Cedar Creek Rd (North)  
Independence School Rd (West)  
Independence School Rd (East)

#### Date

Tuesday, August 24, 2021

#### Weather

Fair  
87°F

#### Lat/Long

38.104664°, -85.607391°

#### 0700 - 0900 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound             |             |              |               |              | Southbound             |             |              |               |              | Eastbound                     |              |               |                |              | Westbound                     |              |               |                |              | Int<br>Total |
|----------------|------------------------|-------------|--------------|---------------|--------------|------------------------|-------------|--------------|---------------|--------------|-------------------------------|--------------|---------------|----------------|--------------|-------------------------------|--------------|---------------|----------------|--------------|--------------|
|                | Cedar Creek Rd (South) |             |              |               |              | Cedar Creek Rd (North) |             |              |               |              | Independence School Rd (West) |              |               |                |              | Independence School Rd (East) |              |               |                |              |              |
|                | Left<br>4.1            | Thru<br>4.2 | Right<br>4.3 | U-Turn<br>4.4 | App<br>Total | Left<br>4.5            | Thru<br>4.6 | Right<br>4.7 | U-Turn<br>4.8 | App<br>Total | Left<br>4.9                   | Thru<br>4.10 | Right<br>4.11 | U-Turn<br>4.12 | App<br>Total | Left<br>4.13                  | Thru<br>4.14 | Right<br>4.15 | U-Turn<br>4.16 | App<br>Total |              |
| 0700 - 0715    | 0                      | 5           | 3            | 0             | 8            | 1                      | 6           | 0            | 0             | 7            | 0                             | 1            | 3             | 0              | 4            | 21                            | 0            | 2             | 0              | 23           | 42           |
| 0715 - 0730    | 1                      | 2           | 3            | 0             | 6            | 1                      | 5           | 0            | 0             | 6            | 0                             | 0            | 1             | 0              | 1            | 22                            | 0            | 2             | 0              | 24           | 37           |
| 0730 - 0745    | 2                      | 7           | 3            | 0             | 12           | 0                      | 11          | 0            | 0             | 11           | 0                             | 0            | 3             | 0              | 3            | 46                            | 0            | 2             | 0              | 48           | 74           |
| 0745 - 0800    | 0                      | 3           | 7            | 0             | 10           | 0                      | 1           | 0            | 0             | 1            | 0                             | 0            | 0             | 0              | 0            | 16                            | 1            | 3             | 0              | 20           | 31           |
| Hourly Total   | 3                      | 17          | 16           | 0             | 36           | 2                      | 23          | 0            | 0             | 25           | 0                             | 1            | 7             | 0              | 8            | 105                           | 1            | 9             | 0              | 115          | 184          |
| 0800 - 0815    | 0                      | 5           | 6            | 0             | 11           | 3                      | 6           | 1            | 0             | 10           | 2                             | 0            | 2             | 0              | 4            | 19                            | 0            | 2             | 0              | 21           | 46           |
| 0815 - 0830    | 0                      | 6           | 8            | 0             | 14           | 0                      | 12          | 0            | 0             | 12           | 1                             | 0            | 1             | 0              | 2            | 12                            | 0            | 2             | 0              | 14           | 42           |
| 0830 - 0845    | 0                      | 7           | 5            | 0             | 12           | 0                      | 7           | 0            | 0             | 7            | 0                             | 0            | 0             | 0              | 0            | 7                             | 0            | 3             | 0              | 10           | 29           |
| 0845 - 0900    | 0                      | 2           | 9            | 0             | 11           | 1                      | 13          | 0            | 0             | 14           | 0                             | 0            | 2             | 0              | 2            | 9                             | 0            | 3             | 0              | 12           | 39           |
| Hourly Total   | 0                      | 20          | 28           | 0             | 48           | 4                      | 38          | 1            | 0             | 43           | 3                             | 0            | 5             | 0              | 8            | 47                            | 0            | 10            | 0              | 57           | 156          |
| Grand Total    | 3                      | 37          | 44           | 0             | 84           | 6                      | 61          | 1            | 0             | 68           | 3                             | 1            | 12            | 0              | 16           | 152                           | 1            | 19            | 0              | 172          | 340          |
| Approach %     | 3.57                   | 44.05       | 52.38        | 0.00          | -            | 8.82                   | 89.71       | 1.47         | 0.00          | -            | 18.75                         | 6.25         | 75.00         | 0.00           | -            | 88.37                         | 0.58         | 11.05         | 0.00           | -            |              |
| Intersection % | 0.88                   | 10.88       | 12.94        | 0.00          | 24.71        | 1.76                   | 17.94       | 0.29         | 0.00          | 20.00        | 0.88                          | 0.29         | 3.53          | 0.00           | 4.71         | 44.71                         | 0.29         | 5.59          | 0.00           | 50.59        |              |
| PHF            | 0.25                   | 0.75        | 0.75         | 0.00          | 0.84         | 0.25                   | 0.63        | 0.25         | 0.00          | 0.71         | 0.38                          | 0.00         | 0.50          | 0.00           | 0.56         | 0.51                          | 0.25         | 0.75          | 0.00           | 0.54         | 0.65         |

#### 1600 - 1800 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound             |       |       |        |           | Southbound             |       |       |        |           | Eastbound                     |      |       |        |           | Westbound                     |      |       |        |           | Int Total |
|----------------|------------------------|-------|-------|--------|-----------|------------------------|-------|-------|--------|-----------|-------------------------------|------|-------|--------|-----------|-------------------------------|------|-------|--------|-----------|-----------|
|                | Cedar Creek Rd (South) |       |       |        |           | Cedar Creek Rd (North) |       |       |        |           | Independence School Rd (West) |      |       |        |           | Independence School Rd (East) |      |       |        |           |           |
|                | Left                   | Thru  | Right | U-Turn | App Total | Left                   | Thru  | Right | U-Turn | App Total | Left                          | Thru | Right | U-Turn | App Total | Left                          | Thru | Right | U-Turn | App Total |           |
| 1600 - 1615    | 3                      | 6     | 26    | 0      | 35        | 3                      | 10    | 2     | 0      | 15        | 0                             | 0    | 1     | 0      | 1         | 15                            | 0    | 2     | 0      | 17        | 68        |
| 1615 - 1630    | 3                      | 11    | 25    | 0      | 39        | 3                      | 7     | 0     | 0      | 10        | 0                             | 0    | 0     | 0      | 0         | 6                             | 1    | 3     | 0      | 10        | 59        |
| 1630 - 1645    | 1                      | 17    | 50    | 0      | 68        | 3                      | 19    | 2     | 0      | 24        | 1                             | 0    | 1     | 0      | 2         | 12                            | 0    | 4     | 0      | 16        | 110       |
| 1645 - 1700    | 1                      | 6     | 35    | 0      | 42        | 2                      | 6     | 0     | 0      | 8         | 1                             | 0    | 1     | 0      | 2         | 10                            | 1    | 4     | 0      | 15        | 67        |
| Hourly Total   | 8                      | 40    | 136   | 0      | 184       | 11                     | 42    | 4     | 0      | 57        | 2                             | 0    | 3     | 0      | 5         | 43                            | 2    | 13    | 0      | 58        | 304       |
| 1700 - 1715    | 5                      | 20    | 37    | 0      | 62        | 4                      | 8     | 0     | 0      | 12        | 0                             | 0    | 5     | 0      | 5         | 6                             | 1    | 1     | 0      | 8         | 87        |
| 1715 - 1730    | 3                      | 14    | 30    | 0      | 47        | 4                      | 6     | 0     | 0      | 10        | 0                             | 0    | 0     | 0      | 0         | 3                             | 0    | 0     | 0      | 3         | 60        |
| 1730 - 1745    | 2                      | 8     | 22    | 0      | 32        | 2                      | 7     | 2     | 0      | 11        | 1                             | 0    | 4     | 0      | 5         | 7                             | 0    | 4     | 0      | 11        | 59        |
| 1745 - 1800    | 4                      | 4     | 17    | 0      | 25        | 1                      | 7     | 1     | 0      | 9         | 3                             | 0    | 2     | 0      | 5         | 5                             | 0    | 2     | 0      | 7         | 46        |
| Hourly Total   | 14                     | 46    | 106   | 0      | 166       | 11                     | 28    | 3     | 0      | 42        | 4                             | 0    | 11    | 0      | 15        | 21                            | 1    | 7     | 0      | 29        | 252       |
| Grand Total    | 22                     | 86    | 242   | 0      | 350       | 22                     | 70    | 7     | 0      | 99        | 6                             | 0    | 14    | 0      | 20        | 64                            | 3    | 20    | 0      | 87        | 556       |
| Approach %     | 6.29                   | 24.57 | 69.14 | 0.00   | -         | 22.22                  | 70.71 | 7.07  | 0.00   | -         | 30.00                         | 0.00 | 70.00 | 0.00   | -         | 73.56                         | 3.45 | 22.99 | 0.00   | -         |           |
| Intersection % | 3.96                   | 15.47 | 43.53 | 0.00   | 62.95     | 3.96                   | 12.59 | 1.26  | 0.00   | 17.81     | 1.08                          | 0.00 | 2.52  | 0.00   | 3.60      | 11.51                         | 0.54 | 3.60  | 0.00   | 15.65     |           |
| PHF            | 0.50                   | 0.71  | 0.76  | 0.00   | 0.81      | 0.81                   | 0.51  | 0.25  | 0.00   | 0.56      | 0.50                          | 0.00 | 0.35  | 0.00   | 0.45      | 0.65                          | 0.50 | 0.56  | 0.00   | 0.66      | 0.74      |



# Oak Grove Subdivision Traffic Impact Study

## Classified Turn Movement Count || All vehicles

Jefferson County, KY



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### Site 2 of 4

KY-2053 Thixton Ln (South)  
Oak Grove Rd

### Date

Tuesday, August 24, 2021

### Weather

Fair  
87°F

### Lat/Long

38.09235°, -85.593529°

### 0700 - 0900 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound                 |       |        |       | Southbound   |       |        |      |
|----------------|----------------------------|-------|--------|-------|--------------|-------|--------|------|
|                | KY-2053 Thixton Ln (South) |       |        |       | Oak Grove Rd |       |        |      |
|                | Thru                       | Right | U-Turn | App   | Left         | Thru  | U-Turn | App  |
| 0700 - 0715    | 4                          | 26    | 0      | 30    | 0            | 3     | 0      | 3    |
| 0715 - 0730    | 6                          | 29    | 0      | 35    | 0            | 5     | 0      | 5    |
| 0730 - 0745    | 6                          | 18    | 0      | 24    | 1            | 1     | 0      | 2    |
| 0745 - 0800    | 6                          | 18    | 0      | 24    | 1            | 4     | 0      | 5    |
| Hourly Total   | 22                         | 91    | 0      | 113   | 2            | 13    | 0      | 15   |
| 0800 - 0815    | 6                          | 24    | 0      | 30    | 1            | 2     | 0      | 3    |
| 0815 - 0830    | 2                          | 18    | 0      | 20    | 1            | 3     | 0      | 4    |
| 0830 - 0845    | 3                          | 22    | 0      | 25    | 0            | 2     | 0      | 2    |
| 0845 - 0900    | 1                          | 20    | 0      | 21    | 1            | 3     | 0      | 4    |
| Hourly Total   | 12                         | 84    | 0      | 96    | 3            | 10    | 0      | 13   |
| Grand Total    | 34                         | 175   | 0      | 209   | 5            | 23    | 0      | 28   |
| Approach %     | 16.27                      | 83.73 | 0.00   | -     | 17.86        | 82.14 | 0.00   | -    |
| Intersection % | 8.81                       | 45.34 | 0.00   | 54.15 | 1.30         | 5.96  | 0.00   | 7.25 |
| PHF            | 1.00                       | 0.77  | 0.00   | 0.81  | 0.75         | 0.60  | 0.00   | 0.75 |

| Westbound                 |       |        |       |       |
|---------------------------|-------|--------|-------|-------|
| KY-2053 Thixton Ln (East) |       |        |       |       |
| Left                      | Right | U-Turn | App   | Int   |
| 2.7                       | 2.8   | 2.9    | Total | Total |
| 13                        | 2     | 0      | 15    | 48    |
| 14                        | 1     | 0      | 15    | 55    |
| 30                        | 2     | 0      | 32    | 58    |
| 20                        | 2     | 0      | 22    | 51    |
| 77                        | 7     | 0      | 84    | 212   |
| 26                        | 0     | 0      | 26    | 59    |
| 16                        | 2     | 0      | 18    | 42    |
| 8                         | 0     | 0      | 8     | 35    |
| 12                        | 1     | 0      | 13    | 38    |
| 62                        | 3     | 0      | 65    | 174   |
| 139                       | 10    | 0      | 149   | 386   |
| 93.29                     | 6.71  | 0.00   | -     |       |
| 36.01                     | 2.59  | 0.00   | 38.60 |       |
| 0.75                      | 0.63  | 0.00   | 0.74  | 0.94  |

### 1600 - 1800 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound                 |       |        |       | Southbound   |       |        |       |
|----------------|----------------------------|-------|--------|-------|--------------|-------|--------|-------|
|                | KY-2053 Thixton Ln (South) |       |        |       | Oak Grove Rd |       |        |       |
|                | Thru                       | Right | U-Turn | App   | Left         | Thru  | U-Turn | App   |
| 1600 - 1615    | 3                          | 29    | 0      | 32    | 3            | 6     | 0      | 9     |
| 1615 - 1630    | 1                          | 24    | 0      | 25    | 2            | 8     | 0      | 10    |
| 1630 - 1645    | 6                          | 43    | 0      | 49    | 3            | 5     | 0      | 8     |
| 1645 - 1700    | 1                          | 45    | 0      | 46    | 1            | 1     | 0      | 2     |
| Hourly Total   | 11                         | 141   | 0      | 152   | 9            | 20    | 0      | 29    |
| 1700 - 1715    | 1                          | 37    | 0      | 38    | 2            | 7     | 0      | 9     |
| 1715 - 1730    | 1                          | 32    | 0      | 33    | 0            | 6     | 0      | 6     |
| 1730 - 1745    | 3                          | 29    | 0      | 32    | 3            | 6     | 0      | 9     |
| 1745 - 1800    | 4                          | 23    | 0      | 27    | 2            | 5     | 0      | 7     |
| Hourly Total   | 9                          | 121   | 0      | 130   | 7            | 24    | 0      | 31    |
| Grand Total    | 20                         | 262   | 0      | 282   | 16           | 44    | 0      | 60    |
| Approach %     | 7.09                       | 92.91 | 0.00   | -     | 26.67        | 73.33 | 0.00   | -     |
| Intersection % | 3.44                       | 45.09 | 0.00   | 48.54 | 2.75         | 7.57  | 0.00   | 10.33 |
| PHF            | 0.38                       | 0.87  | 0.00   | 0.85  | 0.50         | 0.68  | 0.00   | 0.69  |

| Westbound                 |       |        |       |       |
|---------------------------|-------|--------|-------|-------|
| KY-2053 Thixton Ln (East) |       |        |       |       |
| Left                      | Right | U-Turn | App   | Int   |
| 2.7                       | 2.8   | 2.9    | Total | Total |
| 22                        | 1     | 0      | 23    | 64    |
| 18                        | 0     | 0      | 18    | 53    |
| 30                        | 2     | 0      | 32    | 89    |
| 38                        | 2     | 0      | 40    | 88    |
| 108                       | 5     | 0      | 113   | 294   |
| 32                        | 3     | 0      | 35    | 82    |
| 29                        | 0     | 0      | 29    | 68    |
| 32                        | 0     | 0      | 32    | 73    |
| 30                        | 0     | 0      | 30    | 64    |
| 123                       | 3     | 0      | 126   | 287   |
| 231                       | 8     | 0      | 239   | 581   |
| 96.65                     | 3.35  | 0.00   | -     |       |
| 39.76                     | 1.38  | 0.00   | 41.14 |       |
| 0.85                      | 0.58  | 0.00   | 0.85  | 0.92  |



# Oak Grove Subdivision Traffic Impact Study

## Classified Turn Movement Count || All vehicles

Jefferson County, KY



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### Site 3 of 4

KY-2053 Thixton Ln (South)  
Pebble Trace

KY-2053 Thixton Ln (East)

### Date

Tuesday, August 24, 2021

### Lat/Long

38.089712°, -85.598788°

### Weather

Fair  
87°F

### 0700 - 0900 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound                 |       |        |           | Southbound   |       |        |           |
|----------------|----------------------------|-------|--------|-----------|--------------|-------|--------|-----------|
|                | KY-2053 Thixton Ln (South) |       |        |           | Pebble Trace |       |        |           |
|                | Thru                       | Right | U-Turn | App Total | Left         | Thru  | U-Turn | App Total |
| 0700 - 0715    | 0                          | 20    | 0      | 20        | 11           | 5     | 0      | 16        |
| 0715 - 0730    | 1                          | 18    | 0      | 19        | 11           | 6     | 0      | 17        |
| 0730 - 0745    | 4                          | 17    | 0      | 21        | 8            | 6     | 0      | 14        |
| 0745 - 0800    | 2                          | 19    | 0      | 21        | 6            | 6     | 0      | 12        |
| Hourly Total   | 7                          | 74    | 0      | 81        | 36           | 23    | 0      | 59        |
| 0800 - 0815    | 3                          | 20    | 0      | 23        | 10           | 8     | 0      | 18        |
| 0815 - 0830    | 1                          | 14    | 0      | 15        | 8            | 10    | 0      | 18        |
| 0830 - 0845    | 0                          | 17    | 0      | 17        | 6            | 2     | 0      | 8         |
| 0845 - 0900    | 0                          | 15    | 0      | 15        | 4            | 2     | 0      | 6         |
| Hourly Total   | 4                          | 66    | 0      | 70        | 28           | 22    | 0      | 50        |
| Grand Total    | 11                         | 140   | 0      | 151       | 64           | 45    | 0      | 109       |
| Approach %     | 7.28                       | 92.72 | 0.00   | -         | 58.72        | 41.28 | 0.00   | -         |
| Intersection % | 2.61                       | 33.18 | 0.00   | 35.78     | 15.17        | 10.66 | 0.00   | 25.83     |
| PHF            | 0.63                       | 0.93  | 0.00   | 0.91      | 0.80         | 0.81  | 0.00   | 0.85      |

| Westbound                 |       |        |           |           |
|---------------------------|-------|--------|-----------|-----------|
| KY-2053 Thixton Ln (East) |       |        |           |           |
| Left                      | Right | U-Turn | App Total | Int Total |
| 3.7                       | 3.8   | 3.9    |           |           |
| 12                        | 2     | 0      | 14        | 50        |
| 12                        | 5     | 0      | 17        | 53        |
| 32                        | 2     | 0      | 34        | 69        |
| 20                        | 4     | 0      | 24        | 57        |
| 76                        | 13    | 0      | 89        | 229       |
| 24                        | 4     | 0      | 28        | 69        |
| 17                        | 3     | 0      | 20        | 53        |
| 6                         | 3     | 0      | 9         | 34        |
| 14                        | 2     | 0      | 16        | 37        |
| 61                        | 12    | 0      | 73        | 193       |
| 137                       | 25    | 0      | 162       | 422       |
| 84.57                     | 15.43 | 0.00   | -         |           |
| 32.46                     | 5.92  | 0.00   | 38.39     |           |
| 0.69                      | 0.75  | 0.00   | 0.76      | 0.90      |

### 1600 - 1800 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound                 |       |        |           | Southbound   |       |        |           |
|----------------|----------------------------|-------|--------|-----------|--------------|-------|--------|-----------|
|                | KY-2053 Thixton Ln (South) |       |        |           | Pebble Trace |       |        |           |
|                | Thru                       | Right | U-Turn | App Total | Left         | Thru  | U-Turn | App Total |
| 1600 - 1615    | 1                          | 25    | 0      | 26        | 6            | 1     | 0      | 7         |
| 1615 - 1630    | 3                          | 23    | 0      | 26        | 4            | 4     | 0      | 8         |
| 1630 - 1645    | 7                          | 44    | 0      | 51        | 5            | 2     | 0      | 7         |
| 1645 - 1700    | 4                          | 38    | 0      | 42        | 5            | 2     | 0      | 7         |
| Hourly Total   | 15                         | 130   | 0      | 145       | 20           | 9     | 0      | 29        |
| 1700 - 1715    | 4                          | 33    | 0      | 37        | 4            | 2     | 0      | 6         |
| 1715 - 1730    | 7                          | 29    | 0      | 36        | 5            | 3     | 0      | 8         |
| 1730 - 1745    | 8                          | 29    | 0      | 37        | 4            | 2     | 0      | 6         |
| 1745 - 1800    | 9                          | 22    | 0      | 31        | 5            | 2     | 0      | 7         |
| Hourly Total   | 28                         | 113   | 0      | 141       | 18           | 9     | 0      | 27        |
| Grand Total    | 43                         | 243   | 0      | 286       | 38           | 18    | 0      | 56        |
| Approach %     | 15.03                      | 84.97 | 0.00   | -         | 67.86        | 32.14 | 0.00   | -         |
| Intersection % | 6.97                       | 39.38 | 0.00   | 46.35     | 6.16         | 2.92  | 0.00   | 9.08      |
| PHF            | 0.79                       | 0.82  | 0.00   | 0.81      | 0.95         | 0.75  | 0.00   | 0.88      |

| Westbound                 |       |        |           |           |
|---------------------------|-------|--------|-----------|-----------|
| KY-2053 Thixton Ln (East) |       |        |           |           |
| Left                      | Right | U-Turn | App Total | Int Total |
| 3.7                       | 3.8   | 3.9    |           |           |
| 20                        | 9     | 0      | 29        | 62        |
| 18                        | 7     | 0      | 25        | 59        |
| 30                        | 5     | 0      | 35        | 93        |
| 24                        | 9     | 0      | 33        | 82        |
| 92                        | 30    | 0      | 122       | 296       |
| 29                        | 15    | 0      | 44        | 87        |
| 31                        | 5     | 0      | 36        | 80        |
| 21                        | 17    | 0      | 38        | 81        |
| 26                        | 9     | 0      | 35        | 73        |
| 107                       | 46    | 0      | 153       | 321       |
| 199                       | 76    | 0      | 275       | 617       |
| 72.36                     | 27.64 | 0.00   | -         |           |
| 32.25                     | 12.32 | 0.00   | 44.57     |           |
| 0.92                      | 0.57  | 0.00   | 0.84      | 0.92      |



# Oak Grove Subdivision Traffic Impact Study

## Classified Turn Movement Count || All vehicles

Jefferson County, KY



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### Site 1 of 4

US-150 Bardstown Rd (South)  
US-150 Bardstown Rd (North)  
KY-2053 Thixton Ln

### Date

Tuesday, August 24, 2021

### Weather

Fair  
87°F

### Lat/Long

38.100655°, -85.565656°

### 0700 - 0900 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound                  |       |        |              | Southbound                  |       |        |              | Eastbound          |       |        |              | Int<br>Total |
|----------------|-----------------------------|-------|--------|--------------|-----------------------------|-------|--------|--------------|--------------------|-------|--------|--------------|--------------|
|                | US-150 Bardstown Rd (South) |       |        |              | US-150 Bardstown Rd (North) |       |        |              | KY-2053 Thixton Ln |       |        |              |              |
|                | Left                        | Thru  | U-Turn | App<br>Total | Thru                        | Right | U-Turn | App<br>Total | Left               | Right | U-Turn | App<br>Total |              |
| 0700 - 0715    | 40                          | 455   | 0      | 495          | 178                         | 8     | 0      | 186          | 28                 | 17    | 0      | 45           | 726          |
| 0715 - 0730    | 76                          | 459   | 0      | 535          | 157                         | 9     | 0      | 166          | 30                 | 9     | 0      | 39           | 740          |
| 0730 - 0745    | 75                          | 335   | 0      | 410          | 196                         | 26    | 0      | 222          | 25                 | 14    | 0      | 39           | 671          |
| 0745 - 0800    | 40                          | 338   | 0      | 378          | 227                         | 13    | 1      | 241          | 14                 | 13    | 0      | 27           | 646          |
| Hourly Total   | 231                         | 1587  | 0      | 1818         | 758                         | 56    | 1      | 815          | 97                 | 53    | 0      | 150          | 2783         |
| 0800 - 0815    | 20                          | 336   | 0      | 356          | 198                         | 27    | 0      | 225          | 29                 | 10    | 0      | 39           | 620          |
| 0815 - 0830    | 24                          | 351   | 0      | 375          | 194                         | 16    | 0      | 210          | 26                 | 10    | 0      | 36           | 621          |
| 0830 - 0845    | 17                          | 347   | 0      | 364          | 159                         | 8     | 0      | 167          | 34                 | 13    | 0      | 47           | 578          |
| 0845 - 0900    | 20                          | 308   | 0      | 328          | 169                         | 13    | 0      | 182          | 26                 | 13    | 0      | 39           | 549          |
| Hourly Total   | 81                          | 1342  | 0      | 1423         | 720                         | 64    | 0      | 784          | 115                | 46    | 0      | 161          | 2368         |
| Grand Total    | 312                         | 2929  | 0      | 3241         | 1478                        | 120   | 1      | 1599         | 212                | 99    | 0      | 311          | 5151         |
| Approach %     | 9.63                        | 90.37 | 0.00   | -            | 92.43                       | 7.50  | 0.06   | -            | 68.17              | 31.83 | 0.00   | -            |              |
| Intersection % | 6.06                        | 56.86 | 0.00   | 62.92        | 28.69                       | 2.33  | 0.02   | 31.04        | 4.12               | 1.92  | 0.00   | 6.04         |              |
| PHF            | 0.76                        | 0.86  | 0.00   | 0.85         | 0.83                        | 0.54  | 0.25   | 0.85         | 0.81               | 0.78  | 0.00   | 0.83         | 0.94         |

### 1600 - 1800 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound                  |             |               |              | Southbound                  |              |               |              | Eastbound          |              |               |              | Int<br>Total |
|----------------|-----------------------------|-------------|---------------|--------------|-----------------------------|--------------|---------------|--------------|--------------------|--------------|---------------|--------------|--------------|
|                | US-150 Bardstown Rd (South) |             |               |              | US-150 Bardstown Rd (North) |              |               |              | KY-2053 Thixton Ln |              |               |              |              |
|                | Left<br>1.1                 | Thru<br>1.2 | U-Turn<br>1.3 | App<br>Total | Thru<br>1.4                 | Right<br>1.5 | U-Turn<br>1.6 | App<br>Total | Left<br>1.7        | Right<br>1.8 | U-Turn<br>1.9 | App<br>Total |              |
| 1600 - 1615    | 23                          | 274         | 0             | 297          | 375                         | 37           | 0             | 412          | 23                 | 50           | 0             | 73           | 782          |
| 1615 - 1630    | 18                          | 257         | 0             | 275          | 422                         | 44           | 0             | 466          | 18                 | 44           | 0             | 62           | 803          |
| 1630 - 1645    | 23                          | 258         | 0             | 281          | 426                         | 37           | 0             | 463          | 27                 | 58           | 0             | 85           | 829          |
| 1645 - 1700    | 34                          | 294         | 0             | 328          | 414                         | 40           | 0             | 454          | 35                 | 62           | 0             | 97           | 879          |
| Hourly Total   | 98                          | 1083        | 0             | 1181         | 1637                        | 158          | 0             | 1795         | 103                | 214          | 0             | 317          | 3293         |
| 1700 - 1715    | 22                          | 249         | 0             | 271          | 503                         | 32           | 0             | 535          | 22                 | 43           | 0             | 65           | 871          |
| 1715 - 1730    | 23                          | 240         | 0             | 263          | 441                         | 32           | 0             | 473          | 23                 | 58           | 0             | 81           | 817          |
| 1730 - 1745    | 18                          | 252         | 0             | 270          | 483                         | 33           | 0             | 516          | 26                 | 48           | 0             | 74           | 860          |
| 1745 - 1800    | 19                          | 251         | 0             | 270          | 463                         | 40           | 0             | 503          | 28                 | 34           | 0             | 62           | 835          |
| Hourly Total   | 82                          | 992         | 0             | 1074         | 1890                        | 137          | 0             | 2027         | 99                 | 183          | 0             | 282          | 3383         |
| Grand Total    | 180                         | 2075        | 0             | 2255         | 3527                        | 295          | 0             | 3822         | 202                | 397          | 0             | 599          | 6676         |
| Approach %     | 7.98                        | 92.02       | 0.00          | -            | 92.28                       | 7.72         | 0.00          | -            | 33.72              | 66.28        | 0.00          | -            |              |
| Intersection % | 2.70                        | 31.08       | 0.00          | 33.78        | 52.83                       | 4.42         | 0.00          | 57.25        | 3.03               | 5.95         | 0.00          | 8.97         |              |
| PHF            | 0.71                        | 0.88        | 0.00          | 0.86         | 0.92                        | 0.86         | 0.00          | 0.92         | 0.76               | 0.85         | 0.00          | 0.82         | 0.97         |



## HCS Reports

| HCS7 Two-Way Stop-Control Report                 |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
|--------------------------------------------------|---------------------------------------|------|------|------|-----------|------|------|----------------------------|---------------------------|------|-----|----|------------|------|-----|---|
| General Information                              |                                       |      |      |      |           |      |      | Site Information           |                           |      |     |    |            |      |     |   |
| Analyst                                          | DBZ                                   |      |      |      |           |      |      | Intersection               | Cedar Creek at Ind School |      |     |    |            |      |     |   |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |      |      |      |           |      |      | Jurisdiction               |                           |      |     |    |            |      |     |   |
| Date Performed                                   | 9/19/2021                             |      |      |      |           |      |      | East/West Street           | Independence School Road  |      |     |    |            |      |     |   |
| Analysis Year                                    | 2021                                  |      |      |      |           |      |      | North/South Street         | Cedar Creek Road          |      |     |    |            |      |     |   |
| Time Analyzed                                    | AM Peak                               |      |      |      |           |      |      | Peak Hour Factor           | 0.65                      |      |     |    |            |      |     |   |
| Intersection Orientation                         | North-South                           |      |      |      |           |      |      | Analysis Time Period (hrs) | 0.25                      |      |     |    |            |      |     |   |
| Project Description                              | Oak Grove                             |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Lanes</b>                                     |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <p>Major Street: North-South</p>                 |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Approach                                         | Eastbound                             |      |      |      | Westbound |      |      |                            | Northbound                |      |     |    | Southbound |      |     |   |
| Movement                                         | U                                     | L    | T    | R    | U         | L    | T    | R                          | U                         | L    | T   | R  | U          | L    | T   | R |
| Priority                                         |                                       | 10   | 11   | 12   |           | 7    | 8    | 9                          | 1U                        | 1    | 2   | 3  | 4U         | 4    | 5   | 6 |
| Number of Lanes                                  |                                       | 0    | 1    | 0    |           | 0    | 1    | 0                          | 0                         | 0    | 1   | 0  | 0          | 0    | 1   | 0 |
| Configuration                                    |                                       |      | LTR  |      |           |      | LTR  |                            |                           |      | LTR |    |            |      | LTR |   |
| Volume (veh/h)                                   |                                       | 3    | 0    | 6    |           | 93   | 1    | 9                          |                           | 2    | 21  | 24 |            | 3    | 30  | 1 |
| Percent Heavy Vehicles (%)                       |                                       | 0    | 0    | 0    |           | 1    | 0    | 0                          |                           | 0    |     |    |            | 33   |     |   |
| Proportion Time Blocked                          |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Percent Grade (%)                                | 0                                     |      |      |      | 0         |      |      |                            |                           |      |     |    |            |      |     |   |
| Right Turn Channelized                           |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Median Type   Storage                            | Undivided                             |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Critical and Follow-up Headways</b>           |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Base Critical Headway (sec)                      |                                       | 7.1  | 6.5  | 6.2  |           | 7.1  | 6.5  | 6.2                        |                           | 4.1  |     |    |            | 4.1  |     |   |
| Critical Headway (sec)                           |                                       | 7.10 | 6.50 | 6.20 |           | 7.11 | 6.50 | 6.20                       |                           | 4.10 |     |    |            | 4.43 |     |   |
| Base Follow-Up Headway (sec)                     |                                       | 3.5  | 4.0  | 3.3  |           | 3.5  | 4.0  | 3.3                        |                           | 2.2  |     |    |            | 2.2  |     |   |
| Follow-Up Headway (sec)                          |                                       | 3.50 | 4.00 | 3.30 |           | 3.51 | 4.00 | 3.30                       |                           | 2.20 |     |    |            | 2.50 |     |   |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Flow Rate, v (veh/h)                             |                                       |      | 14   |      |           |      | 158  |                            |                           | 3    |     |    |            | 5    |     |   |
| Capacity, c (veh/h)                              |                                       |      | 958  |      |           |      | 861  |                            |                           | 1573 |     |    |            | 1356 |     |   |
| v/c Ratio                                        |                                       |      | 0.01 |      |           |      | 0.18 |                            |                           | 0.00 |     |    |            | 0.00 |     |   |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |      | 0.0  |      |           |      | 0.7  |                            |                           | 0.0  |     |    |            | 0.0  |     |   |
| Control Delay (s/veh)                            |                                       |      | 8.8  |      |           |      | 10.1 |                            |                           | 7.3  |     |    |            | 7.7  |     |   |
| Level of Service (LOS)                           |                                       |      | A    |      |           |      | B    |                            |                           | A    |     |    |            | A    |     |   |
| Approach Delay (s/veh)                           | 8.8                                   |      |      |      | 10.1      |      |      |                            | 0.3                       |      |     |    | 0.7        |      |     |   |
| Approach LOS                                     | A                                     |      |      |      | B         |      |      |                            |                           |      |     |    |            |      |     |   |



Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Two-Way Stop-Control Report                             |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
|--------------------------------------------------------------|---------------------------------------|------|------|------|-----------|------|------|----------------------------|---------------------------|------|-----|----|------------|------|-----|---|
| General Information                                          |                                       |      |      |      |           |      |      | Site Information           |                           |      |     |    |            |      |     |   |
| Analyst                                                      | DBZ                                   |      |      |      |           |      |      | Intersection               | Cedar Creek at Ind School |      |     |    |            |      |     |   |
| Agency/Co.                                                   | Diane B Zimmerman Traffic Engineering |      |      |      |           |      |      | Jurisdiction               |                           |      |     |    |            |      |     |   |
| Date Performed                                               | 9/19/2021                             |      |      |      |           |      |      | East/West Street           | Independence School Road  |      |     |    |            |      |     |   |
| Analysis Year                                                | 2027                                  |      |      |      |           |      |      | North/South Street         | Cedar Creek Road          |      |     |    |            |      |     |   |
| Time Analyzed                                                | AM Peak No Build                      |      |      |      |           |      |      | Peak Hour Factor           | 0.65                      |      |     |    |            |      |     |   |
| Intersection Orientation                                     | North-South                           |      |      |      |           |      |      | Analysis Time Period (hrs) | 0.25                      |      |     |    |            |      |     |   |
| Project Description                                          | Oak Grove                             |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Lanes</b>                                                 |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <p style="text-align: center;">Major Street: North-South</p> |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Vehicle Volumes and Adjustments</b>                       |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Approach                                                     | Eastbound                             |      |      |      | Westbound |      |      |                            | Northbound                |      |     |    | Southbound |      |     |   |
| Movement                                                     | U                                     | L    | T    | R    | U         | L    | T    | R                          | U                         | L    | T   | R  | U          | L    | T   | R |
| Priority                                                     |                                       | 10   | 11   | 12   |           | 7    | 8    | 9                          | 10                        | 1    | 2   | 3  | 4          | 5    | 6   |   |
| Number of Lanes                                              |                                       | 0    | 1    | 0    |           | 0    | 1    | 0                          | 0                         | 0    | 1   | 0  | 0          | 0    | 1   | 0 |
| Configuration                                                |                                       |      | LTR  |      |           |      | LTR  |                            |                           |      | LTR |    |            |      | LTR |   |
| Volume (veh/h)                                               |                                       | 3    | 0    | 6    |           | 105  | 1    | 10                         |                           | 2    | 24  | 27 |            | 3    | 34  | 1 |
| Percent Heavy Vehicles (%)                                   |                                       | 0    | 0    | 0    |           | 1    | 0    | 0                          |                           | 0    |     |    |            | 33   |     |   |
| Proportion Time Blocked                                      |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Percent Grade (%)                                            | 0                                     |      |      |      | 0         |      |      |                            |                           |      |     |    |            |      |     |   |
| Right Turn Channelized                                       |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Median Type   Storage                                        | Undivided                             |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Critical and Follow-up Headways</b>                       |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Base Critical Headway (sec)                                  |                                       | 7.1  | 6.5  | 6.2  |           | 7.1  | 6.5  | 6.2                        |                           | 4.1  |     |    |            | 4.1  |     |   |
| Critical Headway (sec)                                       |                                       | 7.10 | 6.50 | 6.20 |           | 7.11 | 6.50 | 6.20                       |                           | 4.10 |     |    |            | 4.43 |     |   |
| Base Follow-Up Headway (sec)                                 |                                       | 3.5  | 4.0  | 3.3  |           | 3.5  | 4.0  | 3.3                        |                           | 2.2  |     |    |            | 2.2  |     |   |
| Follow-Up Headway (sec)                                      |                                       | 3.50 | 4.00 | 3.30 |           | 3.51 | 4.00 | 3.30                       |                           | 2.20 |     |    |            | 2.50 |     |   |
| <b>Delay, Queue Length, and Level of Service</b>             |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Flow Rate, v (veh/h)                                         |                                       |      | 14   |      |           |      | 178  |                            |                           | 3    |     |    |            | 5    |     |   |
| Capacity, c (veh/h)                                          |                                       |      | 945  |      |           |      | 845  |                            |                           | 1564 |     |    |            | 1345 |     |   |
| v/c Ratio                                                    |                                       |      | 0.01 |      |           |      | 0.21 |                            |                           | 0.00 |     |    |            | 0.00 |     |   |
| 95% Queue Length, Q <sub>95</sub> (veh)                      |                                       |      | 0.0  |      |           |      | 0.8  |                            |                           | 0.0  |     |    |            | 0.0  |     |   |
| Control Delay (s/veh)                                        |                                       |      | 8.9  |      |           |      | 10.4 |                            |                           | 7.3  |     |    |            | 7.7  |     |   |
| Level of Service (LOS)                                       |                                       |      | A    |      |           |      | B    |                            |                           | A    |     |    |            | A    |     |   |
| Approach Delay (s/veh)                                       | 8.9                                   |      |      |      | 10.4      |      |      |                            | 0.3                       |      |     |    | 0.6        |      |     |   |
| Approach LOS                                                 | A                                     |      |      |      | B         |      |      |                            |                           |      |     |    |            |      |     |   |

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Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Two-Way Stop-Control Report                 |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
|--------------------------------------------------|---------------------------------------|------|------|------|-----------|------|------|----------------------------|---------------------------|------|-----|----|------------|------|-----|---|
| General Information                              |                                       |      |      |      |           |      |      | Site Information           |                           |      |     |    |            |      |     |   |
| Analyst                                          | DBZ                                   |      |      |      |           |      |      | Intersection               | Cedar Creek at Ind School |      |     |    |            |      |     |   |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |      |      |      |           |      |      | Jurisdiction               |                           |      |     |    |            |      |     |   |
| Date Performed                                   | 5/9/2022                              |      |      |      |           |      |      | East/West Street           | Independence School Road  |      |     |    |            |      |     |   |
| Analysis Year                                    | 2027                                  |      |      |      |           |      |      | North/South Street         | Cedar Creek Road          |      |     |    |            |      |     |   |
| Time Analyzed                                    | AM Peak Build                         |      |      |      |           |      |      | Peak Hour Factor           | 0.65                      |      |     |    |            |      |     |   |
| Intersection Orientation                         | North-South                           |      |      |      |           |      |      | Analysis Time Period (hrs) | 0.25                      |      |     |    |            |      |     |   |
| Project Description                              | Oak Grove                             |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Lanes</b>                                     |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
|                                                  |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Approach                                         | Eastbound                             |      |      |      | Westbound |      |      |                            | Northbound                |      |     |    | Southbound |      |     |   |
| Movement                                         | U                                     | L    | T    | R    | U         | L    | T    | R                          | U                         | L    | T   | R  | U          | L    | T   | R |
| Priority                                         |                                       | 10   | 11   | 12   |           | 7    | 8    | 9                          | 1U                        | 1    | 2   | 3  | 4U         | 4    | 5   | 6 |
| Number of Lanes                                  |                                       | 0    | 1    | 0    |           | 0    | 1    | 0                          | 0                         | 0    | 1   | 0  | 0          | 0    | 1   | 0 |
| Configuration                                    |                                       |      | LTR  |      |           |      | LTR  |                            |                           |      | LTR |    |            |      | LTR |   |
| Volume (veh/h)                                   |                                       | 3    | 0    | 6    |           | 122  | 1    | 12                         |                           | 2    | 24  | 33 |            | 4    | 34  | 1 |
| Percent Heavy Vehicles (%)                       |                                       | 0    | 0    | 0    |           | 1    | 0    | 0                          |                           | 0    |     |    |            | 25   |     |   |
| Proportion Time Blocked                          |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Percent Grade (%)                                | 0                                     |      |      |      | 0         |      |      |                            |                           |      |     |    |            |      |     |   |
| Right Turn Channelized                           |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Median Type   Storage                            | Undivided                             |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Critical and Follow-up Headways</b>           |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Base Critical Headway (sec)                      |                                       | 7.1  | 6.5  | 6.2  |           | 7.1  | 6.5  | 6.2                        |                           | 4.1  |     |    |            | 4.1  |     |   |
| Critical Headway (sec)                           |                                       | 7.10 | 6.50 | 6.20 |           | 7.11 | 6.50 | 6.20                       |                           | 4.10 |     |    |            | 4.35 |     |   |
| Base Follow-Up Headway (sec)                     |                                       | 3.5  | 4.0  | 3.3  |           | 3.5  | 4.0  | 3.3                        |                           | 2.2  |     |    |            | 2.2  |     |   |
| Follow-Up Headway (sec)                          |                                       | 3.50 | 4.00 | 3.30 |           | 3.51 | 4.00 | 3.30                       |                           | 2.20 |     |    |            | 2.43 |     |   |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Flow Rate, v (veh/h)                             |                                       |      | 14   |      |           |      | 208  |                            |                           | 3    |     |    |            | 6    |     |   |
| Capacity, c (veh/h)                              |                                       |      | 939  |      |           |      | 836  |                            |                           | 1564 |     |    |            | 1375 |     |   |
| v/c Ratio                                        |                                       |      | 0.01 |      |           |      | 0.25 |                            |                           | 0.00 |     |    |            | 0.00 |     |   |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |      | 0.0  |      |           |      | 1.0  |                            |                           | 0.0  |     |    |            | 0.0  |     |   |
| Control Delay (s/veh)                            |                                       |      | 8.9  |      |           |      | 10.7 |                            |                           | 7.3  |     |    |            | 7.6  |     |   |
| Level of Service (LOS)                           |                                       |      | A    |      |           |      | B    |                            |                           | A    |     |    |            | A    |     |   |
| Approach Delay (s/veh)                           | 8.9                                   |      |      |      | 10.7      |      |      |                            | 0.3                       |      |     |    | 0.8        |      |     |   |
| Approach LOS                                     | A                                     |      |      |      | B         |      |      |                            |                           |      |     |    |            |      |     |   |

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Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Two-Way Stop-Control Report                 |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
|--------------------------------------------------|---------------------------------------|------|------|------|-----------|------|------|----------------------------|---------------------------|------|-----|-----|------------|------|-----|---|
| General Information                              |                                       |      |      |      |           |      |      | Site Information           |                           |      |     |     |            |      |     |   |
| Analyst                                          | DBZ                                   |      |      |      |           |      |      | Intersection               | Cedar Creek at Ind School |      |     |     |            |      |     |   |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |      |      |      |           |      |      | Jurisdiction               |                           |      |     |     |            |      |     |   |
| Date Performed                                   | 9/19/2021                             |      |      |      |           |      |      | East/West Street           | Independence School Road  |      |     |     |            |      |     |   |
| Analysis Year                                    | 2021                                  |      |      |      |           |      |      | North/South Street         | Cedar Creek Road          |      |     |     |            |      |     |   |
| Time Analyzed                                    | PM Peak                               |      |      |      |           |      |      | Peak Hour Factor           | 0.74                      |      |     |     |            |      |     |   |
| Intersection Orientation                         | North-South                           |      |      |      |           |      |      | Analysis Time Period (hrs) | 0.25                      |      |     |     |            |      |     |   |
| Project Description                              | Oak Grove                             |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| <b>Lanes</b>                                     |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| <p>Major Street: North-South</p>                 |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Approach                                         | Eastbound                             |      |      |      | Westbound |      |      |                            | Northbound                |      |     |     | Southbound |      |     |   |
| Movement                                         | U                                     | L    | T    | R    | U         | L    | T    | R                          | U                         | L    | T   | R   | U          | L    | T   | R |
| Priority                                         |                                       | 10   | 11   | 12   |           | 7    | 8    | 9                          | 1U                        | 1    | 2   | 3   | 4U         | 4    | 5   | 6 |
| Number of Lanes                                  |                                       | 0    | 1    | 0    |           | 0    | 1    | 0                          | 0                         | 0    | 1   | 0   | 0          | 0    | 1   | 0 |
| Configuration                                    |                                       |      | LTR  |      |           |      | LTR  |                            |                           |      | LTR |     |            |      | LTR |   |
| Volume (veh/h)                                   |                                       | 2    | 0    | 7    |           | 31   | 2    | 9                          |                           | 10   | 57  | 152 |            | 13   | 39  | 2 |
| Percent Heavy Vehicles (%)                       |                                       | 0    | 0    | 0    |           | 0    | 0    | 11                         |                           | 0    |     |     |            | 8    |     |   |
| Proportion Time Blocked                          |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Percent Grade (%)                                | 0                                     |      |      |      | 0         |      |      |                            |                           |      |     |     |            |      |     |   |
| Right Turn Channelized                           |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Median Type   Storage                            | Undivided                             |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| <b>Critical and Follow-up Headways</b>           |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Base Critical Headway (sec)                      |                                       | 7.1  | 6.5  | 6.2  |           | 7.1  | 6.5  | 6.2                        |                           | 4.1  |     |     |            | 4.1  |     |   |
| Critical Headway (sec)                           |                                       | 7.10 | 6.50 | 6.20 |           | 7.10 | 6.50 | 6.31                       |                           | 4.10 |     |     |            | 4.18 |     |   |
| Base Follow-Up Headway (sec)                     |                                       | 3.5  | 4.0  | 3.3  |           | 3.5  | 4.0  | 3.3                        |                           | 2.2  |     |     |            | 2.2  |     |   |
| Follow-Up Headway (sec)                          |                                       | 3.50 | 4.00 | 3.30 |           | 3.50 | 4.00 | 3.40                       |                           | 2.20 |     |     |            | 2.27 |     |   |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Flow Rate, v (veh/h)                             |                                       |      | 12   |      |           |      | 57   |                            |                           | 14   |     |     |            | 18   |     |   |
| Capacity, c (veh/h)                              |                                       |      | 895  |      |           |      | 670  |                            |                           | 1562 |     |     |            | 1246 |     |   |
| v/c Ratio                                        |                                       |      | 0.01 |      |           |      | 0.08 |                            |                           | 0.01 |     |     |            | 0.01 |     |   |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |      | 0.0  |      |           |      | 0.3  |                            |                           | 0.0  |     |     |            | 0.0  |     |   |
| Control Delay (s/veh)                            |                                       |      | 9.1  |      |           |      | 10.9 |                            |                           | 7.3  |     |     |            | 7.9  |     |   |
| Level of Service (LOS)                           |                                       |      | A    |      |           |      | B    |                            |                           | A    |     |     |            | A    |     |   |
| Approach Delay (s/veh)                           | 9.1                                   |      |      |      | 10.9      |      |      |                            | 0.4                       |      |     |     | 2.0        |      |     |   |
| Approach LOS                                     | A                                     |      |      |      | B         |      |      |                            |                           |      |     |     |            |      |     |   |

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Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Two-Way Stop-Control Report                 |                                       |      |      |      |           |      |      |                            |                           |      |      |     |            |      |      |   |
|--------------------------------------------------|---------------------------------------|------|------|------|-----------|------|------|----------------------------|---------------------------|------|------|-----|------------|------|------|---|
| General Information                              |                                       |      |      |      |           |      |      | Site Information           |                           |      |      |     |            |      |      |   |
| Analyst                                          | DBZ                                   |      |      |      |           |      |      | Intersection               | Cedar Creek at Ind School |      |      |     |            |      |      |   |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |      |      |      |           |      |      | Jurisdiction               |                           |      |      |     |            |      |      |   |
| Date Performed                                   | 9/19/2021                             |      |      |      |           |      |      | East/West Street           | Independence School Road  |      |      |     |            |      |      |   |
| Analysis Year                                    | 2027                                  |      |      |      |           |      |      | North/South Street         | Cedar Creek Road          |      |      |     |            |      |      |   |
| Time Analyzed                                    | PM Peak No Build                      |      |      |      |           |      |      | Peak Hour Factor           | 0.74                      |      |      |     |            |      |      |   |
| Intersection Orientation                         | North-South                           |      |      |      |           |      |      | Analysis Time Period (hrs) | 0.25                      |      |      |     |            |      |      |   |
| Project Description                              | Oak Grove                             |      |      |      |           |      |      |                            |                           |      |      |     |            |      |      |   |
| <b>Lanes</b>                                     |                                       |      |      |      |           |      |      |                            |                           |      |      |     |            |      |      |   |
| <p>Major Street: North-South</p>                 |                                       |      |      |      |           |      |      |                            |                           |      |      |     |            |      |      |   |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |      |      |      |           |      |      |                            |                           |      |      |     |            |      |      |   |
| Approach                                         | Eastbound                             |      |      |      | Westbound |      |      |                            | Northbound                |      |      |     | Southbound |      |      |   |
| Movement                                         | U                                     | L    | T    | R    | U         | L    | T    | R                          | U                         | L    | T    | R   | U          | L    | T    | R |
| Priority                                         |                                       | 10   | 11   | 12   |           | 7    | 8    | 9                          | 10                        | 1    | 2    | 3   | 4          | 5    | 6    |   |
| Number of Lanes                                  |                                       | 0    | 1    | 0    |           | 0    | 1    | 0                          |                           | 0    | 1    | 0   |            | 0    | 1    | 0 |
| Configuration                                    |                                       |      | LTR  |      |           |      | LTR  |                            |                           |      | LTR  |     |            |      | LTR  |   |
| Volume (veh/h)                                   |                                       | 2    | 0    | 7    |           | 35   | 2    | 10                         |                           | 10   | 64   | 171 |            | 15   | 44   | 2 |
| Percent Heavy Vehicles (%)                       |                                       | 0    | 0    | 0    |           | 0    | 0    | 11                         |                           | 0    |      |     |            | 8    |      |   |
| Proportion Time Blocked                          |                                       |      |      |      |           |      |      |                            |                           |      |      |     |            |      |      |   |
| Percent Grade (%)                                | 0                                     |      |      |      | 0         |      |      |                            |                           |      |      |     |            |      |      |   |
| Right Turn Channelized                           |                                       |      |      |      |           |      |      |                            |                           |      |      |     |            |      |      |   |
| Median Type   Storage                            | Undivided                             |      |      |      |           |      |      |                            |                           |      |      |     |            |      |      |   |
| <b>Critical and Follow-up Headways</b>           |                                       |      |      |      |           |      |      |                            |                           |      |      |     |            |      |      |   |
| Base Critical Headway (sec)                      |                                       | 7.1  | 6.5  | 6.2  |           | 7.1  | 6.5  | 6.2                        |                           | 4.1  |      |     |            | 4.1  |      |   |
| Critical Headway (sec)                           |                                       | 7.10 | 6.50 | 6.20 |           | 7.10 | 6.50 | 6.31                       |                           | 4.10 |      |     |            | 4.18 |      |   |
| Base Follow-Up Headway (sec)                     |                                       | 3.5  | 4.0  | 3.3  |           | 3.5  | 4.0  | 3.3                        |                           | 2.2  |      |     |            | 2.2  |      |   |
| Follow-Up Headway (sec)                          |                                       | 3.50 | 4.00 | 3.30 |           | 3.50 | 4.00 | 3.40                       |                           | 2.20 |      |     |            | 2.27 |      |   |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |      |      |      |           |      |      |                            |                           |      |      |     |            |      |      |   |
| Flow Rate, v (veh/h)                             |                                       |      | 12   |      |           |      | 64   |                            |                           |      | 14   |     |            |      | 20   |   |
| Capacity, c (veh/h)                              |                                       |      | 874  |      |           |      | 637  |                            |                           |      | 1554 |     |            |      | 1209 |   |
| v/c Ratio                                        |                                       |      | 0.01 |      |           |      | 0.10 |                            |                           |      | 0.01 |     |            |      | 0.02 |   |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |      | 0.0  |      |           |      | 0.3  |                            |                           |      | 0.0  |     |            |      | 0.1  |   |
| Control Delay (s/veh)                            |                                       |      | 9.2  |      |           |      | 11.3 |                            |                           |      | 7.3  |     |            |      | 8.0  |   |
| Level of Service (LOS)                           |                                       |      | A    |      |           |      | B    |                            |                           |      | A    |     |            |      | A    |   |
| Approach Delay (s/veh)                           | 9.2                                   |      |      |      | 11.3      |      |      |                            | 0.4                       |      |      |     | 2.1        |      |      |   |
| Approach LOS                                     | A                                     |      |      |      | B         |      |      |                            |                           |      |      |     |            |      |      |   |

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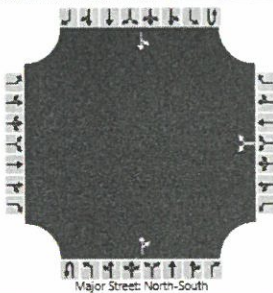
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Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Two-Way Stop-Control Report                 |                                       |      |      |      |           |      |      |                            |                           |      |      |     |            |      |      |   |
|--------------------------------------------------|---------------------------------------|------|------|------|-----------|------|------|----------------------------|---------------------------|------|------|-----|------------|------|------|---|
| General Information                              |                                       |      |      |      |           |      |      | Site Information           |                           |      |      |     |            |      |      |   |
| Analyst                                          | DBZ                                   |      |      |      |           |      |      | Intersection               | Cedar Creek at Ind School |      |      |     |            |      |      |   |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |      |      |      |           |      |      | Jurisdiction               |                           |      |      |     |            |      |      |   |
| Date Performed                                   | 5/9/2022                              |      |      |      |           |      |      | East/West Street           | Independence School Road  |      |      |     |            |      |      |   |
| Analysis Year                                    | 2027                                  |      |      |      |           |      |      | North/South Street         | Cedar Creek Road          |      |      |     |            |      |      |   |
| Time Analyzed                                    | PM Peak Build                         |      |      |      |           |      |      | Peak Hour Factor           | 0.74                      |      |      |     |            |      |      |   |
| Intersection Orientation                         | North-South                           |      |      |      |           |      |      | Analysis Time Period (hrs) | 0.25                      |      |      |     |            |      |      |   |
| Project Description                              | Oak Grove                             |      |      |      |           |      |      |                            |                           |      |      |     |            |      |      |   |
| <b>Lanes</b>                                     |                                       |      |      |      |           |      |      |                            |                           |      |      |     |            |      |      |   |
| <p>Major Street: North-South</p>                 |                                       |      |      |      |           |      |      |                            |                           |      |      |     |            |      |      |   |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |      |      |      |           |      |      |                            |                           |      |      |     |            |      |      |   |
| Approach                                         | Eastbound                             |      |      |      | Westbound |      |      |                            | Northbound                |      |      |     | Southbound |      |      |   |
| Movement                                         | U                                     | L    | T    | R    | U         | L    | T    | R                          | U                         | L    | T    | R   | U          | L    | T    | R |
| Priority                                         |                                       | 10   | 11   | 12   |           | 7    | 8    | 9                          | 1U                        | 1    | 2    | 3   | 4U         | 4    | 5    | 6 |
| Number of Lanes                                  |                                       | 0    | 1    | 0    |           | 0    | 1    | 0                          | 0                         | 0    | 1    | 0   | 0          | 0    | 1    | 0 |
| Configuration                                    |                                       |      | LTR  |      |           |      | LTR  |                            |                           |      | LTR  |     |            |      | LTR  |   |
| Volume (veh/h)                                   |                                       | 2    | 0    | 7    |           | 45   | 2    | 13                         |                           | 10   | 64   | 191 |            | 17   | 44   | 2 |
| Percent Heavy Vehicles (%)                       |                                       | 0    | 0    | 0    |           | 0    | 0    | 11                         |                           | 0    |      |     |            | 8    |      |   |
| Proportion Time Blocked                          |                                       |      |      |      |           |      |      |                            |                           |      |      |     |            |      |      |   |
| Percent Grade (%)                                | 0                                     |      |      |      | 0         |      |      |                            |                           |      |      |     |            |      |      |   |
| Right Turn Channelized                           |                                       |      |      |      |           |      |      |                            |                           |      |      |     |            |      |      |   |
| Median Type   Storage                            | Undivided                             |      |      |      |           |      |      |                            |                           |      |      |     |            |      |      |   |
| <b>Critical and Follow-up Headways</b>           |                                       |      |      |      |           |      |      |                            |                           |      |      |     |            |      |      |   |
| Base Critical Headway (sec)                      |                                       | 7.1  | 6.5  | 6.2  |           | 7.1  | 6.5  | 6.2                        |                           | 4.1  |      |     |            | 4.1  |      |   |
| Critical Headway (sec)                           |                                       | 7.10 | 6.50 | 6.20 |           | 7.10 | 6.50 | 6.31                       |                           | 4.10 |      |     |            | 4.18 |      |   |
| Base Follow-Up Headway (sec)                     |                                       | 3.5  | 4.0  | 3.3  |           | 3.5  | 4.0  | 3.3                        |                           | 2.2  |      |     |            | 2.2  |      |   |
| Follow-Up Headway (sec)                          |                                       | 3.50 | 4.00 | 3.30 |           | 3.50 | 4.00 | 3.40                       |                           | 2.20 |      |     |            | 2.27 |      |   |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |      |      |      |           |      |      |                            |                           |      |      |     |            |      |      |   |
| Flow Rate, v (veh/h)                             |                                       |      | 12   |      |           |      | 81   |                            |                           |      | 14   |     |            |      | 23   |   |
| Capacity, c (veh/h)                              |                                       |      | 862  |      |           |      | 620  |                            |                           |      | 1554 |     |            |      | 1182 |   |
| v/c Ratio                                        |                                       |      | 0.01 |      |           |      | 0.13 |                            |                           |      | 0.01 |     |            |      | 0.02 |   |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |      | 0.0  |      |           |      | 0.4  |                            |                           |      | 0.0  |     |            |      | 0.1  |   |
| Control Delay (s/veh)                            |                                       |      | 9.2  |      |           |      | 11.7 |                            |                           |      | 7.3  |     |            |      | 8.1  |   |
| Level of Service (LOS)                           |                                       |      | A    |      |           |      | B    |                            |                           |      | A    |     |            |      | A    |   |
| Approach Delay (s/veh)                           | 9.2                                   |      |      |      | 11.7      |      |      |                            | 0.4                       |      |      |     | 2.3        |      |      |   |
| Approach LOS                                     | A                                     |      |      |      | B         |      |      |                            |                           |      |      |     |            |      |      |   |



| HCS7 Two-Way Stop-Control Report                                                                                   |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
|--------------------------------------------------------------------------------------------------------------------|---------------------------------------|----|----|----|-----------|------|----|----------------------------|----------------------|---|----|----|------------|------|----|---|
| General Information                                                                                                |                                       |    |    |    |           |      |    | Site Information           |                      |   |    |    |            |      |    |   |
| Analyst                                                                                                            | DBZ                                   |    |    |    |           |      |    | Intersection               | Thixton at Oak Grove |   |    |    |            |      |    |   |
| Agency/Co.                                                                                                         | Diane B Zimmerman Traffic Engineering |    |    |    |           |      |    | Jurisdiction               |                      |   |    |    |            |      |    |   |
| Date Performed                                                                                                     | 9/19/2021                             |    |    |    |           |      |    | East/West Street           | Thixton              |   |    |    |            |      |    |   |
| Analysis Year                                                                                                      | 2021                                  |    |    |    |           |      |    | North/South Street         | Oak Grove/Thixton    |   |    |    |            |      |    |   |
| Time Analyzed                                                                                                      | AM Peak                               |    |    |    |           |      |    | Peak Hour Factor           | 0.94                 |   |    |    |            |      |    |   |
| Intersection Orientation                                                                                           | North-South                           |    |    |    |           |      |    | Analysis Time Period (hrs) | 0.25                 |   |    |    |            |      |    |   |
| Project Description                                                                                                | Oak Grove                             |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| <b>Lanes</b>                                                                                                       |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
|  <p>Major Street: North-South</p> |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| <b>Vehicle Volumes and Adjustments</b>                                                                             |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| Approach                                                                                                           | Eastbound                             |    |    |    | Westbound |      |    |                            | Northbound           |   |    |    | Southbound |      |    |   |
| Movement                                                                                                           | U                                     | L  | T  | R  | U         | L    | T  | R                          | U                    | L | T  | R  | U          | L    | T  | R |
| Priority                                                                                                           |                                       | 10 | 11 | 12 |           | 7    | 8  | 9                          | 1U                   | 1 | 2  | 3  | 4U         | 4    | 5  | 6 |
| Number of Lanes                                                                                                    |                                       | 0  | 0  | 0  |           | 0    | 1  | 0                          | 0                    | 0 | 1  | 0  | 0          | 0    | 1  | 0 |
| Configuration                                                                                                      |                                       |    |    |    |           |      | LR |                            |                      |   |    | TR |            | LT   |    |   |
| Volume (veh/h)                                                                                                     |                                       |    |    |    |           | 90   |    | 5                          |                      |   | 24 | 89 |            | 3    | 12 |   |
| Percent Heavy Vehicles (%)                                                                                         |                                       |    |    |    |           | 6    |    | 0                          |                      |   |    |    |            | 67   |    |   |
| Proportion Time Blocked                                                                                            |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| Percent Grade (%)                                                                                                  |                                       |    |    |    | 0         |      |    |                            |                      |   |    |    |            |      |    |   |
| Right Turn Channelized                                                                                             |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| Median Type   Storage                                                                                              | Undivided                             |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| <b>Critical and Follow-up Headways</b>                                                                             |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| Base Critical Headway (sec)                                                                                        |                                       |    |    |    |           | 7.1  |    | 6.2                        |                      |   |    |    |            | 4.1  |    |   |
| Critical Headway (sec)                                                                                             |                                       |    |    |    |           | 6.46 |    | 6.20                       |                      |   |    |    |            | 4.77 |    |   |
| Base Follow-Up Headway (sec)                                                                                       |                                       |    |    |    |           | 3.5  |    | 3.3                        |                      |   |    |    |            | 2.2  |    |   |
| Follow-Up Headway (sec)                                                                                            |                                       |    |    |    |           | 3.55 |    | 3.30                       |                      |   |    |    |            | 2.80 |    |   |
| <b>Delay, Queue Length, and Level of Service</b>                                                                   |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| Flow Rate, v (veh/h)                                                                                               |                                       |    |    |    |           | 101  |    |                            |                      |   |    |    |            | 3    |    |   |
| Capacity, c (veh/h)                                                                                                |                                       |    |    |    |           | 901  |    |                            |                      |   |    |    |            | 1147 |    |   |
| v/c Ratio                                                                                                          |                                       |    |    |    |           | 0.11 |    |                            |                      |   |    |    |            | 0.00 |    |   |
| 95% Queue Length, Q <sub>95</sub> (veh)                                                                            |                                       |    |    |    |           | 0.4  |    |                            |                      |   |    |    |            | 0.0  |    |   |
| Control Delay (s/veh)                                                                                              |                                       |    |    |    |           | 9.5  |    |                            |                      |   |    |    |            | 8.1  |    |   |
| Level of Service (LOS)                                                                                             |                                       |    |    |    |           | A    |    |                            |                      |   |    |    |            | A    |    |   |
| Approach Delay (s/veh)                                                                                             |                                       |    |    |    | 9.5       |      |    |                            |                      |   |    |    | 1.6        |      |    |   |
| Approach LOS                                                                                                       |                                       |    |    |    | A         |      |    |                            |                      |   |    |    |            |      |    |   |



Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Two-Way Stop-Control Report                 |                                       |    |    |    |           |      |      |                            |                      |   |    |     |            |      |    |   |
|--------------------------------------------------|---------------------------------------|----|----|----|-----------|------|------|----------------------------|----------------------|---|----|-----|------------|------|----|---|
| General Information                              |                                       |    |    |    |           |      |      | Site Information           |                      |   |    |     |            |      |    |   |
| Analyst                                          | DBZ                                   |    |    |    |           |      |      | Intersection               | Thixton at Oak Grove |   |    |     |            |      |    |   |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |    |    |    |           |      |      | Jurisdiction               |                      |   |    |     |            |      |    |   |
| Date Performed                                   | 9/19/2021                             |    |    |    |           |      |      | East/West Street           | Thixton              |   |    |     |            |      |    |   |
| Analysis Year                                    | 2027                                  |    |    |    |           |      |      | North/South Street         | Oak Grove/Thixton    |   |    |     |            |      |    |   |
| Time Analyzed                                    | AM Peak No Build                      |    |    |    |           |      |      | Peak Hour Factor           | 0.94                 |   |    |     |            |      |    |   |
| Intersection Orientation                         | North-South                           |    |    |    |           |      |      | Analysis Time Period (hrs) | 0.25                 |   |    |     |            |      |    |   |
| Project Description                              | Oak Grove                             |    |    |    |           |      |      |                            |                      |   |    |     |            |      |    |   |
| <b>Lanes</b>                                     |                                       |    |    |    |           |      |      |                            |                      |   |    |     |            |      |    |   |
|                                                  |                                       |    |    |    |           |      |      |                            |                      |   |    |     |            |      |    |   |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |    |    |    |           |      |      |                            |                      |   |    |     |            |      |    |   |
| Approach                                         | Eastbound                             |    |    |    | Westbound |      |      |                            | Northbound           |   |    |     | Southbound |      |    |   |
| Movement                                         | U                                     | L  | T  | R  | U         | L    | T    | R                          | U                    | L | T  | R   | U          | L    | T  | R |
| Priority                                         |                                       | 10 | 11 | 12 |           | 7    | 8    | 9                          | 1U                   | 1 | 2  | 3   | 4U         | 4    | 5  | 6 |
| Number of Lanes                                  |                                       | 0  | 0  | 0  |           | 0    | 1    | 0                          | 0                    | 0 | 1  | 0   | 0          | 0    | 1  | 0 |
| Configuration                                    |                                       |    |    |    |           |      | LR   |                            |                      |   |    | TR  |            | LT   |    |   |
| Volume (veh/h)                                   |                                       |    |    |    |           | 101  |      | 5                          |                      |   | 24 | 100 |            | 3    | 12 |   |
| Percent Heavy Vehicles (%)                       |                                       |    |    |    |           | 6    |      | 0                          |                      |   |    |     |            | 67   |    |   |
| Proportion Time Blocked                          |                                       |    |    |    |           |      |      |                            |                      |   |    |     |            |      |    |   |
| Percent Grade (%)                                |                                       |    |    |    | 0         |      |      |                            |                      |   |    |     |            |      |    |   |
| Right Turn Channelized                           |                                       |    |    |    |           |      |      |                            |                      |   |    |     |            |      |    |   |
| Median Type   Storage                            | Undivided                             |    |    |    |           |      |      |                            |                      |   |    |     |            |      |    |   |
| <b>Critical and Follow-up Headways</b>           |                                       |    |    |    |           |      |      |                            |                      |   |    |     |            |      |    |   |
| Base Critical Headway (sec)                      |                                       |    |    |    |           | 7.1  |      | 6.2                        |                      |   |    |     |            | 4.1  |    |   |
| Critical Headway (sec)                           |                                       |    |    |    |           | 6.46 |      | 6.20                       |                      |   |    |     |            | 4.77 |    |   |
| Base Follow-Up Headway (sec)                     |                                       |    |    |    |           | 3.5  |      | 3.3                        |                      |   |    |     |            | 2.2  |    |   |
| Follow-Up Headway (sec)                          |                                       |    |    |    |           | 3.55 |      | 3.30                       |                      |   |    |     |            | 2.80 |    |   |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |    |    |    |           |      |      |                            |                      |   |    |     |            |      |    |   |
| Flow Rate, v (veh/h)                             |                                       |    |    |    |           |      | 113  |                            |                      |   |    |     |            | 3    |    |   |
| Capacity, c (veh/h)                              |                                       |    |    |    |           |      | 893  |                            |                      |   |    |     |            | 1135 |    |   |
| v/c Ratio                                        |                                       |    |    |    |           |      | 0.13 |                            |                      |   |    |     |            | 0.00 |    |   |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |    |    |    |           |      | 0.4  |                            |                      |   |    |     |            | 0.0  |    |   |
| Control Delay (s/veh)                            |                                       |    |    |    |           |      | 9.6  |                            |                      |   |    |     |            | 8.2  |    |   |
| Level of Service (LOS)                           |                                       |    |    |    |           |      | A    |                            |                      |   |    |     |            | A    |    |   |
| Approach Delay (s/veh)                           |                                       |    |    |    | 9.6       |      |      |                            |                      |   |    |     | 1.7        |      |    |   |
| Approach LOS                                     |                                       |    |    |    | A         |      |      |                            |                      |   |    |     |            |      |    |   |

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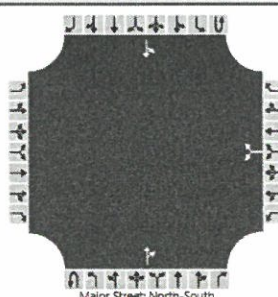


Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Two-Way Stop-Control Report                             |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
|--------------------------------------------------------------|---------------------------------------|----|----|----|-----------|------|----|----------------------------|----------------------|---|----|-----|------------|------|----|---|
| General Information                                          |                                       |    |    |    |           |      |    | Site Information           |                      |   |    |     |            |      |    |   |
| Analyst                                                      | DBZ                                   |    |    |    |           |      |    | Intersection               | Thixton at Oak Grove |   |    |     |            |      |    |   |
| Agency/Co.                                                   | Diane B Zimmerman Traffic Engineering |    |    |    |           |      |    | Jurisdiction               |                      |   |    |     |            |      |    |   |
| Date Performed                                               | 5/9/2022                              |    |    |    |           |      |    | East/West Street           | Thixton              |   |    |     |            |      |    |   |
| Analysis Year                                                | 2027                                  |    |    |    |           |      |    | North/South Street         | Oak Grove/Thixton    |   |    |     |            |      |    |   |
| Time Analyzed                                                | AM Peak Build                         |    |    |    |           |      |    | Peak Hour Factor           | 0.94                 |   |    |     |            |      |    |   |
| Intersection Orientation                                     | North-South                           |    |    |    |           |      |    | Analysis Time Period (hrs) | 0.25                 |   |    |     |            |      |    |   |
| Project Description                                          | Oak Grove                             |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| <b>Lanes</b>                                                 |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| <p style="text-align: center;">Major Street: North-South</p> |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| <b>Vehicle Volumes and Adjustments</b>                       |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| Approach                                                     | Eastbound                             |    |    |    | Westbound |      |    |                            | Northbound           |   |    |     | Southbound |      |    |   |
| Movement                                                     | U                                     | L  | T  | R  | U         | L    | T  | R                          | U                    | L | T  | R   | U          | L    | T  | R |
| Priority                                                     |                                       | 10 | 11 | 12 |           | 7    | 8  | 9                          | 1U                   | 1 | 2  | 3   | 4U         | 4    | 5  | 6 |
| Number of Lanes                                              |                                       | 0  | 0  | 0  |           | 0    | 1  | 0                          | 0                    | 0 | 1  | 0   | 0          | 0    | 1  | 0 |
| Configuration                                                |                                       |    |    |    |           |      | LR |                            |                      |   |    | TR  |            | LT   |    |   |
| Volume (veh/h)                                               |                                       |    |    |    |           | 109  |    | 13                         |                      |   | 30 | 123 |            | 27   | 30 |   |
| Percent Heavy Vehicles (%)                                   |                                       |    |    |    |           | 6    |    | 0                          |                      |   |    |     |            | 67   |    |   |
| Proportion Time Blocked                                      |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| Percent Grade (%)                                            |                                       |    |    |    | 0         |      |    |                            |                      |   |    |     |            |      |    |   |
| Right Turn Channelized                                       |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| Median Type   Storage                                        | Undivided                             |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| <b>Critical and Follow-up Headways</b>                       |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| Base Critical Headway (sec)                                  |                                       |    |    |    |           | 7.1  |    | 6.2                        |                      |   |    |     |            | 4.1  |    |   |
| Critical Headway (sec)                                       |                                       |    |    |    |           | 6.46 |    | 6.20                       |                      |   |    |     |            | 4.77 |    |   |
| Base Follow-Up Headway (sec)                                 |                                       |    |    |    |           | 3.5  |    | 3.3                        |                      |   |    |     |            | 2.2  |    |   |
| Follow-Up Headway (sec)                                      |                                       |    |    |    |           | 3.55 |    | 3.30                       |                      |   |    |     |            | 2.80 |    |   |
| <b>Delay, Queue Length, and Level of Service</b>             |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| Flow Rate, v (veh/h)                                         |                                       |    |    |    |           | 130  |    |                            |                      |   |    |     |            | 29   |    |   |
| Capacity, c (veh/h)                                          |                                       |    |    |    |           | 789  |    |                            |                      |   |    |     |            | 1102 |    |   |
| v/c Ratio                                                    |                                       |    |    |    |           | 0.16 |    |                            |                      |   |    |     |            | 0.03 |    |   |
| 95% Queue Length, Q <sub>95</sub> (veh)                      |                                       |    |    |    |           | 0.6  |    |                            |                      |   |    |     |            | 0.1  |    |   |
| Control Delay (s/veh)                                        |                                       |    |    |    |           | 10.5 |    |                            |                      |   |    |     |            | 8.4  |    |   |
| Level of Service (LOS)                                       |                                       |    |    |    |           | B    |    |                            |                      |   |    |     |            | A    |    |   |
| Approach Delay (s/veh)                                       |                                       |    |    |    | 10.5      |      |    |                            |                      |   |    |     | 4.1        |      |    |   |
| Approach LOS                                                 |                                       |    |    |    | B         |      |    |                            |                      |   |    |     |            |      |    |   |



Oak Grove Subdivision  
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| HCS7 Two-Way Stop-Control Report                                                  |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
|-----------------------------------------------------------------------------------|---------------------------------------|----|----|----|-----------|------|----|----------------------------|----------------------|---|---|-----|------------|------|----|---|
| General Information                                                               |                                       |    |    |    |           |      |    | Site Information           |                      |   |   |     |            |      |    |   |
| Analyst                                                                           | DBZ                                   |    |    |    |           |      |    | Intersection               | Thixton at Oak Grove |   |   |     |            |      |    |   |
| Agency/Co.                                                                        | Diane B Zimmerman Traffic Engineering |    |    |    |           |      |    | Jurisdiction               |                      |   |   |     |            |      |    |   |
| Date Performed                                                                    | 9/19/2021                             |    |    |    |           |      |    | East/West Street           | Thixton              |   |   |     |            |      |    |   |
| Analysis Year                                                                     | 2021                                  |    |    |    |           |      |    | North/South Street         | Oak Grove/Thixton    |   |   |     |            |      |    |   |
| Time Analyzed                                                                     | PM Peak                               |    |    |    |           |      |    | Peak Hour Factor           | 0.92                 |   |   |     |            |      |    |   |
| Intersection Orientation                                                          | North-South                           |    |    |    |           |      |    | Analysis Time Period (hrs) | 0.25                 |   |   |     |            |      |    |   |
| Project Description                                                               | Oak Grove                             |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| <b>Lanes</b>                                                                      |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
|  |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| <b>Vehicle Volumes and Adjustments</b>                                            |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Approach                                                                          | Eastbound                             |    |    |    | Westbound |      |    |                            | Northbound           |   |   |     | Southbound |      |    |   |
| Movement                                                                          | U                                     | L  | T  | R  | U         | L    | T  | R                          | U                    | L | T | R   | U          | L    | T  | R |
| Priority                                                                          |                                       | 10 | 11 | 12 |           | 7    | 8  | 9                          | 10                   | 1 | 2 | 3   | 4          | 5    | 6  |   |
| Number of Lanes                                                                   |                                       | 0  | 0  | 0  |           | 0    | 1  | 0                          |                      | 0 | 1 | 0   |            | 0    | 1  | 0 |
| Configuration                                                                     |                                       |    |    |    |           |      | LR |                            |                      |   |   | TR  |            |      | LT |   |
| Volume (veh/h)                                                                    |                                       |    |    |    |           | 129  |    | 7                          |                      |   | 9 | 157 |            | 6    | 19 |   |
| Percent Heavy Vehicles (%)                                                        |                                       |    |    |    |           | 3    |    | 0                          |                      |   |   |     |            | 17   |    |   |
| Proportion Time Blocked                                                           |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Percent Grade (%)                                                                 |                                       |    |    |    | 0         |      |    |                            |                      |   |   |     |            |      |    |   |
| Right Turn Channelized                                                            |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Median Type   Storage                                                             | Undivided                             |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| <b>Critical and Follow-up Headways</b>                                            |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Base Critical Headway (sec)                                                       |                                       |    |    |    |           | 7.1  |    | 6.2                        |                      |   |   |     |            | 4.1  |    |   |
| Critical Headway (sec)                                                            |                                       |    |    |    |           | 6.43 |    | 6.20                       |                      |   |   |     |            | 4.27 |    |   |
| Base Follow-Up Headway (sec)                                                      |                                       |    |    |    |           | 3.5  |    | 3.3                        |                      |   |   |     |            | 2.2  |    |   |
| Follow-Up Headway (sec)                                                           |                                       |    |    |    |           | 3.53 |    | 3.30                       |                      |   |   |     |            | 2.35 |    |   |
| <b>Delay, Queue Length, and Level of Service</b>                                  |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Flow Rate, v (veh/h)                                                              |                                       |    |    |    |           | 148  |    |                            |                      |   |   |     |            | 7    |    |   |
| Capacity, c (veh/h)                                                               |                                       |    |    |    |           | 864  |    |                            |                      |   |   |     |            | 1309 |    |   |
| v/c Ratio                                                                         |                                       |    |    |    |           | 0.17 |    |                            |                      |   |   |     |            | 0.00 |    |   |
| 95% Queue Length, Q <sub>95</sub> (veh)                                           |                                       |    |    |    |           | 0.6  |    |                            |                      |   |   |     |            | 0.0  |    |   |
| Control Delay (s/veh)                                                             |                                       |    |    |    |           | 10.0 |    |                            |                      |   |   |     |            | 7.8  |    |   |
| Level of Service (LOS)                                                            |                                       |    |    |    |           | B    |    |                            |                      |   |   |     |            | A    |    |   |
| Approach Delay (s/veh)                                                            |                                       |    |    |    | 10.0      |      |    |                            |                      |   |   |     | 1.9        |      |    |   |
| Approach LOS                                                                      |                                       |    |    |    | B         |      |    |                            |                      |   |   |     |            |      |    |   |

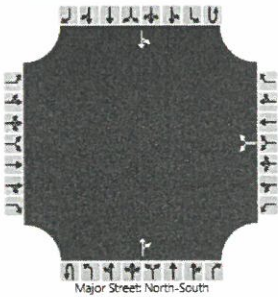


Oak Grove Subdivision  
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| HCS7 Two-Way Stop-Control Report                 |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
|--------------------------------------------------|---------------------------------------|----|----|----|-----------|------|----|----------------------------|----------------------|---|---|-----|------------|------|----|---|
| General Information                              |                                       |    |    |    |           |      |    | Site Information           |                      |   |   |     |            |      |    |   |
| Analyst                                          | DBZ                                   |    |    |    |           |      |    | Intersection               | Thixton at Oak Grove |   |   |     |            |      |    |   |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |    |    |    |           |      |    | Jurisdiction               |                      |   |   |     |            |      |    |   |
| Date Performed                                   | 9/19/2021                             |    |    |    |           |      |    | East/West Street           | Thixton              |   |   |     |            |      |    |   |
| Analysis Year                                    | 2027                                  |    |    |    |           |      |    | North/South Street         | Oak Grove/Thixton    |   |   |     |            |      |    |   |
| Time Analyzed                                    | PM Peak No Build                      |    |    |    |           |      |    | Peak Hour Factor           | 0.92                 |   |   |     |            |      |    |   |
| Intersection Orientation                         | North-South                           |    |    |    |           |      |    | Analysis Time Period (hrs) | 0.25                 |   |   |     |            |      |    |   |
| Project Description                              | Oak Grove                             |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| <b>Lanes</b>                                     |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| <p>Major Street: North-South</p>                 |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Approach                                         | Eastbound                             |    |    |    | Westbound |      |    |                            | Northbound           |   |   |     | Southbound |      |    |   |
| Movement                                         | U                                     | L  | T  | R  | U         | L    | T  | R                          | U                    | L | T | R   | U          | L    | T  | R |
| Priority                                         |                                       | 10 | 11 | 12 |           | 7    | 8  | 9                          | 1U                   | 1 | 2 | 3   | 4U         | 4    | 5  | 6 |
| Number of Lanes                                  |                                       | 0  | 0  | 0  |           | 0    | 1  | 0                          | 0                    | 0 | 1 | 0   | 0          | 0    | 1  | 0 |
| Configuration                                    |                                       |    |    |    |           |      | LR |                            |                      |   |   | TR  |            | LT   |    |   |
| Volume (veh/h)                                   |                                       |    |    |    |           | 145  |    | 7                          |                      |   | 9 | 177 |            | 6    | 19 |   |
| Percent Heavy Vehicles (%)                       |                                       |    |    |    |           | 3    |    | 0                          |                      |   |   |     |            | 17   |    |   |
| Proportion Time Blocked                          |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Percent Grade (%)                                |                                       |    |    |    | 0         |      |    |                            |                      |   |   |     |            |      |    |   |
| Right Turn Channelized                           |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Median Type   Storage                            | Undivided                             |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| <b>Critical and Follow-up Headways</b>           |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Base Critical Headway (sec)                      |                                       |    |    |    |           | 7.1  |    | 6.2                        |                      |   |   |     |            | 4.1  |    |   |
| Critical Headway (sec)                           |                                       |    |    |    |           | 6.43 |    | 6.20                       |                      |   |   |     |            | 4.27 |    |   |
| Base Follow-Up Headway (sec)                     |                                       |    |    |    |           | 3.5  |    | 3.3                        |                      |   |   |     |            | 2.2  |    |   |
| Follow-Up Headway (sec)                          |                                       |    |    |    |           | 3.53 |    | 3.30                       |                      |   |   |     |            | 2.35 |    |   |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Flow Rate, v (veh/h)                             |                                       |    |    |    |           | 165  |    |                            |                      |   |   |     |            | 7    |    |   |
| Capacity, c (veh/h)                              |                                       |    |    |    |           | 851  |    |                            |                      |   |   |     |            | 1285 |    |   |
| v/c Ratio                                        |                                       |    |    |    |           | 0.19 |    |                            |                      |   |   |     |            | 0.01 |    |   |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |    |    |    |           | 0.7  |    |                            |                      |   |   |     |            | 0.0  |    |   |
| Control Delay (s/veh)                            |                                       |    |    |    |           | 10.2 |    |                            |                      |   |   |     |            | 7.8  |    |   |
| Level of Service (LOS)                           |                                       |    |    |    |           | B    |    |                            |                      |   |   |     |            | A    |    |   |
| Approach Delay (s/veh)                           |                                       |    |    |    | 10.2      |      |    |                            |                      |   |   |     | 1.9        |      |    |   |
| Approach LOS                                     |                                       |    |    |    | B         |      |    |                            |                      |   |   |     |            |      |    |   |



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| HCS7 Two-Way Stop-Control Report                                                                                   |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
|--------------------------------------------------------------------------------------------------------------------|---------------------------------------|----|----|----|-----------|------|----|----------------------------|----------------------|---|----|-----|------------|------|----|---|
| General Information                                                                                                |                                       |    |    |    |           |      |    | Site Information           |                      |   |    |     |            |      |    |   |
| Analyst                                                                                                            | DBZ                                   |    |    |    |           |      |    | Intersection               | Thixton at Oak Grove |   |    |     |            |      |    |   |
| Agency/Co.                                                                                                         | Diane B Zimmerman Traffic Engineering |    |    |    |           |      |    | Jurisdiction               |                      |   |    |     |            |      |    |   |
| Date Performed                                                                                                     | 5/9/2022                              |    |    |    |           |      |    | East/West Street           | Thixton              |   |    |     |            |      |    |   |
| Analysis Year                                                                                                      | 2027                                  |    |    |    |           |      |    | North/South Street         | Oak Grove/Thixton    |   |    |     |            |      |    |   |
| Time Analyzed                                                                                                      | PM Peak Build                         |    |    |    |           |      |    | Peak Hour Factor           | 0.92                 |   |    |     |            |      |    |   |
| Intersection Orientation                                                                                           | North-South                           |    |    |    |           |      |    | Analysis Time Period (hrs) | 0.25                 |   |    |     |            |      |    |   |
| Project Description                                                                                                | Oak Grove                             |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| <b>Lanes</b>                                                                                                       |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
|  <p>Major Street: North-South</p> |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| <b>Vehicle Volumes and Adjustments</b>                                                                             |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| Approach                                                                                                           | Eastbound                             |    |    |    | Westbound |      |    |                            | Northbound           |   |    |     | Southbound |      |    |   |
| Movement                                                                                                           | U                                     | L  | T  | R  | U         | L    | T  | R                          | U                    | L | T  | R   | U          | L    | T  | R |
| Priority                                                                                                           |                                       | 10 | 11 | 12 |           | 7    | 8  | 9                          | 1U                   | 1 | 2  | 3   | 4U         | 4    | 5  | 6 |
| Number of Lanes                                                                                                    |                                       | 0  | 0  | 0  |           | 0    | 1  | 0                          | 0                    | 0 | 1  | 0   | 0          | 0    | 1  | 0 |
| Configuration                                                                                                      |                                       |    |    |    |           |      | LR |                            |                      |   |    | TR  |            | LT   |    |   |
| Volume (veh/h)                                                                                                     |                                       |    |    |    |           | 171  |    | 36                         |                      |   | 30 | 192 |            | 36   | 31 |   |
| Percent Heavy Vehicles (%)                                                                                         |                                       |    |    |    |           | 3    |    | 0                          |                      |   |    |     |            | 2    |    |   |
| Proportion Time Blocked                                                                                            |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| Percent Grade (%)                                                                                                  |                                       |    |    |    | 0         |      |    |                            |                      |   |    |     |            |      |    |   |
| Right Turn Channelized                                                                                             |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| Median Type   Storage                                                                                              | Undivided                             |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| <b>Critical and Follow-up Headways</b>                                                                             |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| Base Critical Headway (sec)                                                                                        |                                       |    |    |    |           | 7.1  |    | 6.2                        |                      |   |    |     |            | 4.1  |    |   |
| Critical Headway (sec)                                                                                             |                                       |    |    |    |           | 6.43 |    | 6.20                       |                      |   |    |     |            | 4.12 |    |   |
| Base Follow-Up Headway (sec)                                                                                       |                                       |    |    |    |           | 3.5  |    | 3.3                        |                      |   |    |     |            | 2.2  |    |   |
| Follow-Up Headway (sec)                                                                                            |                                       |    |    |    |           | 3.53 |    | 3.30                       |                      |   |    |     |            | 2.22 |    |   |
| <b>Delay, Queue Length, and Level of Service</b>                                                                   |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| Flow Rate, v (veh/h)                                                                                               |                                       |    |    |    |           | 225  |    |                            |                      |   |    |     |            | 39   |    |   |
| Capacity, c (veh/h)                                                                                                |                                       |    |    |    |           | 744  |    |                            |                      |   |    |     |            | 1325 |    |   |
| v/c Ratio                                                                                                          |                                       |    |    |    |           | 0.30 |    |                            |                      |   |    |     |            | 0.03 |    |   |
| 95% Queue Length, Q <sub>95</sub> (veh)                                                                            |                                       |    |    |    |           | 1.3  |    |                            |                      |   |    |     |            | 0.1  |    |   |
| Control Delay (s/veh)                                                                                              |                                       |    |    |    |           | 11.9 |    |                            |                      |   |    |     |            | 7.8  |    |   |
| Level of Service (LOS)                                                                                             |                                       |    |    |    |           | B    |    |                            |                      |   |    |     |            | A    |    |   |
| Approach Delay (s/veh)                                                                                             |                                       |    |    |    | 11.9      |      |    |                            |                      |   |    |     | 4.3        |      |    |   |
| Approach LOS                                                                                                       |                                       |    |    |    | B         |      |    |                            |                      |   |    |     |            |      |    |   |



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| HCS7 Two-Way Stop-Control Report                 |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
|--------------------------------------------------|---------------------------------------|----|----|----|-----------|------|----|----------------------------|-----------------------|---|----|----|------------|------|---|---|
| General Information                              |                                       |    |    |    |           |      |    | Site Information           |                       |   |    |    |            |      |   |   |
| Analyst                                          | DBZ                                   |    |    |    |           |      |    | Intersection               | Oak Grove at Entrance |   |    |    |            |      |   |   |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |    |    |    |           |      |    | Jurisdiction               |                       |   |    |    |            |      |   |   |
| Date Performed                                   | 5/9/2022                              |    |    |    |           |      |    | East/West Street           | Oak Grove             |   |    |    |            |      |   |   |
| Analysis Year                                    | 2027                                  |    |    |    |           |      |    | North/South Street         | Oak Grove/Entrance    |   |    |    |            |      |   |   |
| Time Analyzed                                    | AM Peak Build                         |    |    |    |           |      |    | Peak Hour Factor           | 0.94                  |   |    |    |            |      |   |   |
| Intersection Orientation                         | North-South                           |    |    |    |           |      |    | Analysis Time Period (hrs) | 0.25                  |   |    |    |            |      |   |   |
| Project Description                              | Oak Grove                             |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
| <b>Lanes</b>                                     |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
| <p>Major Street: North-South</p>                 |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
| Approach                                         | Eastbound                             |    |    |    | Westbound |      |    |                            | Northbound            |   |    |    | Southbound |      |   |   |
| Movement                                         | U                                     | L  | T  | R  | U         | L    | T  | R                          | U                     | L | T  | R  | U          | L    | T | R |
| Priority                                         |                                       | 10 | 11 | 12 |           | 7    | 8  | 9                          | 1U                    | 1 | 2  | 3  | 4U         | 4    | 5 | 6 |
| Number of Lanes                                  |                                       | 0  | 0  | 0  |           | 0    | 1  | 0                          | 0                     | 0 | 1  | 0  | 0          | 0    | 1 | 0 |
| Configuration                                    |                                       |    |    |    |           |      | LR |                            |                       |   |    | TR |            | LT   |   |   |
| Volume (veh/h)                                   |                                       |    |    |    |           | 14   |    | 29                         |                       |   | 19 | 42 |            | 15   | 7 |   |
| Percent Heavy Vehicles (%)                       |                                       |    |    |    |           | 0    |    | 3                          |                       |   |    |    |            | 7    |   |   |
| Proportion Time Blocked                          |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
| Percent Grade (%)                                |                                       |    |    |    | 0         |      |    |                            |                       |   |    |    |            |      |   |   |
| Right Turn Channelized                           |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
| Median Type   Storage                            | Undivided                             |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
| <b>Critical and Follow-up Headways</b>           |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
| Base Critical Headway (sec)                      |                                       |    |    |    |           | 7.1  |    | 6.2                        |                       |   |    |    |            | 4.1  |   |   |
| Critical Headway (sec)                           |                                       |    |    |    |           | 6.40 |    | 6.23                       |                       |   |    |    |            | 4.17 |   |   |
| Base Follow-Up Headway (sec)                     |                                       |    |    |    |           | 3.5  |    | 3.3                        |                       |   |    |    |            | 2.2  |   |   |
| Follow-Up Headway (sec)                          |                                       |    |    |    |           | 3.50 |    | 3.33                       |                       |   |    |    |            | 2.26 |   |   |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
| Flow Rate, v (veh/h)                             |                                       |    |    |    |           | 46   |    |                            |                       |   |    |    |            | 16   |   |   |
| Capacity, c (veh/h)                              |                                       |    |    |    |           | 987  |    |                            |                       |   |    |    |            | 1506 |   |   |
| v/c Ratio                                        |                                       |    |    |    |           | 0.05 |    |                            |                       |   |    |    |            | 0.01 |   |   |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |    |    |    |           | 0.1  |    |                            |                       |   |    |    |            | 0.0  |   |   |
| Control Delay (s/veh)                            |                                       |    |    |    |           | 8.8  |    |                            |                       |   |    |    |            | 7.4  |   |   |
| Level of Service (LOS)                           |                                       |    |    |    |           | A    |    |                            |                       |   |    |    |            | A    |   |   |
| Approach Delay (s/veh)                           |                                       |    |    |    | 8.8       |      |    |                            |                       |   |    |    | 5.1        |      |   |   |
| Approach LOS                                     |                                       |    |    |    | A         |      |    |                            |                       |   |    |    |            |      |   |   |

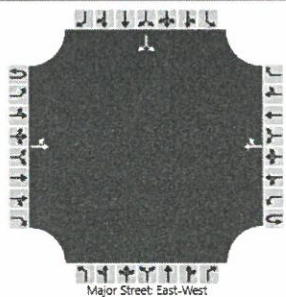


Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Two-Way Stop-Control Report                 |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |    |   |
|--------------------------------------------------|---------------------------------------|----|----|----|-----------|------|----|----------------------------|-----------------------|---|----|----|------------|------|----|---|
| General Information                              |                                       |    |    |    |           |      |    | Site Information           |                       |   |    |    |            |      |    |   |
| Analyst                                          | DBZ                                   |    |    |    |           |      |    | Intersection               | Oak Grove at Entrance |   |    |    |            |      |    |   |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |    |    |    |           |      |    | Jurisdiction               |                       |   |    |    |            |      |    |   |
| Date Performed                                   | 5/9/2022                              |    |    |    |           |      |    | East/West Street           | Oak Grove             |   |    |    |            |      |    |   |
| Analysis Year                                    | 2027                                  |    |    |    |           |      |    | North/South Street         | Oak Grove/Entrance    |   |    |    |            |      |    |   |
| Time Analyzed                                    | PM Peak Build                         |    |    |    |           |      |    | Peak Hour Factor           | 0.92                  |   |    |    |            |      |    |   |
| Intersection Orientation                         | North-South                           |    |    |    |           |      |    | Analysis Time Period (hrs) | 0.25                  |   |    |    |            |      |    |   |
| Project Description                              | Oak Grove                             |    |    |    |           |      |    |                            |                       |   |    |    |            |      |    |   |
| <b>Lanes</b>                                     |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |    |   |
|                                                  |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |    |   |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |    |   |
| Approach                                         | Eastbound                             |    |    |    | Westbound |      |    |                            | Northbound            |   |    |    | Southbound |      |    |   |
| Movement                                         | U                                     | L  | T  | R  | U         | L    | T  | R                          | U                     | L | T  | R  | U          | L    | T  | R |
| Priority                                         |                                       | 10 | 11 | 12 |           | 7    | 8  | 9                          | 10                    | 1 | 2  | 3  | 4          | 5    | 6  |   |
| Number of Lanes                                  |                                       | 0  | 0  | 0  |           | 0    | 1  | 0                          | 0                     | 0 | 1  | 0  | 0          | 0    | 1  | 0 |
| Configuration                                    |                                       |    |    |    |           |      | LR |                            |                       |   |    | TR |            | LT   |    |   |
| Volume (veh/h)                                   |                                       |    |    |    |           | 50   |    | 16                         |                       |   | 13 | 29 |            | 25   | 22 |   |
| Percent Heavy Vehicles (%)                       |                                       |    |    |    |           | 0    |    | 0                          |                       |   |    |    |            | 4    |    |   |
| Proportion Time Blocked                          |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |    |   |
| Percent Grade (%)                                |                                       |    |    |    |           | 0    |    |                            |                       |   |    |    |            |      |    |   |
| Right Turn Channelized                           |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |    |   |
| Median Type   Storage                            | Undivided                             |    |    |    |           |      |    |                            |                       |   |    |    |            |      |    |   |
| <b>Critical and Follow-up Headways</b>           |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |    |   |
| Base Critical Headway (sec)                      |                                       |    |    |    |           | 7.1  |    | 6.2                        |                       |   |    |    |            | 4.1  |    |   |
| Critical Headway (sec)                           |                                       |    |    |    |           | 6.40 |    | 6.20                       |                       |   |    |    |            | 4.14 |    |   |
| Base Follow-Up Headway (sec)                     |                                       |    |    |    |           | 3.5  |    | 3.3                        |                       |   |    |    |            | 2.2  |    |   |
| Follow-Up Headway (sec)                          |                                       |    |    |    |           | 3.50 |    | 3.30                       |                       |   |    |    |            | 2.24 |    |   |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |    |   |
| Flow Rate, v (veh/h)                             |                                       |    |    |    |           | 72   |    |                            |                       |   |    |    |            | 27   |    |   |
| Capacity, c (veh/h)                              |                                       |    |    |    |           | 915  |    |                            |                       |   |    |    |            | 1549 |    |   |
| v/c Ratio                                        |                                       |    |    |    |           | 0.08 |    |                            |                       |   |    |    |            | 0.02 |    |   |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |    |    |    |           | 0.3  |    |                            |                       |   |    |    |            | 0.1  |    |   |
| Control Delay (s/veh)                            |                                       |    |    |    |           | 9.3  |    |                            |                       |   |    |    |            | 7.4  |    |   |
| Level of Service (LOS)                           |                                       |    |    |    |           | A    |    |                            |                       |   |    |    |            | A    |    |   |
| Approach Delay (s/veh)                           |                                       |    |    |    | 9.3       |      |    |                            |                       |   |    |    | 4.0        |      |    |   |
| Approach LOS                                     |                                       |    |    |    | A         |      |    |                            |                       |   |    |    |            |      |    |   |



Oak Grove Subdivision  
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| HCS7 Two-Way Stop-Control Report                                                  |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |      |      |
|-----------------------------------------------------------------------------------|---------------------------------------|------|----|---|-----------|---|----|----------------------------|-------------------------|---|---|---|------------|------|------|------|
| General Information                                                               |                                       |      |    |   |           |   |    | Site Information           |                         |   |   |   |            |      |      |      |
| Analyst                                                                           | DBZ                                   |      |    |   |           |   |    | Intersection               | Thixton at Pebble Trace |   |   |   |            |      |      |      |
| Agency/Co.                                                                        | Diane B Zimmerman Traffic Engineering |      |    |   |           |   |    | Jurisdiction               |                         |   |   |   |            |      |      |      |
| Date Performed                                                                    | 9/19/2021                             |      |    |   |           |   |    | East/West Street           | Thixton Lane            |   |   |   |            |      |      |      |
| Analysis Year                                                                     | 2021                                  |      |    |   |           |   |    | North/South Street         | Pebble Trace            |   |   |   |            |      |      |      |
| Time Analyzed                                                                     | AM Peak                               |      |    |   |           |   |    | Peak Hour Factor           | 0.90                    |   |   |   |            |      |      |      |
| Intersection Orientation                                                          | East-West                             |      |    |   |           |   |    | Analysis Time Period (hrs) | 0.25                    |   |   |   |            |      |      |      |
| Project Description                                                               | Oak Grove                             |      |    |   |           |   |    |                            |                         |   |   |   |            |      |      |      |
| <b>Lanes</b>                                                                      |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |      |      |
|  |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |      |      |
| <b>Vehicle Volumes and Adjustments</b>                                            |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |      |      |
| Approach                                                                          | Eastbound                             |      |    |   | Westbound |   |    |                            | Northbound              |   |   |   | Southbound |      |      |      |
| Movement                                                                          | U                                     | L    | T  | R | U         | L | T  | R                          | U                       | L | T | R | U          | L    | T    | R    |
| Priority                                                                          | 1U                                    | 1    | 2  | 3 | 4U        | 4 | 5  | 6                          |                         | 7 | 8 | 9 |            | 10   | 11   | 12   |
| Number of Lanes                                                                   | 0                                     | 0    | 1  | 0 | 0         | 0 | 1  | 0                          |                         | 0 | 0 | 0 |            | 0    | 1    | 0    |
| Configuration                                                                     |                                       | LT   |    |   |           |   |    | TR                         |                         |   |   |   |            |      | LR   |      |
| Volume (veh/h)                                                                    |                                       | 10   | 74 |   |           |   | 88 | 15                         |                         |   |   |   |            | 35   |      | 26   |
| Percent Heavy Vehicles (%)                                                        |                                       | 0    |    |   |           |   |    |                            |                         |   |   |   |            | 0    |      | 4    |
| Proportion Time Blocked                                                           |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |      |      |
| Percent Grade (%)                                                                 | 0                                     |      |    |   |           |   |    |                            |                         |   |   |   |            |      |      |      |
| Right Turn Channelized                                                            |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |      |      |
| Median Type   Storage                                                             | Undivided                             |      |    |   |           |   |    |                            |                         |   |   |   |            |      |      |      |
| <b>Critical and Follow-up Headways</b>                                            |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |      |      |
| Base Critical Headway (sec)                                                       |                                       | 4.1  |    |   |           |   |    |                            |                         |   |   |   |            | 7.1  |      | 6.2  |
| Critical Headway (sec)                                                            |                                       | 4.10 |    |   |           |   |    |                            |                         |   |   |   |            | 6.40 |      | 6.24 |
| Base Follow-Up Headway (sec)                                                      |                                       | 2.2  |    |   |           |   |    |                            |                         |   |   |   |            | 3.5  |      | 3.3  |
| Follow-Up Headway (sec)                                                           |                                       | 2.20 |    |   |           |   |    |                            |                         |   |   |   |            | 3.50 |      | 3.34 |
| <b>Delay, Queue Length, and Level of Service</b>                                  |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |      |      |
| Flow Rate, v (veh/h)                                                              |                                       | 11   |    |   |           |   |    |                            |                         |   |   |   |            |      | 68   |      |
| Capacity, c (veh/h)                                                               |                                       | 1487 |    |   |           |   |    |                            |                         |   |   |   |            |      | 839  |      |
| v/c Ratio                                                                         |                                       | 0.01 |    |   |           |   |    |                            |                         |   |   |   |            |      | 0.08 |      |
| 95% Queue Length, Q <sub>95</sub> (veh)                                           |                                       | 0.0  |    |   |           |   |    |                            |                         |   |   |   |            |      | 0.3  |      |
| Control Delay (s/veh)                                                             |                                       | 7.4  |    |   |           |   |    |                            |                         |   |   |   |            |      | 9.7  |      |
| Level of Service (LOS)                                                            |                                       | A    |    |   |           |   |    |                            |                         |   |   |   |            |      | A    |      |
| Approach Delay (s/veh)                                                            | 0.9                                   |      |    |   |           |   |    |                            |                         |   |   |   | 9.7        |      |      |      |
| Approach LOS                                                                      | A                                     |      |    |   |           |   |    |                            |                         |   |   |   | A          |      |      |      |



| HCS7 Two-Way Stop-Control Report                           |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |
|------------------------------------------------------------|---------------------------------------|------|----|---|-----------|---|----|----------------------------|-------------------------|---|---|---|------------|------|----|------|
| General Information                                        |                                       |      |    |   |           |   |    | Site Information           |                         |   |   |   |            |      |    |      |
| Analyst                                                    | DBZ                                   |      |    |   |           |   |    | Intersection               | Thixton at Pebble Trace |   |   |   |            |      |    |      |
| Agency/Co.                                                 | Diane B Zimmerman Traffic Engineering |      |    |   |           |   |    | Jurisdiction               |                         |   |   |   |            |      |    |      |
| Date Performed                                             | 9/19/2021                             |      |    |   |           |   |    | East/West Street           | Thixton Lane            |   |   |   |            |      |    |      |
| Analysis Year                                              | 2027                                  |      |    |   |           |   |    | North/South Street         | Pebble Trace            |   |   |   |            |      |    |      |
| Time Analyzed                                              | AM Peak No Build                      |      |    |   |           |   |    | Peak Hour Factor           | 0.90                    |   |   |   |            |      |    |      |
| Intersection Orientation                                   | East-West                             |      |    |   |           |   |    | Analysis Time Period (hrs) | 0.25                    |   |   |   |            |      |    |      |
| Project Description                                        | Oak Grove                             |      |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |
| <b>Lanes</b>                                               |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |
| <p style="text-align: center;">Major Street: East-West</p> |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |
| <b>Vehicle Volumes and Adjustments</b>                     |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |
| Approach                                                   | Eastbound                             |      |    |   | Westbound |   |    |                            | Northbound              |   |   |   | Southbound |      |    |      |
| Movement                                                   | U                                     | L    | T  | R | U         | L | T  | R                          | U                       | L | T | R | U          | L    | T  | R    |
| Priority                                                   | 1U                                    | 1    | 2  | 3 | 4U        | 4 | 5  | 6                          |                         | 7 | 8 | 9 |            | 10   | 11 | 12   |
| Number of Lanes                                            | 0                                     | 0    | 1  | 0 | 0         | 0 | 1  | 0                          |                         | 0 | 0 | 0 |            | 0    | 1  | 0    |
| Configuration                                              |                                       | LT   |    |   |           |   |    | TR                         |                         |   |   |   |            |      | LR |      |
| Volume (veh/h)                                             |                                       | 10   | 83 |   |           |   | 99 | 15                         |                         |   |   |   |            | 35   |    | 26   |
| Percent Heavy Vehicles (%)                                 |                                       | 0    |    |   |           |   |    |                            |                         |   |   |   |            | 0    |    | 4    |
| Proportion Time Blocked                                    |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |
| Percent Grade (%)                                          |                                       |      |    |   |           |   |    |                            |                         |   |   |   | 0          |      |    |      |
| Right Turn Channelized                                     |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |
| Median Type   Storage                                      | Undivided                             |      |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |
| <b>Critical and Follow-up Headways</b>                     |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |
| Base Critical Headway (sec)                                |                                       | 4.1  |    |   |           |   |    |                            |                         |   |   |   |            | 7.1  |    | 6.2  |
| Critical Headway (sec)                                     |                                       | 4.10 |    |   |           |   |    |                            |                         |   |   |   |            | 6.40 |    | 6.24 |
| Base Follow-Up Headway (sec)                               |                                       | 2.2  |    |   |           |   |    |                            |                         |   |   |   |            | 3.5  |    | 3.3  |
| Follow-Up Headway (sec)                                    |                                       | 2.20 |    |   |           |   |    |                            |                         |   |   |   |            | 3.50 |    | 3.34 |
| <b>Delay, Queue Length, and Level of Service</b>           |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |
| Flow Rate, v (veh/h)                                       |                                       | 11   |    |   |           |   |    |                            |                         |   |   |   |            | 68   |    |      |
| Capacity, c (veh/h)                                        |                                       | 1472 |    |   |           |   |    |                            |                         |   |   |   |            | 819  |    |      |
| v/c Ratio                                                  |                                       | 0.01 |    |   |           |   |    |                            |                         |   |   |   |            | 0.08 |    |      |
| 95% Queue Length, Q <sub>95</sub> (veh)                    |                                       | 0.0  |    |   |           |   |    |                            |                         |   |   |   |            | 0.3  |    |      |
| Control Delay (s/veh)                                      |                                       | 7.5  |    |   |           |   |    |                            |                         |   |   |   |            | 9.8  |    |      |
| Level of Service (LOS)                                     |                                       | A    |    |   |           |   |    |                            |                         |   |   |   |            | A    |    |      |
| Approach Delay (s/veh)                                     | 0.9                                   |      |    |   |           |   |    |                            |                         |   |   |   | 9.8        |      |    |      |
| Approach LOS                                               |                                       |      |    |   |           |   |    |                            |                         |   |   |   | A          |      |    |      |



Oak Grove Subdivision  
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| HCS7 Two-Way Stop-Control Report                 |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
|--------------------------------------------------|---------------------------------------|------|----|---|-----------|---|-----|----------------------------|-------------------------|---|---|---|------------|------|------|------|
| General Information                              |                                       |      |    |   |           |   |     | Site Information           |                         |   |   |   |            |      |      |      |
| Analyst                                          | DBZ                                   |      |    |   |           |   |     | Intersection               | Thixton at Pebble Trace |   |   |   |            |      |      |      |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |      |    |   |           |   |     | Jurisdiction               |                         |   |   |   |            |      |      |      |
| Date Performed                                   | 5/9/2022                              |      |    |   |           |   |     | East/West Street           | Thixton Lane            |   |   |   |            |      |      |      |
| Analysis Year                                    | 2027                                  |      |    |   |           |   |     | North/South Street         | Pebble Trace            |   |   |   |            |      |      |      |
| Time Analyzed                                    | AM Peak Build                         |      |    |   |           |   |     | Peak Hour Factor           | 0.90                    |   |   |   |            |      |      |      |
| Intersection Orientation                         | East-West                             |      |    |   |           |   |     | Analysis Time Period (hrs) | 0.25                    |   |   |   |            |      |      |      |
| Project Description                              | Oak Grove                             |      |    |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| <b>Lanes</b>                                     |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
|                                                  |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| Approach                                         | Eastbound                             |      |    |   | Westbound |   |     |                            | Northbound              |   |   |   | Southbound |      |      |      |
| Movement                                         | U                                     | L    | T  | R | U         | L | T   | R                          | U                       | L | T | R | U          | L    | T    | R    |
| Priority                                         | 1U                                    | 1    | 2  | 3 | 4U        | 4 | 5   | 6                          |                         | 7 | 8 | 9 |            | 10   | 11   | 12   |
| Number of Lanes                                  | 0                                     | 0    | 1  | 0 | 0         | 0 | 1   | 0                          |                         | 0 | 0 | 0 |            | 0    | 1    | 0    |
| Configuration                                    |                                       | LT   |    |   |           |   |     | TR                         |                         |   |   |   |            |      | LR   |      |
| Volume (veh/h)                                   |                                       | 14   | 89 |   |           |   | 117 | 23                         |                         |   |   |   |            | 58   |      | 36   |
| Percent Heavy Vehicles (%)                       |                                       | 0    |    |   |           |   |     |                            |                         |   |   |   |            | 0    |      | 4    |
| Proportion Time Blocked                          |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| Percent Grade (%)                                |                                       |      |    |   |           |   |     |                            |                         |   |   |   | 0          |      |      |      |
| Right Turn Channelized                           |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| Median Type   Storage                            | Undivided                             |      |    |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| <b>Critical and Follow-up Headways</b>           |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| Base Critical Headway (sec)                      |                                       | 4.1  |    |   |           |   |     |                            |                         |   |   |   |            | 7.1  |      | 6.2  |
| Critical Headway (sec)                           |                                       | 4.10 |    |   |           |   |     |                            |                         |   |   |   |            | 6.40 |      | 6.24 |
| Base Follow-Up Headway (sec)                     |                                       | 2.2  |    |   |           |   |     |                            |                         |   |   |   |            | 3.5  |      | 3.3  |
| Follow-Up Headway (sec)                          |                                       | 2.20 |    |   |           |   |     |                            |                         |   |   |   |            | 3.50 |      | 3.34 |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| Flow Rate, v (veh/h)                             |                                       | 16   |    |   |           |   |     |                            |                         |   |   |   |            |      | 104  |      |
| Capacity, c (veh/h)                              |                                       | 1437 |    |   |           |   |     |                            |                         |   |   |   |            |      | 774  |      |
| v/c Ratio                                        |                                       | 0.01 |    |   |           |   |     |                            |                         |   |   |   |            |      | 0.13 |      |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       | 0.0  |    |   |           |   |     |                            |                         |   |   |   |            |      | 0.5  |      |
| Control Delay (s/veh)                            |                                       | 7.5  |    |   |           |   |     |                            |                         |   |   |   |            |      | 10.4 |      |
| Level of Service (LOS)                           |                                       | A    |    |   |           |   |     |                            |                         |   |   |   |            |      | B    |      |
| Approach Delay (s/veh)                           | 1.1                                   |      |    |   |           |   |     |                            |                         |   |   |   | 10.4       |      |      |      |
| Approach LOS                                     |                                       |      |    |   |           |   |     |                            |                         |   |   |   | B          |      |      |      |

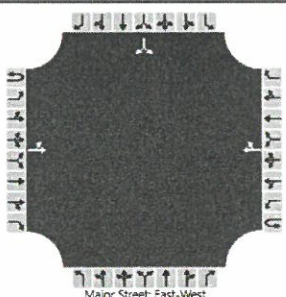


Oak Grove Subdivision  
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| HCS7 Two-Way Stop-Control Report                 |                                       |      |     |   |           |   |     |                            |            |   |   |                         |            |      |      |      |
|--------------------------------------------------|---------------------------------------|------|-----|---|-----------|---|-----|----------------------------|------------|---|---|-------------------------|------------|------|------|------|
| General Information                              |                                       |      |     |   |           |   |     | Site Information           |            |   |   |                         |            |      |      |      |
| Analyst                                          | DBZ                                   |      |     |   |           |   |     | Intersection               |            |   |   | Thixton at Pebble Trace |            |      |      |      |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |      |     |   |           |   |     | Jurisdiction               |            |   |   |                         |            |      |      |      |
| Date Performed                                   | 9/19/2021                             |      |     |   |           |   |     | East/West Street           |            |   |   | Thixton Lane            |            |      |      |      |
| Analysis Year                                    | 2021                                  |      |     |   |           |   |     | North/South Street         |            |   |   | Pebble Trace            |            |      |      |      |
| Time Analyzed                                    | PM Peak                               |      |     |   |           |   |     | Peak Hour Factor           |            |   |   | 0.92                    |            |      |      |      |
| Intersection Orientation                         | East-West                             |      |     |   |           |   |     | Analysis Time Period (hrs) |            |   |   | 0.25                    |            |      |      |      |
| Project Description                              | Oak Grove                             |      |     |   |           |   |     |                            |            |   |   |                         |            |      |      |      |
| <b>Lanes</b>                                     |                                       |      |     |   |           |   |     |                            |            |   |   |                         |            |      |      |      |
|                                                  |                                       |      |     |   |           |   |     |                            |            |   |   |                         |            |      |      |      |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |      |     |   |           |   |     |                            |            |   |   |                         |            |      |      |      |
| Approach                                         | Eastbound                             |      |     |   | Westbound |   |     |                            | Northbound |   |   |                         | Southbound |      |      |      |
| Movement                                         | U                                     | L    | T   | R | U         | L | T   | R                          | U          | L | T | R                       | U          | L    | T    | R    |
| Priority                                         | 1U                                    | 1    | 2   | 3 | 4U        | 4 | 5   | 6                          |            | 7 | 8 | 9                       |            | 10   | 11   | 12   |
| Number of Lanes                                  | 0                                     | 0    | 1   | 0 | 0         | 0 | 1   | 0                          |            | 0 | 0 | 0                       |            | 0    | 1    | 0    |
| Configuration                                    |                                       | LT   |     |   |           |   |     | TR                         |            |   |   |                         |            |      | LR   |      |
| Volume (veh/h)                                   |                                       | 22   | 144 |   |           |   | 114 | 34                         |            |   |   |                         |            | 19   |      | 9    |
| Percent Heavy Vehicles (%)                       |                                       | 5    |     |   |           |   |     |                            |            |   |   |                         |            | 5    |      | 11   |
| Proportion Time Blocked                          |                                       |      |     |   |           |   |     |                            |            |   |   |                         |            |      |      |      |
| Percent Grade (%)                                |                                       |      |     |   |           |   |     |                            |            |   |   |                         | 0          |      |      |      |
| Right Turn Channelized                           |                                       |      |     |   |           |   |     |                            |            |   |   |                         |            |      |      |      |
| Median Type   Storage                            | Undivided                             |      |     |   |           |   |     |                            |            |   |   |                         |            |      |      |      |
| <b>Critical and Follow-up Headways</b>           |                                       |      |     |   |           |   |     |                            |            |   |   |                         |            |      |      |      |
| Base Critical Headway (sec)                      |                                       | 4.1  |     |   |           |   |     |                            |            |   |   |                         |            | 7.1  |      | 6.2  |
| Critical Headway (sec)                           |                                       | 4.15 |     |   |           |   |     |                            |            |   |   |                         |            | 6.45 |      | 6.31 |
| Base Follow-Up Headway (sec)                     |                                       | 2.2  |     |   |           |   |     |                            |            |   |   |                         |            | 3.5  |      | 3.3  |
| Follow-Up Headway (sec)                          |                                       | 2.25 |     |   |           |   |     |                            |            |   |   |                         |            | 3.55 |      | 3.40 |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |      |     |   |           |   |     |                            |            |   |   |                         |            |      |      |      |
| Flow Rate, v (veh/h)                             |                                       | 24   |     |   |           |   |     |                            |            |   |   |                         |            |      | 30   |      |
| Capacity, c (veh/h)                              |                                       | 1400 |     |   |           |   |     |                            |            |   |   |                         |            |      | 695  |      |
| v/c Ratio                                        |                                       | 0.02 |     |   |           |   |     |                            |            |   |   |                         |            |      | 0.04 |      |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       | 0.1  |     |   |           |   |     |                            |            |   |   |                         |            |      | 0.1  |      |
| Control Delay (s/veh)                            |                                       | 7.6  |     |   |           |   |     |                            |            |   |   |                         |            |      | 10.4 |      |
| Level of Service (LOS)                           |                                       | A    |     |   |           |   |     |                            |            |   |   |                         |            |      | B    |      |
| Approach Delay (s/veh)                           | 1.1                                   |      |     |   |           |   |     |                            |            |   |   |                         | 10.4       |      |      |      |
| Approach LOS                                     |                                       |      |     |   |           |   |     |                            |            |   |   |                         | B          |      |      |      |



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| HCS7 Two-Way Stop-Control Report                                                                                 |                                       |      |     |   |           |   |     |                            |            |   |   |                         |            |   |      |      |      |
|------------------------------------------------------------------------------------------------------------------|---------------------------------------|------|-----|---|-----------|---|-----|----------------------------|------------|---|---|-------------------------|------------|---|------|------|------|
| General Information                                                                                              |                                       |      |     |   |           |   |     | Site Information           |            |   |   |                         |            |   |      |      |      |
| Analyst                                                                                                          | DBZ                                   |      |     |   |           |   |     | Intersection               |            |   |   | Thixton at Pebble Trace |            |   |      |      |      |
| Agency/Co.                                                                                                       | Diane B Zimmerman Traffic Engineering |      |     |   |           |   |     | Jurisdiction               |            |   |   |                         |            |   |      |      |      |
| Date Performed                                                                                                   | 9/19/2021                             |      |     |   |           |   |     | East/West Street           |            |   |   | Thixton Lane            |            |   |      |      |      |
| Analysis Year                                                                                                    | 2027                                  |      |     |   |           |   |     | North/South Street         |            |   |   | Pebble Trace            |            |   |      |      |      |
| Time Analyzed                                                                                                    | PM Peak No Build                      |      |     |   |           |   |     | Peak Hour Factor           |            |   |   | 0.92                    |            |   |      |      |      |
| Intersection Orientation                                                                                         | East-West                             |      |     |   |           |   |     | Analysis Time Period (hrs) |            |   |   | 0.25                    |            |   |      |      |      |
| Project Description                                                                                              | Oak Grove                             |      |     |   |           |   |     |                            |            |   |   |                         |            |   |      |      |      |
| <b>Lanes</b>                                                                                                     |                                       |      |     |   |           |   |     |                            |            |   |   |                         |            |   |      |      |      |
|  <p>Major Street: East-West</p> |                                       |      |     |   |           |   |     |                            |            |   |   |                         |            |   |      |      |      |
| <b>Vehicle Volumes and Adjustments</b>                                                                           |                                       |      |     |   |           |   |     |                            |            |   |   |                         |            |   |      |      |      |
| Approach                                                                                                         | Eastbound                             |      |     |   | Westbound |   |     |                            | Northbound |   |   |                         | Southbound |   |      |      |      |
| Movement                                                                                                         | U                                     | L    | T   | R | U         | L | T   | R                          | U          | L | T | R                       | U          | L | T    | R    |      |
| Priority                                                                                                         | 1U                                    | 1    | 2   | 3 | 4U        | 4 | 5   | 6                          |            |   | 7 | 8                       | 9          |   | 10   | 11   | 12   |
| Number of Lanes                                                                                                  | 0                                     | 0    | 1   | 0 | 0         | 0 | 1   | 0                          |            |   | 0 | 0                       | 0          |   | 0    | 1    | 0    |
| Configuration                                                                                                    |                                       | LT   |     |   |           |   |     | TR                         |            |   |   |                         |            |   |      | LR   |      |
| Volume (veh/h)                                                                                                   |                                       | 22   | 162 |   |           |   | 128 | 34                         |            |   |   |                         |            |   | 19   |      | 9    |
| Percent Heavy Vehicles (%)                                                                                       |                                       | 5    |     |   |           |   |     |                            |            |   |   |                         |            |   | 5    |      | 11   |
| Proportion Time Blocked                                                                                          |                                       |      |     |   |           |   |     |                            |            |   |   |                         |            |   |      |      |      |
| Percent Grade (%)                                                                                                |                                       |      |     |   |           |   |     |                            |            |   |   |                         | 0          |   |      |      |      |
| Right Turn Channelized                                                                                           |                                       |      |     |   |           |   |     |                            |            |   |   |                         |            |   |      |      |      |
| Median Type   Storage                                                                                            | Undivided                             |      |     |   |           |   |     |                            |            |   |   |                         |            |   |      |      |      |
| <b>Critical and Follow-up Headways</b>                                                                           |                                       |      |     |   |           |   |     |                            |            |   |   |                         |            |   |      |      |      |
| Base Critical Headway (sec)                                                                                      |                                       | 4.1  |     |   |           |   |     |                            |            |   |   |                         |            |   | 7.1  |      | 6.2  |
| Critical Headway (sec)                                                                                           |                                       | 4.15 |     |   |           |   |     |                            |            |   |   |                         |            |   | 6.45 |      | 6.31 |
| Base Follow-Up Headway (sec)                                                                                     |                                       | 2.2  |     |   |           |   |     |                            |            |   |   |                         |            |   | 3.5  |      | 3.3  |
| Follow-Up Headway (sec)                                                                                          |                                       | 2.25 |     |   |           |   |     |                            |            |   |   |                         |            |   | 3.55 |      | 3.40 |
| <b>Delay, Queue Length, and Level of Service</b>                                                                 |                                       |      |     |   |           |   |     |                            |            |   |   |                         |            |   |      |      |      |
| Flow Rate, v (veh/h)                                                                                             |                                       | 24   |     |   |           |   |     |                            |            |   |   |                         |            |   |      | 30   |      |
| Capacity, c (veh/h)                                                                                              |                                       | 1382 |     |   |           |   |     |                            |            |   |   |                         |            |   |      | 668  |      |
| v/c Ratio                                                                                                        |                                       | 0.02 |     |   |           |   |     |                            |            |   |   |                         |            |   |      | 0.05 |      |
| 95% Queue Length, Q <sub>95</sub> (veh)                                                                          |                                       | 0.1  |     |   |           |   |     |                            |            |   |   |                         |            |   |      | 0.1  |      |
| Control Delay (s/veh)                                                                                            |                                       | 7.7  |     |   |           |   |     |                            |            |   |   |                         |            |   |      | 10.6 |      |
| Level of Service (LOS)                                                                                           |                                       | A    |     |   |           |   |     |                            |            |   |   |                         |            |   |      | B    |      |
| Approach Delay (s/veh)                                                                                           | 1.0                                   |      |     |   |           |   |     |                            |            |   |   |                         | 10.6       |   |      |      |      |
| Approach LOS                                                                                                     |                                       |      |     |   |           |   |     |                            |            |   |   |                         | B          |   |      |      |      |



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| HCS7 Two-Way Stop-Control Report                 |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
|--------------------------------------------------|---------------------------------------|------|-----|---|-----------|---|-----|----------------------------|-------------------------|---|---|---|------------|------|------|------|
| General Information                              |                                       |      |     |   |           |   |     | Site Information           |                         |   |   |   |            |      |      |      |
| Analyst                                          | DBZ                                   |      |     |   |           |   |     | Intersection               | Thixton at Pebble Trace |   |   |   |            |      |      |      |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |      |     |   |           |   |     | Jurisdiction               |                         |   |   |   |            |      |      |      |
| Date Performed                                   | 5/9/2022                              |      |     |   |           |   |     | East/West Street           | Thixton Lane            |   |   |   |            |      |      |      |
| Analysis Year                                    | 2027                                  |      |     |   |           |   |     | North/South Street         | Pebble Trace            |   |   |   |            |      |      |      |
| Time Analyzed                                    | PM Peak Build                         |      |     |   |           |   |     | Peak Hour Factor           | 0.92                    |   |   |   |            |      |      |      |
| Intersection Orientation                         | East-West                             |      |     |   |           |   |     | Analysis Time Period (hrs) | 0.25                    |   |   |   |            |      |      |      |
| Project Description                              | Oak Grove                             |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| <b>Lanes</b>                                     |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
|                                                  |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| Approach                                         | Eastbound                             |      |     |   | Westbound |   |     |                            | Northbound              |   |   |   | Southbound |      |      |      |
| Movement                                         | U                                     | L    | T   | R | U         | L | T   | R                          | U                       | L | T | R | U          | L    | T    | R    |
| Priority                                         | 1U                                    | 1    | 2   | 3 | 4U        | 4 | 5   | 6                          |                         | 7 | 8 | 9 |            | 10   | 11   | 12   |
| Number of Lanes                                  | 0                                     | 0    | 1   | 0 | 0         | 0 | 1   | 0                          |                         | 0 | 0 | 0 |            | 0    | 1    | 0    |
| Configuration                                    |                                       | LT   |     |   |           |   |     | TR                         |                         |   |   |   |            |      | LR   |      |
| Volume (veh/h)                                   |                                       | 33   | 183 |   |           |   | 140 | 60                         |                         |   |   |   |            | 34   |      | 16   |
| Percent Heavy Vehicles (%)                       |                                       | 5    |     |   |           |   |     |                            |                         |   |   |   |            | 5    |      | 11   |
| Proportion Time Blocked                          |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| Percent Grade (%)                                | 0                                     |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| Right Turn Channelized                           |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| Median Type   Storage                            | Undivided                             |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| <b>Critical and Follow-up Headways</b>           |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| Base Critical Headway (sec)                      |                                       | 4.1  |     |   |           |   |     |                            |                         |   |   |   |            | 7.1  |      | 6.2  |
| Critical Headway (sec)                           |                                       | 4.15 |     |   |           |   |     |                            |                         |   |   |   |            | 6.45 |      | 6.31 |
| Base Follow-Up Headway (sec)                     |                                       | 2.2  |     |   |           |   |     |                            |                         |   |   |   |            | 3.5  |      | 3.3  |
| Follow-Up Headway (sec)                          |                                       | 2.25 |     |   |           |   |     |                            |                         |   |   |   |            | 3.55 |      | 3.40 |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| Flow Rate, v (veh/h)                             |                                       | 36   |     |   |           |   |     |                            |                         |   |   |   |            |      | 54   |      |
| Capacity, c (veh/h)                              |                                       | 1335 |     |   |           |   |     |                            |                         |   |   |   |            |      | 609  |      |
| v/c Ratio                                        |                                       | 0.03 |     |   |           |   |     |                            |                         |   |   |   |            |      | 0.09 |      |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       | 0.1  |     |   |           |   |     |                            |                         |   |   |   |            |      | 0.3  |      |
| Control Delay (s/veh)                            |                                       | 7.8  |     |   |           |   |     |                            |                         |   |   |   |            |      | 11.5 |      |
| Level of Service (LOS)                           |                                       | A    |     |   |           |   |     |                            |                         |   |   |   |            |      | B    |      |
| Approach Delay (s/veh)                           | 1.4                                   |      |     |   |           |   |     |                            |                         |   |   |   | 11.5       |      |      |      |
| Approach LOS                                     |                                       |      |     |   |           |   |     |                            |                         |   |   |   | B          |      |      |      |



Oak Grove Subdivision  
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| HCS7 Signalized Intersection Results Summary    |       |                                        |     |               |       |                   |                          |                 |       |         |       |      |       |       |    |
|-------------------------------------------------|-------|----------------------------------------|-----|---------------|-------|-------------------|--------------------------|-----------------|-------|---------|-------|------|-------|-------|----|
| General Information                             |       |                                        |     |               |       |                   | Intersection Information |                 |       |         |       |      |       |       |    |
| Agency                                          |       | Diane B. Zimmerman Traffic Engineering |     |               |       |                   | Duration, h              |                 | 0.250 |         |       |      |       |       |    |
| Analyst                                         |       | DBZ                                    |     | Analysis Date |       | 9/19/2021         |                          | Area Type       |       | Other   |       |      |       |       |    |
| Jurisdiction                                    |       |                                        |     | Time Period   |       | AM Peak           |                          | PHF             |       | 0.94    |       |      |       |       |    |
| Urban Street                                    |       | Bardstown Road                         |     | Analysis Year |       | 2021              |                          | Analysis Period |       | 1> 7:00 |       |      |       |       |    |
| Intersection                                    |       | Thixton                                |     | File Name     |       | Thixton AM 21.xus |                          |                 |       |         |       |      |       |       |    |
| Project Description                             |       | Oak Grove                              |     |               |       |                   |                          |                 |       |         |       |      |       |       |    |
| Demand Information                              |       |                                        |     | EB            |       |                   | WB                       |                 |       | NB      |       |      | SB    |       |    |
| Approach Movement                               |       |                                        |     | L             | T     | R                 | L                        | T               | R     | L       | T     | R    | L     | T     | R  |
| Demand ( v ), veh/h                             |       |                                        |     | 97            | 0     | 53                |                          |                 |       | 231     | 1587  |      |       | 758   | 56 |
| Signal Information                              |       |                                        |     |               |       |                   |                          |                 |       |         |       |      |       |       |    |
| Cycle, s                                        | 120.0 | Reference Phase                        | 2   |               |       |                   |                          |                 |       |         |       |      |       |       |    |
| Offset, s                                       | 0     | Reference Point                        | End |               |       |                   |                          |                 |       |         |       |      |       |       |    |
| Uncoordinated                                   | No    | Simult. Gap E/W                        | On  | Green         | 8.8   | 67.6              | 23.4                     | 0.0             | 0.0   | 0.0     |       |      |       |       |    |
|                                                 |       |                                        |     | Yellow        | 3.6   | 5.0               | 3.6                      | 0.0             | 0.0   | 0.0     |       |      |       |       |    |
| Force Mode                                      | Fixed | Simult. Gap N/S                        | On  | Red           | 3.0   | 2.0               | 3.0                      | 0.0             | 0.0   | 0.0     |       |      |       |       |    |
| Timer Results                                   |       |                                        |     | EBL           | EBT   |                   | WBL                      | WBT             |       | NBL     | NBT   |      | SBL   | SBT   |    |
| Assigned Phase                                  |       |                                        |     |               | 4     |                   |                          |                 |       | 5       | 2     |      |       | 6     |    |
| Case Number                                     |       |                                        |     |               | 12.0  |                   |                          |                 |       | 1.0     | 4.0   |      |       | 7.3   |    |
| Phase Duration, s                               |       |                                        |     |               | 30.0  |                   |                          |                 |       | 15.4    | 90.0  |      |       | 74.6  |    |
| Change Period, ( Y+R c ), s                     |       |                                        |     |               | 6.6   |                   |                          |                 |       | 6.6     | 7.0   |      |       | 7.0   |    |
| Max Allow Headway ( MAH ), s                    |       |                                        |     |               | 3.2   |                   |                          |                 |       | 3.0     | 0.0   |      |       | 0.0   |    |
| Queue Clearance Time ( g s ), s                 |       |                                        |     |               | 25.4  |                   |                          |                 |       | 8.7     |       |      |       |       |    |
| Green Extension Time ( g e ), s                 |       |                                        |     |               | 0.0   |                   |                          |                 |       | 0.2     | 0.0   |      |       | 0.0   |    |
| Phase Call Probability                          |       |                                        |     |               | 1.00  |                   |                          |                 |       | 1.00    |       |      |       |       |    |
| Max Out Probability                             |       |                                        |     |               | 1.00  |                   |                          |                 |       | 0.18    |       |      |       |       |    |
| Movement Group Results                          |       |                                        |     | EB            |       |                   | WB                       |                 |       | NB      |       |      | SB    |       |    |
| Approach Movement                               |       |                                        |     | L             | T     | R                 | L                        | T               | R     | L       | T     | R    | L     | T     | R  |
| Assigned Movement                               |       |                                        |     | 7             | 4     | 14                |                          |                 |       | 5       | 2     |      | 6     | 16    |    |
| Adjusted Flow Rate ( v ), veh/h                 |       |                                        |     |               | 160   |                   |                          |                 |       | 246     | 1688  |      | 806   | 60    |    |
| Adjusted Saturation Flow Rate ( s ), veh/h/ln   |       |                                        |     |               | 1707  |                   |                          |                 |       | 1781    | 1766  |      | 1724  | 1547  |    |
| Queue Service Time ( g s ), s                   |       |                                        |     |               | 10.0  |                   |                          |                 |       | 6.7     | 33.9  |      | 16.0  | 2.1   |    |
| Cycle Queue Clearance Time ( g c ), s           |       |                                        |     |               | 10.0  |                   |                          |                 |       | 6.7     | 33.9  |      | 16.0  | 2.1   |    |
| Green Ratio ( g/C )                             |       |                                        |     |               | 0.20  |                   |                          |                 |       | 0.65    | 0.69  |      | 0.56  | 0.56  |    |
| Capacity ( c ), veh/h                           |       |                                        |     |               | 333   |                   |                          |                 |       | 481     | 2444  |      | 1941  | 871   |    |
| Volume-to-Capacity Ratio ( X )                  |       |                                        |     |               | 0.479 |                   |                          |                 |       | 0.510   | 0.691 |      | 0.415 | 0.068 |    |
| Back of Queue ( Q ), ft/ln ( 95 th percentile)  |       |                                        |     |               | 192.6 |                   |                          |                 |       | 102.7   | 422.7 |      | 257   | 32.9  |    |
| Back of Queue ( Q ), veh/ln ( 95 th percentile) |       |                                        |     |               | 7.6   |                   |                          |                 |       | 4.0     | 16.5  |      | 9.8   | 1.3   |    |
| Queue Storage Ratio ( RQ ) ( 95 th percentile)  |       |                                        |     |               | 0.00  |                   |                          |                 |       | 0.34    | 0.00  |      | 0.00  | 0.00  |    |
| Uniform Delay ( d 1 ), s/veh                    |       |                                        |     |               | 42.9  |                   |                          |                 |       | 10.5    | 10.9  |      | 15.0  | 11.9  |    |
| Incremental Delay ( d 2 ), s/veh                |       |                                        |     |               | 0.4   |                   |                          |                 |       | 0.3     | 1.6   |      | 0.7   | 0.2   |    |
| Initial Queue Delay ( d 3 ), s/veh              |       |                                        |     |               | 0.0   |                   |                          |                 |       | 0.0     | 0.0   |      | 0.0   | 0.0   |    |
| Control Delay ( d ), s/veh                      |       |                                        |     |               | 43.3  |                   |                          |                 |       | 10.8    | 12.6  |      | 15.6  | 12.1  |    |
| Level of Service ( LOS )                        |       |                                        |     |               | D     |                   |                          |                 |       | B       | B     |      | B     | B     |    |
| Approach Delay, s/veh / LOS                     |       |                                        |     | 43.3          | D     | 0.0               |                          |                 |       | 12.3    | B     | 15.4 | B     |       |    |
| Intersection Delay, s/veh / LOS                 |       |                                        |     | 14.9          |       |                   |                          |                 | B     |         |       |      |       |       |    |
| Multimodal Results                              |       |                                        |     | EB            |       |                   | WB                       |                 |       | NB      |       |      | SB    |       |    |
| Pedestrian LOS Score / LOS                      |       |                                        |     | 2.33          | B     | 2.32              | B                        | 1.35            | A     | 1.67    | B     |      |       |       |    |
| Bicycle LOS Score / LOS                         |       |                                        |     | 0.75          | A     |                   |                          | 2.08            | B     | 1.20    | A     |      |       |       |    |



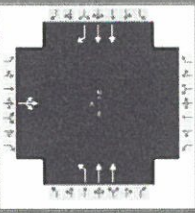
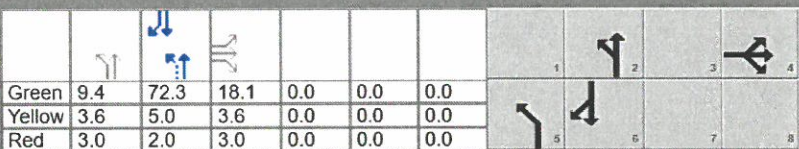
Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Signalized Intersection Results Summary    |                                        |                 |               |                      |       |     |                          |         |      |       |       |   |       |       |    |
|-------------------------------------------------|----------------------------------------|-----------------|---------------|----------------------|-------|-----|--------------------------|---------|------|-------|-------|---|-------|-------|----|
| General Information                             |                                        |                 |               |                      |       |     | Intersection Information |         |      |       |       |   |       |       |    |
| Agency                                          | Diane B. Zimmerman Traffic Engineering |                 |               |                      |       |     | Duration, h              | 0.250   |      |       |       |   |       |       |    |
| Analyst                                         | DBZ                                    |                 | Analysis Date | 9/19/2021            |       |     | Area Type                | Other   |      |       |       |   |       |       |    |
| Jurisdiction                                    |                                        |                 | Time Period   | AM Peak              |       |     | PHF                      | 0.94    |      |       |       |   |       |       |    |
| Urban Street                                    | Bardstown Road                         |                 | Analysis Year | 2027 No Build        |       |     | Analysis Period          | 1> 7:00 |      |       |       |   |       |       |    |
| Intersection                                    | Thixton                                |                 | File Name     | Thixton AM 27 NB.xus |       |     |                          |         |      |       |       |   |       |       |    |
| Project Description                             | Oak Grove                              |                 |               |                      |       |     |                          |         |      |       |       |   |       |       |    |
| Demand Information                              |                                        |                 |               | EB                   |       |     | WB                       |         |      | NB    |       |   | SB    |       |    |
| Approach Movement                               |                                        |                 |               | L                    | T     | R   | L                        | T       | R    | L     | T     | R | L     | T     | R  |
| Demand ( v ), veh/h                             |                                        |                 |               | 109                  | 0     | 60  |                          |         |      | 260   | 1685  |   |       | 805   | 63 |
| Signal Information                              |                                        |                 |               |                      |       |     |                          |         |      |       |       |   |       |       |    |
| Cycle, s                                        | 120.0                                  | Reference Phase | 2             |                      |       |     |                          |         |      |       |       |   |       |       |    |
| Offset, s                                       | 0                                      | Reference Point | End           |                      |       |     |                          |         |      |       |       |   |       |       |    |
| Uncoordinated                                   | No                                     | Simult. Gap E/W | On            |                      |       |     |                          |         |      |       |       |   |       |       |    |
| Force Mode                                      | Fixed                                  | Simult. Gap N/S | On            |                      |       |     |                          |         |      |       |       |   |       |       |    |
| Green                                           | 9.8                                    | 66.6            | 23.4          | 0.0                  | 0.0   | 0.0 |                          |         |      |       |       |   |       |       |    |
| Yellow                                          | 3.6                                    | 5.0             | 3.6           | 0.0                  | 0.0   | 0.0 |                          |         |      |       |       |   |       |       |    |
| Red                                             | 3.0                                    | 2.0             | 3.0           | 0.0                  | 0.0   | 0.0 |                          |         |      |       |       |   |       |       |    |
| Timer Results                                   |                                        |                 |               | EBL                  | EBT   | WBL | WBT                      | NBL     | NBT  | SBL   | SBT   |   |       |       |    |
| Assigned Phase                                  |                                        |                 |               |                      | 4     |     |                          | 5       | 2    |       | 6     |   |       |       |    |
| Case Number                                     |                                        |                 |               |                      | 12.0  |     |                          | 1.0     | 4.0  |       | 7.3   |   |       |       |    |
| Phase Duration, s                               |                                        |                 |               |                      | 30.0  |     |                          | 16.4    | 90.0 |       | 73.6  |   |       |       |    |
| Change Period, ( Y+R c ), s                     |                                        |                 |               |                      | 6.6   |     |                          | 6.6     | 7.0  |       | 7.0   |   |       |       |    |
| Max Allow Headway ( MAH ), s                    |                                        |                 |               |                      | 3.2   |     |                          | 3.0     | 0.0  |       | 0.0   |   |       |       |    |
| Queue Clearance Time ( g s ), s                 |                                        |                 |               |                      | 25.4  |     |                          | 9.6     |      |       |       |   |       |       |    |
| Green Extension Time ( g e ), s                 |                                        |                 |               |                      | 0.0   |     |                          | 0.2     | 0.0  |       | 0.0   |   |       |       |    |
| Phase Call Probability                          |                                        |                 |               |                      | 1.00  |     |                          | 1.00    |      |       |       |   |       |       |    |
| Max Out Probability                             |                                        |                 |               |                      | 1.00  |     |                          | 0.49    |      |       |       |   |       |       |    |
| Movement Group Results                          |                                        |                 |               | EB                   |       |     | WB                       |         |      | NB    |       |   | SB    |       |    |
| Approach Movement                               |                                        |                 |               | L                    | T     | R   | L                        | T       | R    | L     | T     | R | L     | T     | R  |
| Assigned Movement                               |                                        |                 |               | 7                    | 4     | 14  |                          |         |      | 5     | 2     |   | 6     | 16    |    |
| Adjusted Flow Rate ( v ), veh/h                 |                                        |                 |               |                      | 180   |     |                          |         |      | 277   | 1793  |   | 856   | 67    |    |
| Adjusted Saturation Flow Rate ( s ), veh/h/ln   |                                        |                 |               |                      | 1706  |     |                          |         |      | 1781  | 1766  |   | 1724  | 1547  |    |
| Queue Service Time ( g s ), s                   |                                        |                 |               |                      | 11.4  |     |                          |         |      | 7.6   | 38.1  |   | 17.7  | 2.4   |    |
| Cycle Queue Clearance Time ( g c ), s           |                                        |                 |               |                      | 11.4  |     |                          |         |      | 7.6   | 38.1  |   | 17.7  | 2.4   |    |
| Green Ratio ( g/C )                             |                                        |                 |               |                      | 0.20  |     |                          |         |      | 0.65  | 0.69  |   | 0.55  | 0.55  |    |
| Capacity ( c ), veh/h                           |                                        |                 |               |                      | 333   |     |                          |         |      | 469   | 2444  |   | 1913  | 858   |    |
| Volume-to-Capacity Ratio ( X )                  |                                        |                 |               |                      | 0.540 |     |                          |         |      | 0.590 | 0.734 |   | 0.448 | 0.078 |    |
| Back of Queue ( Q ), ft/ln ( 95 th percentile)  |                                        |                 |               |                      | 215.3 |     |                          |         |      | 120.4 | 468.5 |   | 279.6 | 38.3  |    |
| Back of Queue ( Q ), veh/ln ( 95 th percentile) |                                        |                 |               |                      | 8.5   |     |                          |         |      | 4.7   | 18.3  |   | 10.7  | 1.5   |    |
| Queue Storage Ratio ( RQ ) ( 95 th percentile)  |                                        |                 |               |                      | 0.00  |     |                          |         |      | 0.40  | 0.00  |   | 0.00  | 0.00  |    |
| Uniform Delay ( d 1 ), s/veh                    |                                        |                 |               |                      | 43.5  |     |                          |         |      | 11.4  | 11.6  |   | 15.8  | 12.4  |    |
| Incremental Delay ( d 2 ), s/veh                |                                        |                 |               |                      | 1.0   |     |                          |         |      | 0.7   | 2.0   |   | 0.8   | 0.2   |    |
| Initial Queue Delay ( d 3 ), s/veh              |                                        |                 |               |                      | 0.0   |     |                          |         |      | 0.0   | 0.0   |   | 0.0   | 0.0   |    |
| Control Delay ( d ), s/veh                      |                                        |                 |               |                      | 44.4  |     |                          |         |      | 12.1  | 13.6  |   | 16.6  | 12.6  |    |
| Level of Service ( LOS )                        |                                        |                 |               |                      | D     |     |                          |         |      | B     | B     |   | B     | B     |    |
| Approach Delay, s/veh / LOS                     |                                        |                 |               | 44.4                 | D     |     | 0.0                      |         |      | 13.4  | B     |   | 16.3  | B     |    |
| Intersection Delay, s/veh / LOS                 |                                        |                 |               | 16.0                 |       |     |                          |         |      | B     |       |   |       |       |    |
| Multimodal Results                              |                                        |                 |               | EB                   |       |     | WB                       |         |      | NB    |       |   | SB    |       |    |
| Pedestrian LOS Score / LOS                      |                                        |                 |               | 2.33                 | B     |     | 2.32                     | B       |      | 1.35  | A     |   | 1.67  | B     |    |
| Bicycle LOS Score / LOS                         |                                        |                 |               | 0.78                 | A     |     |                          |         |      | 2.19  | B     |   | 1.25  | A     |    |



Oak Grove Subdivision  
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### HCS7 Signalized Intersection Results Summary

| General Information                             |                                        |                 |                     |  | Intersection Information                                                           |         |      |      |     |  |       |       |      |       |       |    |      |  |      |   |  |  |
|-------------------------------------------------|----------------------------------------|-----------------|---------------------|--|------------------------------------------------------------------------------------|---------|------|------|-----|-------------------------------------------------------------------------------------|-------|-------|------|-------|-------|----|------|--|------|---|--|--|
| Agency                                          | Diane B. Zimmerman Traffic Engineering |                 |                     |  | Duration, h                                                                        | 0.250   |      |      |     |                                                                                     |       |       |      |       |       |    |      |  |      |   |  |  |
| Analyst                                         | DBZ                                    | Analysis Date   | May 9, 2022         |  | Area Type                                                                          | Other   |      |      |     |                                                                                     |       |       |      |       |       |    |      |  |      |   |  |  |
| Jurisdiction                                    |                                        | Time Period     | AM Peak             |  | PHF                                                                                | 0.94    |      |      |     |                                                                                     |       |       |      |       |       |    |      |  |      |   |  |  |
| Urban Street                                    | Bardstown Road                         | Analysis Year   | 2027 Build          |  | Analysis Period                                                                    | 1> 7:00 |      |      |     |                                                                                     |       |       |      |       |       |    |      |  |      |   |  |  |
| Intersection                                    | Thixton                                | File Name       | Thixton AM 27 B.xus |  |                                                                                    |         |      |      |     |                                                                                     |       |       |      |       |       |    |      |  |      |   |  |  |
| Project Description                             | Oak Grove                              |                 |                     |  |                                                                                    |         |      |      |     |                                                                                     |       |       |      |       |       |    |      |  |      |   |  |  |
| Demand Information                              |                                        |                 |                     |  | EB                                                                                 |         |      | WB   |     |                                                                                     | NB    |       |      | SB    |       |    |      |  |      |   |  |  |
| Approach Movement                               |                                        |                 |                     |  | L                                                                                  | T       | R    | L    | T   | R                                                                                   | L     | T     | R    | L     | T     | R  |      |  |      |   |  |  |
| Demand ( v ), veh/h                             |                                        |                 |                     |  | 140                                                                                | 0       | 76   |      |     |                                                                                     | 273   | 1685  |      |       | 805   | 66 |      |  |      |   |  |  |
| Signal Information                              |                                        |                 |                     |  |  |         |      |      |     |                                                                                     |       |       |      |       |       |    |      |  |      |   |  |  |
| Cycle, s                                        | 120.0                                  | Reference Phase | 2                   |  |                                                                                    |         |      |      |     |                                                                                     |       |       |      |       |       |    |      |  |      |   |  |  |
| Offset, s                                       | 0                                      | Reference Point | End                 |  |                                                                                    |         |      |      |     |                                                                                     |       |       |      |       |       |    |      |  |      |   |  |  |
| Uncoordinated                                   | No                                     | Simult. Gap E/W | On                  |  |                                                                                    |         |      |      |     |                                                                                     |       |       |      |       |       |    |      |  |      |   |  |  |
| Force Mode                                      | Fixed                                  | Simult. Gap N/S | On                  |  |                                                                                    |         |      |      |     |                                                                                     |       |       |      |       |       |    |      |  |      |   |  |  |
|                                                 |                                        |                 |                     |  | Green                                                                              | 9.4     | 72.3 | 18.1 | 0.0 | 0.0                                                                                 | 0.0   |       |      |       |       |    |      |  |      |   |  |  |
|                                                 |                                        |                 |                     |  | Yellow                                                                             | 3.6     | 5.0  | 3.6  | 0.0 | 0.0                                                                                 | 0.0   |       |      |       |       |    |      |  |      |   |  |  |
|                                                 |                                        |                 |                     |  | Red                                                                                | 3.0     | 2.0  | 3.0  | 0.0 | 0.0                                                                                 | 0.0   |       |      |       |       |    |      |  |      |   |  |  |
| Timer Results                                   |                                        |                 |                     |  | EBL                                                                                |         | EBT  |      | WBL |                                                                                     | WBT   |       | NBL  |       | NBT   |    | SBL  |  | SBT  |   |  |  |
| Assigned Phase                                  |                                        |                 |                     |  |                                                                                    |         | 4    |      |     |                                                                                     |       |       | 5    |       | 2     |    |      |  | 6    |   |  |  |
| Case Number                                     |                                        |                 |                     |  |                                                                                    |         | 12.0 |      |     |                                                                                     |       |       | 1.0  |       | 4.0   |    |      |  | 7.3  |   |  |  |
| Phase Duration, s                               |                                        |                 |                     |  |                                                                                    |         | 24.7 |      |     |                                                                                     |       |       | 16.0 |       | 95.3  |    |      |  | 79.3 |   |  |  |
| Change Period, ( Y+R c ), s                     |                                        |                 |                     |  |                                                                                    |         | 6.6  |      |     |                                                                                     |       |       | 6.6  |       | 7.0   |    |      |  | 7.0  |   |  |  |
| Max Allow Headway ( MAH ), s                    |                                        |                 |                     |  |                                                                                    |         | 3.2  |      |     |                                                                                     |       |       | 3.0  |       | 0.0   |    |      |  | 0.0  |   |  |  |
| Queue Clearance Time ( g s ), s                 |                                        |                 |                     |  |                                                                                    |         | 17.9 |      |     |                                                                                     |       |       | 9.1  |       |       |    |      |  |      |   |  |  |
| Green Extension Time ( g e ), s                 |                                        |                 |                     |  |                                                                                    |         | 0.2  |      |     |                                                                                     |       |       | 0.4  |       | 0.0   |    |      |  | 0.0  |   |  |  |
| Phase Call Probability                          |                                        |                 |                     |  |                                                                                    |         | 1.00 |      |     |                                                                                     |       |       | 1.00 |       |       |    |      |  |      |   |  |  |
| Max Out Probability                             |                                        |                 |                     |  |                                                                                    |         | 0.12 |      |     |                                                                                     |       |       | 0.00 |       |       |    |      |  |      |   |  |  |
| Movement Group Results                          |                                        |                 |                     |  | EB                                                                                 |         |      | WB   |     |                                                                                     | NB    |       |      | SB    |       |    |      |  |      |   |  |  |
| Approach Movement                               |                                        |                 |                     |  | L                                                                                  | T       | R    | L    | T   | R                                                                                   | L     | T     | R    | L     | T     | R  |      |  |      |   |  |  |
| Assigned Movement                               |                                        |                 |                     |  | 7                                                                                  | 4       | 14   |      |     |                                                                                     | 5     | 2     |      |       | 6     | 16 |      |  |      |   |  |  |
| Adjusted Flow Rate ( v ), veh/h                 |                                        |                 |                     |  | 230                                                                                |         |      |      |     |                                                                                     | 290   | 1793  |      | 856   | 70    |    |      |  |      |   |  |  |
| Adjusted Saturation Flow Rate ( s ), veh/h/ln   |                                        |                 |                     |  | 1707                                                                               |         |      |      |     |                                                                                     | 1781  | 1766  |      | 1724  | 1547  |    |      |  |      |   |  |  |
| Queue Service Time ( g s ), s                   |                                        |                 |                     |  | 15.9                                                                               |         |      |      |     |                                                                                     | 7.1   | 32.6  |      | 15.8  | 2.3   |    |      |  |      |   |  |  |
| Cycle Queue Clearance Time ( g c ), s           |                                        |                 |                     |  | 15.9                                                                               |         |      |      |     |                                                                                     | 7.1   | 32.6  |      | 15.8  | 2.3   |    |      |  |      |   |  |  |
| Green Ratio ( g/C )                             |                                        |                 |                     |  | 0.15                                                                               |         |      |      |     |                                                                                     | 0.70  | 0.74  |      | 0.60  | 0.60  |    |      |  |      |   |  |  |
| Capacity ( c ), veh/h                           |                                        |                 |                     |  | 257                                                                                |         |      |      |     |                                                                                     | 504   | 2601  |      | 2078  | 932   |    |      |  |      |   |  |  |
| Volume-to-Capacity Ratio ( X )                  |                                        |                 |                     |  | 0.894                                                                              |         |      |      |     |                                                                                     | 0.577 | 0.689 |      | 0.412 | 0.075 |    |      |  |      |   |  |  |
| Back of Queue ( Q ), ft/ln ( 95 th percentile)  |                                        |                 |                     |  | 321.2                                                                              |         |      |      |     |                                                                                     | 101.3 | 378.6 |      | 246.7 | 34.4  |    |      |  |      |   |  |  |
| Back of Queue ( Q ), veh/ln ( 95 th percentile) |                                        |                 |                     |  | 12.6                                                                               |         |      |      |     |                                                                                     | 4.0   | 14.8  |      | 9.4   | 1.3   |    |      |  |      |   |  |  |
| Queue Storage Ratio ( RQ ) ( 95 th percentile)  |                                        |                 |                     |  | 0.00                                                                               |         |      |      |     |                                                                                     | 0.34  | 0.00  |      | 0.00  | 0.00  |    |      |  |      |   |  |  |
| Uniform Delay ( d 1 ), s/veh                    |                                        |                 |                     |  | 50.0                                                                               |         |      |      |     |                                                                                     | 8.9   | 8.5   |      | 12.6  | 9.9   |    |      |  |      |   |  |  |
| Incremental Delay ( d 2 ), s/veh                |                                        |                 |                     |  | 18.4                                                                               |         |      |      |     |                                                                                     | 0.4   | 1.5   |      | 0.6   | 0.2   |    |      |  |      |   |  |  |
| Initial Queue Delay ( d 3 ), s/veh              |                                        |                 |                     |  | 0.0                                                                                |         |      |      |     |                                                                                     | 0.0   | 0.0   |      | 0.0   | 0.0   |    |      |  |      |   |  |  |
| Control Delay ( d ), s/veh                      |                                        |                 |                     |  | 68.4                                                                               |         |      |      |     |                                                                                     | 9.3   | 10.0  |      | 13.2  | 10.1  |    |      |  |      |   |  |  |
| Level of Service (LOS)                          |                                        |                 |                     |  | E                                                                                  |         |      |      |     |                                                                                     | A     | B     |      | B     | B     |    |      |  |      |   |  |  |
| Approach Delay, s/veh / LOS                     |                                        |                 |                     |  | 68.4                                                                               |         |      | E    |     |                                                                                     | 9.9   |       |      | A     |       |    | 13.0 |  |      | B |  |  |
| Intersection Delay, s/veh / LOS                 |                                        |                 |                     |  |                                                                                    |         |      | 14.9 |     |                                                                                     |       |       |      | B     |       |    |      |  |      |   |  |  |
| Multimodal Results                              |                                        |                 |                     |  | EB                                                                                 |         |      | WB   |     |                                                                                     | NB    |       |      | SB    |       |    |      |  |      |   |  |  |
| Pedestrian LOS Score / LOS                      |                                        |                 |                     |  | 2.33                                                                               |         |      | B    |     |                                                                                     | 1.34  |       |      | A     |       |    |      |  |      |   |  |  |
| Bicycle LOS Score / LOS                         |                                        |                 |                     |  | 0.87                                                                               |         |      | A    |     |                                                                                     | 2.21  |       |      | B     |       |    |      |  |      |   |  |  |

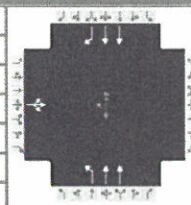


Oak Grove Subdivision  
Traffic Impact Study

### HCS7 Signalized Intersection Results Summary

#### General Information

|                     |                                        |               |                   |                          |         |
|---------------------|----------------------------------------|---------------|-------------------|--------------------------|---------|
| Agency              | Diane B. Zimmerman Traffic Engineering |               |                   | Intersection Information |         |
| Analyst             | DBZ                                    | Analysis Date | 9/19/2021         | Duration, h              | 0.250   |
| Jurisdiction        |                                        | Time Period   | PM Peak           | Area Type                | Other   |
| Urban Street        | Bardstown Road                         | Analysis Year | 2021              | PHF                      | 0.98    |
| Intersection        | Thixton                                | File Name     | Thixton PM 21.xus | Analysis Period          | 1> 4:45 |
| Project Description | Oak Grove                              |               |                   |                          |         |



#### Demand Information

|                   | EB  |   |     | WB |   |   | NB |      |   | SB   |     |   |
|-------------------|-----|---|-----|----|---|---|----|------|---|------|-----|---|
| Approach Movement | L   | T | R   | L  | T | R | L  | T    | R | L    | T   | R |
| Demand (v), veh/h | 106 | 0 | 211 |    |   |   | 97 | 1035 |   | 1841 | 137 |   |

#### Signal Information

|               |       |                 |     |        |     |      |      |     |     |     |  |  |
|---------------|-------|-----------------|-----|--------|-----|------|------|-----|-----|-----|--|--|
| Cycle, s      | 140.0 | Reference Phase | 2   |        |     |      |      |     |     |     |  |  |
| Offset, s     | 0     | Reference Point | End |        |     |      |      |     |     |     |  |  |
| Uncoordinated | No    | Simult. Gap E/W | On  | Green  | 5.9 | 80.5 | 33.4 | 0.0 | 0.0 | 0.0 |  |  |
| Force Mode    | Fixed | Simult. Gap N/S | On  | Yellow | 3.6 | 5.0  | 3.6  | 0.0 | 0.0 | 0.0 |  |  |
|               |       |                 |     | Red    | 3.0 | 2.0  | 3.0  | 0.0 | 0.0 | 0.0 |  |  |

#### Timer Results

|                              | EBL | EBT  | WBL | WBT | NBL  | NBT   | SBL | SBT  |
|------------------------------|-----|------|-----|-----|------|-------|-----|------|
| Assigned Phase               |     | 4    |     |     | 5    | 2     |     | 6    |
| Case Number                  |     | 12.0 |     |     | 1.0  | 4.0   |     | 7.3  |
| Phase Duration, s            |     | 40.0 |     |     | 12.5 | 100.0 |     | 87.5 |
| Change Period, (Y+Rc), s     |     | 6.6  |     |     | 6.6  | 7.0   |     | 7.0  |
| Max Allow Headway (MAH), s   |     | 3.3  |     |     | 3.0  | 0.0   |     | 0.0  |
| Queue Clearance Time (gs), s |     | 35.4 |     |     | 5.0  |       |     |      |
| Green Extension Time (ge), s |     | 0.0  |     |     | 0.1  | 0.0   |     | 0.0  |
| Phase Call Probability       |     | 1.00 |     |     | 0.98 |       |     |      |
| Max Out Probability          |     | 1.00 |     |     | 0.00 |       |     |      |

#### Movement Group Results

|                                              | EB   |       |    | WB   |   |   | NB    |       |   | SB    |       |   |
|----------------------------------------------|------|-------|----|------|---|---|-------|-------|---|-------|-------|---|
| Approach Movement                            | L    | T     | R  | L    | T | R | L     | T     | R | L     | T     | R |
| Assigned Movement                            | 7    | 4     | 14 |      |   |   | 5     | 2     |   | 6     | 16    |   |
| Adjusted Flow Rate (v), veh/h                |      | 323   |    |      |   |   | 99    | 1056  |   | 1879  | 140   |   |
| Adjusted Saturation Flow Rate (s), veh/h/ln  |      | 1620  |    |      |   |   | 1795  | 1781  |   | 1795  | 1572  |   |
| Queue Service Time (gs), s                   |      | 26.6  |    |      |   |   | 3.0   | 19.8  |   | 65.3  | 5.8   |   |
| Cycle Queue Clearance Time (gc), s           |      | 26.6  |    |      |   |   | 3.0   | 19.8  |   | 65.3  | 5.8   |   |
| Green Ratio (g/C)                            |      | 0.24  |    |      |   |   | 0.63  | 0.66  |   | 0.58  | 0.58  |   |
| Capacity (c), veh/h                          |      | 386   |    |      |   |   | 153   | 2366  |   | 2065  | 904   |   |
| Volume-to-Capacity Ratio (X)                 |      | 0.837 |    |      |   |   | 0.646 | 0.446 |   | 0.910 | 0.155 |   |
| Back of Queue (Q), ft/ln (95 th percentile)  |      | 463.5 |    |      |   |   | 89.3  | 293.1 |   | 901.9 | 94    |   |
| Back of Queue (Q), veh/ln (95 th percentile) |      | 18.0  |    |      |   |   | 3.5   | 11.5  |   | 35.8  | 3.7   |   |
| Queue Storage Ratio (RQ) (95 th percentile)  |      | 0.00  |    |      |   |   | 0.30  | 0.00  |   | 0.00  | 0.00  |   |
| Uniform Delay (d1), s/veh                    |      | 50.7  |    |      |   |   | 32.3  | 11.2  |   | 26.5  | 13.9  |   |
| Incremental Delay (d2), s/veh                |      | 14.1  |    |      |   |   | 1.7   | 0.6   |   | 7.4   | 0.4   |   |
| Initial Queue Delay (d3), s/veh              |      | 0.0   |    |      |   |   | 0.0   | 0.0   |   | 0.0   | 0.0   |   |
| Control Delay (d), s/veh                     |      | 64.8  |    |      |   |   | 34.0  | 11.8  |   | 33.9  | 14.2  |   |
| Level of Service (LOS)                       |      | E     |    |      |   |   | C     | B     |   | C     | B     |   |
| Approach Delay, s/veh / LOS                  | 64.8 | E     |    | 0.0  |   |   | 13.7  | B     |   | 32.6  | C     |   |
| Intersection Delay, s/veh / LOS              |      |       |    | 29.3 |   |   |       |       |   | C     |       |   |

#### Multimodal Results

|                            | EB   |   |  | WB   |   |  | NB   |   |  | SB   |   |  |
|----------------------------|------|---|--|------|---|--|------|---|--|------|---|--|
| Pedestrian LOS Score / LOS | 2.33 | B |  | 2.33 | B |  | 1.36 | A |  | 1.67 | B |  |
| Bicycle LOS Score / LOS    | 1.02 | A |  |      |   |  | 1.44 | A |  | 2.15 | B |  |



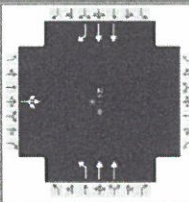
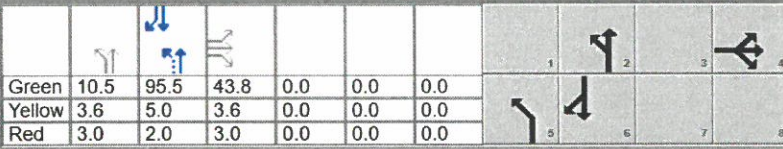
Oak Grove Subdivision  
Traffic Impact Study

### HCS7 Signalized Intersection Results Summary

| General Information                             |                                        |                 |                      | Intersection Information |                 |         |      |      |       |       |       |      |       |       |     |
|-------------------------------------------------|----------------------------------------|-----------------|----------------------|--------------------------|-----------------|---------|------|------|-------|-------|-------|------|-------|-------|-----|
| Agency                                          | Diane B. Zimmerman Traffic Engineering |                 |                      |                          | Duration, h     | 0.250   |      |      |       |       |       |      |       |       |     |
| Analyst                                         | DBZ                                    | Analysis Date   | 9/19/2021            |                          | Area Type       | Other   |      |      |       |       |       |      |       |       |     |
| Jurisdiction                                    |                                        | Time Period     | PM Peak              |                          | PHF             | 0.98    |      |      |       |       |       |      |       |       |     |
| Urban Street                                    | Bardstown Road                         | Analysis Year   | 2027 No Build        |                          | Analysis Period | 1> 4:45 |      |      |       |       |       |      |       |       |     |
| Intersection                                    | Thixton                                | File Name       | Thixton PM 27 NB.xus |                          |                 |         |      |      |       |       |       |      |       |       |     |
| Project Description                             | Oak Grove                              |                 |                      |                          |                 |         |      |      |       |       |       |      |       |       |     |
| Demand Information                              |                                        |                 |                      | EB                       |                 |         | WB   |      |       | NB    |       |      | SB    |       |     |
| Approach Movement                               |                                        |                 |                      | L                        | T               | R       | L    | T    | R     | L     | T     | R    | L     | T     | R   |
| Demand ( v ), veh/h                             |                                        |                 |                      | 119                      | 0               | 238     |      |      |       | 109   | 1099  |      |       | 1954  | 154 |
| Signal Information                              |                                        |                 |                      |                          |                 |         |      |      |       |       |       |      |       |       |     |
| Cycle, s                                        | 170.0                                  | Reference Phase | 2                    |                          |                 |         |      |      |       |       |       |      |       |       |     |
| Offset, s                                       | 0                                      | Reference Point | End                  |                          |                 |         |      |      |       |       |       |      |       |       |     |
| Uncoordinated                                   | No                                     | Simult. Gap E/W | On                   |                          |                 |         |      |      |       |       |       |      |       |       |     |
| Force Mode                                      | Fixed                                  | Simult. Gap N/S | On                   |                          |                 |         |      |      |       |       |       |      |       |       |     |
|                                                 |                                        |                 |                      | Green                    | 6.2             | 103.2   | 40.4 | 0.0  | 0.0   | 0.0   | 0.0   |      |       |       |     |
|                                                 |                                        |                 |                      | Yellow                   | 3.6             | 5.0     | 3.6  | 0.0  | 0.0   | 0.0   | 0.0   |      |       |       |     |
|                                                 |                                        |                 |                      | Red                      | 3.0             | 2.0     | 3.0  | 0.0  | 0.0   | 0.0   | 0.0   |      |       |       |     |
| Timer Results                                   |                                        |                 |                      | EBL                      | EBT             | WBL     | WBT  | NBL  | NBT   | SBL   | SBT   |      |       |       |     |
| Assigned Phase                                  |                                        |                 |                      |                          | 4               |         |      | 5    | 2     |       | 6     |      |       |       |     |
| Case Number                                     |                                        |                 |                      |                          | 12.0            |         |      | 1.0  | 4.0   |       | 7.3   |      |       |       |     |
| Phase Duration, s                               |                                        |                 |                      |                          | 47.0            |         |      | 12.8 | 123.0 |       | 110.2 |      |       |       |     |
| Change Period, ( Y+R c ), s                     |                                        |                 |                      |                          | 6.6             |         |      | 6.6  | 7.0   |       | 7.0   |      |       |       |     |
| Max Allow Headway ( MAH ), s                    |                                        |                 |                      |                          | 3.3             |         |      | 3.0  | 0.0   |       | 0.0   |      |       |       |     |
| Queue Clearance Time ( g s ), s                 |                                        |                 |                      |                          | 39.6            |         |      | 6.0  |       |       |       |      |       |       |     |
| Green Extension Time ( g e ), s                 |                                        |                 |                      |                          | 0.8             |         |      | 0.2  | 0.0   |       | 0.0   |      |       |       |     |
| Phase Call Probability                          |                                        |                 |                      |                          | 1.00            |         |      | 0.99 |       |       |       |      |       |       |     |
| Max Out Probability                             |                                        |                 |                      |                          | 0.00            |         |      | 0.00 |       |       |       |      |       |       |     |
| Movement Group Results                          |                                        |                 |                      | EB                       |                 |         | WB   |      |       | NB    |       |      | SB    |       |     |
| Approach Movement                               |                                        |                 |                      | L                        | T               | R       | L    | T    | R     | L     | T     | R    | L     | T     | R   |
| Assigned Movement                               |                                        |                 |                      | 7                        | 4               | 14      |      |      |       | 5     | 2     |      | 6     | 16    |     |
| Adjusted Flow Rate ( v ), veh/h                 |                                        |                 |                      |                          | 364             |         |      |      |       | 111   | 1121  |      | 1994  | 157   |     |
| Adjusted Saturation Flow Rate ( s ), veh/h/ln   |                                        |                 |                      |                          | 1619            |         |      |      |       | 1795  | 1781  |      | 1795  | 1572  |     |
| Queue Service Time ( g s ), s                   |                                        |                 |                      |                          | 37.6            |         |      |      |       | 4.0   | 24.8  |      | 83.5  | 7.4   |     |
| Cycle Queue Clearance Time ( g c ), s           |                                        |                 |                      |                          | 37.6            |         |      |      |       | 4.0   | 24.8  |      | 83.5  | 7.4   |     |
| Green Ratio ( g/C )                             |                                        |                 |                      |                          | 0.24            |         |      |      |       | 0.66  | 0.68  |      | 0.61  | 0.61  |     |
| Capacity ( c ), veh/h                           |                                        |                 |                      |                          | 385             |         |      |      |       | 133   | 2430  |      | 2178  | 954   |     |
| Volume-to-Capacity Ratio ( X )                  |                                        |                 |                      |                          | 0.946           |         |      |      |       | 0.836 | 0.462 |      | 0.915 | 0.165 |     |
| Back of Queue ( Q ), ft/ln ( 95 th percentile)  |                                        |                 |                      |                          | 582.9           |         |      |      |       | 136.9 | 367.1 |      | 1139  | 123.6 |     |
| Back of Queue ( Q ), veh/ln ( 95 th percentile) |                                        |                 |                      |                          | 22.6            |         |      |      |       | 5.4   | 14.5  |      | 45.2  | 4.8   |     |
| Queue Storage Ratio ( RQ ) ( 95 th percentile)  |                                        |                 |                      |                          | 0.00            |         |      |      |       | 0.46  | 0.00  |      | 0.00  | 0.00  |     |
| Uniform Delay ( d 1 ), s/veh                    |                                        |                 |                      |                          | 63.7            |         |      |      |       | 41.9  | 12.5  |      | 29.6  | 14.6  |     |
| Incremental Delay ( d 2 ), s/veh                |                                        |                 |                      |                          | 5.4             |         |      |      |       | 5.2   | 0.6   |      | 7.5   | 0.4   |     |
| Initial Queue Delay ( d 3 ), s/veh              |                                        |                 |                      |                          | 0.0             |         |      |      |       | 0.0   | 0.0   |      | 0.0   | 0.0   |     |
| Control Delay ( d ), s/veh                      |                                        |                 |                      |                          | 69.1            |         |      |      |       | 47.1  | 13.2  |      | 37.0  | 15.0  |     |
| Level of Service (LOS)                          |                                        |                 |                      |                          | E               |         |      |      |       | D     | B     |      | D     | B     |     |
| Approach Delay, s/veh / LOS                     |                                        |                 |                      | 69.1                     | E               | 0.0     |      |      |       | 16.2  | B     | 35.4 | D     |       |     |
| Intersection Delay, s/veh / LOS                 |                                        |                 |                      | 32.4                     |                 |         |      |      | C     |       |       |      |       |       |     |
| Multimodal Results                              |                                        |                 |                      | EB                       |                 |         | WB   |      |       | NB    |       |      | SB    |       |     |
| Pedestrian LOS Score / LOS                      |                                        |                 |                      | 2.34                     | B               | 2.34    | B    | 1.37 | A     | 1.68  | B     |      |       |       |     |
| Bicycle LOS Score / LOS                         |                                        |                 |                      | 1.09                     | A               |         |      | 1.50 | B     | 2.26  | B     |      |       |       |     |



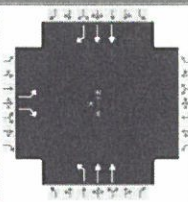
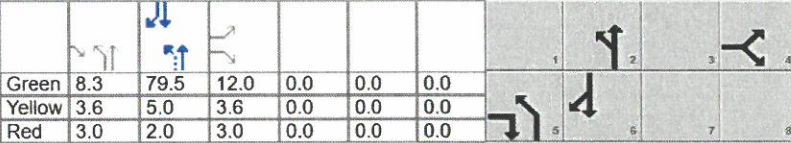
Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Signalized Intersection Results Summary    |                                        |                 |               |                                                                                    |      |      |                 |                          |       |       |       |                                                                                     |        |       |     |
|-------------------------------------------------|----------------------------------------|-----------------|---------------|------------------------------------------------------------------------------------|------|------|-----------------|--------------------------|-------|-------|-------|-------------------------------------------------------------------------------------|--------|-------|-----|
| General Information                             |                                        |                 |               |                                                                                    |      |      |                 | Intersection Information |       |       |       |  |        |       |     |
| Agency                                          | Diane B. Zimmerman Traffic Engineering |                 |               |                                                                                    |      |      |                 | Duration, h              | 0.250 |       |       |                                                                                     |        |       |     |
| Analyst                                         | DBZ                                    |                 | Analysis Date | May 9, 2022                                                                        |      |      | Area Type       | Other                    |       |       |       |                                                                                     |        |       |     |
| Jurisdiction                                    |                                        |                 | Time Period   | PM Peak                                                                            |      |      | PHF             | 0.98                     |       |       |       |                                                                                     |        |       |     |
| Urban Street                                    | Bardstown Road                         |                 | Analysis Year | 2027 Build                                                                         |      |      | Analysis Period | 1> 4:45                  |       |       |       |                                                                                     |        |       |     |
| Intersection                                    | Thixton                                |                 | File Name     | Thixton PM 27 B.xus                                                                |      |      |                 |                          |       |       |       |                                                                                     |        |       |     |
| Project Description                             | Oak Grove                              |                 |               |                                                                                    |      |      |                 |                          |       |       |       |                                                                                     |        |       |     |
| Demand Information                              |                                        |                 |               | EB                                                                                 |      |      | WB              |                          |       | NB    |       |                                                                                     | SB     |       |     |
| Approach Movement                               |                                        |                 |               | L                                                                                  | T    | R    | L               | T                        | R     | L     | T     | R                                                                                   | L      | T     | R   |
| Demand ( v ), veh/h                             |                                        |                 |               | 130                                                                                | 0    | 259  |                 |                          |       | 132   | 1099  |                                                                                     |        | 1954  | 186 |
| Signal Information                              |                                        |                 |               |  |      |      |                 |                          |       |       |       |                                                                                     |        |       |     |
| Cycle, s                                        | 170.0                                  | Reference Phase | 2             |                                                                                    |      |      |                 |                          |       |       |       |                                                                                     |        |       |     |
| Offset, s                                       | 0                                      | Reference Point | End           |                                                                                    |      |      |                 |                          |       |       |       |                                                                                     |        |       |     |
| Uncoordinated                                   | No                                     | Simult. Gap E/W | On            |                                                                                    |      |      |                 |                          |       |       |       |                                                                                     |        |       |     |
| Force Mode                                      | Fixed                                  | Simult. Gap N/S | On            |                                                                                    |      |      |                 |                          |       |       |       |                                                                                     |        |       |     |
|                                                 |                                        |                 |               | Green                                                                              | 10.5 | 95.5 | 43.8            | 0.0                      | 0.0   | 0.0   |       |                                                                                     |        |       |     |
|                                                 |                                        |                 |               | Yellow                                                                             | 3.6  | 5.0  | 3.6             | 0.0                      | 0.0   | 0.0   |       |                                                                                     |        |       |     |
|                                                 |                                        |                 |               | Red                                                                                | 3.0  | 2.0  | 3.0             | 0.0                      | 0.0   | 0.0   |       |                                                                                     |        |       |     |
| Timer Results                                   |                                        |                 |               | EBL                                                                                | EBT  | WBL  | WBT             | NBL                      | NBT   | SBL   | SBT   |                                                                                     |        |       |     |
| Assigned Phase                                  |                                        |                 |               |                                                                                    | 4    |      |                 | 5                        | 2     |       | 6     |                                                                                     |        |       |     |
| Case Number                                     |                                        |                 |               |                                                                                    | 12.0 |      |                 | 1.0                      | 4.0   |       | 7.3   |                                                                                     |        |       |     |
| Phase Duration, s                               |                                        |                 |               |                                                                                    | 50.4 |      |                 | 17.1                     | 119.6 |       | 102.5 |                                                                                     |        |       |     |
| Change Period, ( Y+R c ), s                     |                                        |                 |               |                                                                                    | 6.6  |      |                 | 6.6                      | 7.0   |       | 7.0   |                                                                                     |        |       |     |
| Max Allow Headway ( MAH ), s                    |                                        |                 |               |                                                                                    | 3.3  |      |                 | 3.0                      | 0.0   |       | 0.0   |                                                                                     |        |       |     |
| Queue Clearance Time ( g s ), s                 |                                        |                 |               |                                                                                    | 43.0 |      |                 | 10.3                     |       |       |       |                                                                                     |        |       |     |
| Green Extension Time ( g e ), s                 |                                        |                 |               |                                                                                    | 0.9  |      |                 | 0.2                      | 0.0   |       | 0.0   |                                                                                     |        |       |     |
| Phase Call Probability                          |                                        |                 |               |                                                                                    | 1.00 |      |                 | 1.00                     |       |       |       |                                                                                     |        |       |     |
| Max Out Probability                             |                                        |                 |               |                                                                                    | 0.00 |      |                 | 0.00                     |       |       |       |                                                                                     |        |       |     |
| Movement Group Results                          |                                        |                 |               | EB                                                                                 |      |      | WB              |                          |       | NB    |       |                                                                                     | SB     |       |     |
| Approach Movement                               |                                        |                 |               | L                                                                                  | T    | R    | L               | T                        | R     | L     | T     | R                                                                                   | L      | T     | R   |
| Assigned Movement                               |                                        |                 |               | 7                                                                                  | 4    | 14   |                 |                          |       | 5     | 2     |                                                                                     | 6      | 16    |     |
| Adjusted Flow Rate ( v ), veh/h                 |                                        |                 |               | 397                                                                                |      |      |                 |                          |       | 135   | 1121  |                                                                                     | 1994   | 190   |     |
| Adjusted Saturation Flow Rate ( s ), veh/h/ln   |                                        |                 |               | 1620                                                                               |      |      |                 |                          |       | 1795  | 1781  |                                                                                     | 1795   | 1572  |     |
| Queue Service Time ( g s ), s                   |                                        |                 |               | 41.0                                                                               |      |      |                 |                          |       | 8.3   | 26.4  |                                                                                     | 93.1   | 10.2  |     |
| Cycle Queue Clearance Time ( g c ), s           |                                        |                 |               | 41.0                                                                               |      |      |                 |                          |       | 8.3   | 26.4  |                                                                                     | 93.1   | 10.2  |     |
| Green Ratio ( g/C )                             |                                        |                 |               | 0.26                                                                               |      |      |                 |                          |       | 0.64  | 0.66  |                                                                                     | 0.56   | 0.56  |     |
| Capacity ( c ), veh/h                           |                                        |                 |               | 418                                                                                |      |      |                 |                          |       | 156   | 2358  |                                                                                     | 2016   | 883   |     |
| Volume-to-Capacity Ratio ( X )                  |                                        |                 |               | 0.950                                                                              |      |      |                 |                          |       | 0.863 | 0.476 |                                                                                     | 0.989  | 0.215 |     |
| Back of Queue ( Q ), ft/ln ( 95 th percentile)  |                                        |                 |               | 625.8                                                                              |      |      |                 |                          |       | 251   | 391.9 |                                                                                     | 1351.8 | 174.4 |     |
| Back of Queue ( Q ), veh/ln ( 95 th percentile) |                                        |                 |               | 24.3                                                                               |      |      |                 |                          |       | 10.0  | 15.4  |                                                                                     | 53.6   | 6.8   |     |
| Queue Storage Ratio ( RQ ) ( 95 th percentile)  |                                        |                 |               | 0.00                                                                               |      |      |                 |                          |       | 0.84  | 0.00  |                                                                                     | 0.00   | 0.00  |     |
| Uniform Delay ( d 1 ), s/veh                    |                                        |                 |               | 62.0                                                                               |      |      |                 |                          |       | 56.4  | 14.2  |                                                                                     | 36.7   | 18.6  |     |
| Incremental Delay ( d 2 ), s/veh                |                                        |                 |               | 5.3                                                                                |      |      |                 |                          |       | 5.4   | 0.7   |                                                                                     | 17.6   | 0.6   |     |
| Initial Queue Delay ( d 3 ), s/veh              |                                        |                 |               | 0.0                                                                                |      |      |                 |                          |       | 0.0   | 0.0   |                                                                                     | 0.0    | 0.0   |     |
| Control Delay ( d ), s/veh                      |                                        |                 |               | 67.3                                                                               |      |      |                 |                          |       | 61.8  | 14.9  |                                                                                     | 54.4   | 19.1  |     |
| Level of Service (LOS)                          |                                        |                 |               | E                                                                                  |      |      |                 |                          |       | E     | B     |                                                                                     | D      | B     |     |
| Approach Delay, s/veh / LOS                     |                                        |                 |               | 67.3                                                                               | E    |      | 0.0             |                          |       | 19.9  | B     |                                                                                     | 51.3   | D     |     |
| Intersection Delay, s/veh / LOS                 |                                        |                 |               | 42.7                                                                               |      |      |                 |                          |       | D     |       |                                                                                     |        |       |     |
| Multimodal Results                              |                                        |                 |               | EB                                                                                 |      |      | WB              |                          |       | NB    |       |                                                                                     | SB     |       |     |
| Pedestrian LOS Score / LOS                      |                                        |                 |               | 2.34                                                                               | B    |      | 2.34            | B                        |       | 1.37  | A     |                                                                                     | 1.68   | B     |     |
| Bicycle LOS Score / LOS                         |                                        |                 |               | 1.14                                                                               | A    |      |                 |                          |       | 1.52  | B     |                                                                                     | 2.29   | B     |     |



Oak Grove Subdivision  
Traffic Impact Study

### HCS7 Signalized Intersection Results Summary

| General Information                             |                                        |                 |                           |  | Intersection Information                                                           |         |       |      |      |  |       |       |      |     |       |       |     |  |      |  |
|-------------------------------------------------|----------------------------------------|-----------------|---------------------------|--|------------------------------------------------------------------------------------|---------|-------|------|------|-------------------------------------------------------------------------------------|-------|-------|------|-----|-------|-------|-----|--|------|--|
| Agency                                          | Diane B. Zimmerman Traffic Engineering |                 |                           |  | Duration, h                                                                        | 0.250   |       |      |      |                                                                                     |       |       |      |     |       |       |     |  |      |  |
| Analyst                                         | DBZ                                    | Analysis Date   | May 9, 2022               |  | Area Type                                                                          | Other   |       |      |      |                                                                                     |       |       |      |     |       |       |     |  |      |  |
| Jurisdiction                                    |                                        | Time Period     | AM Peak                   |  | PHF                                                                                | 0.94    |       |      |      |                                                                                     |       |       |      |     |       |       |     |  |      |  |
| Urban Street                                    | Bardstown Road                         | Analysis Year   | 2027 Build                |  | Analysis Period                                                                    | 1> 7:00 |       |      |      |                                                                                     |       |       |      |     |       |       |     |  |      |  |
| Intersection                                    | Thixton                                | File Name       | Thixton AM 27 B Right.xus |  |                                                                                    |         |       |      |      |                                                                                     |       |       |      |     |       |       |     |  |      |  |
| Project Description                             | Oak Grove Right turn Thixton           |                 |                           |  |                                                                                    |         |       |      |      |                                                                                     |       |       |      |     |       |       |     |  |      |  |
| Demand Information                              |                                        |                 |                           |  | EB                                                                                 |         |       | WB   |      |                                                                                     | NB    |       |      | SB  |       |       |     |  |      |  |
| Approach Movement                               |                                        |                 |                           |  | L                                                                                  | T       | R     | L    | T    | R                                                                                   | L     | T     | R    | L   | T     | R     |     |  |      |  |
| Demand ( v ), veh/h                             |                                        |                 |                           |  | 140                                                                                |         | 76    |      |      |                                                                                     | 273   | 1685  |      |     | 805   | 66    |     |  |      |  |
| Signal Information                              |                                        |                 |                           |  |  |         |       |      |      |                                                                                     |       |       |      |     |       |       |     |  |      |  |
| Cycle, s                                        | 120.0                                  | Reference Phase | 2                         |  |                                                                                    |         |       |      |      |                                                                                     |       |       |      |     |       |       |     |  |      |  |
| Offset, s                                       | 0                                      | Reference Point | End                       |  |                                                                                    |         |       |      |      |                                                                                     |       |       |      |     |       |       |     |  |      |  |
| Uncoordinated                                   | No                                     | Simult. Gap E/W | On                        |  |                                                                                    |         |       |      |      |                                                                                     |       |       |      |     |       |       |     |  |      |  |
| Force Mode                                      | Fixed                                  | Simult. Gap N/S | On                        |  |                                                                                    |         |       |      |      |                                                                                     |       |       |      |     |       |       |     |  |      |  |
|                                                 |                                        |                 |                           |  | Green                                                                              | 8.3     | 79.5  | 12.0 | 0.0  | 0.0                                                                                 | 0.0   |       |      |     |       |       |     |  |      |  |
|                                                 |                                        |                 |                           |  | Yellow                                                                             | 3.6     | 5.0   | 3.6  | 0.0  | 0.0                                                                                 | 0.0   |       |      |     |       |       |     |  |      |  |
|                                                 |                                        |                 |                           |  | Red                                                                                | 3.0     | 2.0   | 3.0  | 0.0  | 0.0                                                                                 | 0.0   |       |      |     |       |       |     |  |      |  |
| Timer Results                                   |                                        |                 |                           |  | EBL                                                                                |         | EBT   |      | WBL  |                                                                                     | WBT   |       | NBL  |     | NBT   |       | SBL |  | SBT  |  |
| Assigned Phase                                  |                                        |                 |                           |  |                                                                                    |         | 4     |      |      |                                                                                     |       |       | 5    |     | 2     |       |     |  | 6    |  |
| Case Number                                     |                                        |                 |                           |  |                                                                                    |         | 9.0   |      |      |                                                                                     |       |       | 1.0  |     | 4.0   |       |     |  | 7.3  |  |
| Phase Duration, s                               |                                        |                 |                           |  |                                                                                    |         | 18.6  |      |      |                                                                                     |       |       | 14.9 |     | 101.4 |       |     |  | 86.5 |  |
| Change Period, ( Y+R c ), s                     |                                        |                 |                           |  |                                                                                    |         | 6.6   |      |      |                                                                                     |       |       | 6.6  |     | 7.0   |       |     |  | 7.0  |  |
| Max Allow Headway ( MAH ), s                    |                                        |                 |                           |  |                                                                                    |         | 3.2   |      |      |                                                                                     |       |       | 3.0  |     | 0.0   |       |     |  | 0.0  |  |
| Queue Clearance Time ( g s ), s                 |                                        |                 |                           |  |                                                                                    |         | 11.7  |      |      |                                                                                     |       |       | 7.9  |     |       |       |     |  |      |  |
| Green Extension Time ( g e ), s                 |                                        |                 |                           |  |                                                                                    |         | 0.3   |      |      |                                                                                     |       |       | 0.4  |     | 0.0   |       |     |  | 0.0  |  |
| Phase Call Probability                          |                                        |                 |                           |  |                                                                                    |         | 1.00  |      |      |                                                                                     |       |       | 1.00 |     |       |       |     |  |      |  |
| Max Out Probability                             |                                        |                 |                           |  |                                                                                    |         | 0.00  |      |      |                                                                                     |       |       | 0.00 |     |       |       |     |  |      |  |
| Movement Group Results                          |                                        |                 |                           |  | EB                                                                                 |         |       | WB   |      |                                                                                     | NB    |       |      | SB  |       |       |     |  |      |  |
| Approach Movement                               |                                        |                 |                           |  | L                                                                                  | T       | R     | L    | T    | R                                                                                   | L     | T     | R    | L   | T     | R     |     |  |      |  |
| Assigned Movement                               |                                        |                 |                           |  | 7                                                                                  |         | 14    |      |      |                                                                                     | 5     | 2     |      |     | 6     | 16    |     |  |      |  |
| Adjusted Flow Rate ( v ), veh/h                 |                                        |                 |                           |  | 149                                                                                |         | 81    |      |      |                                                                                     | 290   | 1793  |      |     | 856   | 70    |     |  |      |  |
| Adjusted Saturation Flow Rate ( s ), veh/h/ln   |                                        |                 |                           |  | 1810                                                                               |         | 1610  |      |      |                                                                                     | 1781  | 1766  |      |     | 1724  | 1547  |     |  |      |  |
| Queue Service Time ( g s ), s                   |                                        |                 |                           |  | 9.7                                                                                |         | 5.3   |      |      |                                                                                     | 5.9   | 26.4  |      |     | 13.4  | 1.9   |     |  |      |  |
| Cycle Queue Clearance Time ( g c ), s           |                                        |                 |                           |  | 9.7                                                                                |         | 5.3   |      |      |                                                                                     | 5.9   | 26.4  |      |     | 13.4  | 1.9   |     |  |      |  |
| Green Ratio ( g/C )                             |                                        |                 |                           |  | 0.10                                                                               |         | 0.17  |      |      |                                                                                     | 0.75  | 0.79  |      |     | 0.66  | 0.66  |     |  |      |  |
| Capacity ( c ), veh/h                           |                                        |                 |                           |  | 181                                                                                |         | 273   |      |      |                                                                                     | 538   | 2779  |      |     | 2283  | 1025  |     |  |      |  |
| Volume-to-Capacity Ratio ( X )                  |                                        |                 |                           |  | 0.822                                                                              |         | 0.296 |      |      |                                                                                     | 0.539 | 0.645 |      |     | 0.375 | 0.069 |     |  |      |  |
| Back of Queue ( Q ), ft/ln ( 95 th percentile)  |                                        |                 |                           |  | 200.8                                                                              |         | 94.7  |      |      |                                                                                     | 74.8  | 275.2 |      |     | 205.7 | 27.4  |     |  |      |  |
| Back of Queue ( Q ), veh/ln ( 95 th percentile) |                                        |                 |                           |  | 8.0                                                                                |         | 3.8   |      |      |                                                                                     | 2.9   | 10.7  |      |     | 7.9   | 1.1   |     |  |      |  |
| Queue Storage Ratio ( RQ ) ( 95 th percentile)  |                                        |                 |                           |  | 0.00                                                                               |         | 0.00  |      |      |                                                                                     | 0.25  | 0.00  |      |     | 0.00  | 0.00  |     |  |      |  |
| Uniform Delay ( d 1 ), s/veh                    |                                        |                 |                           |  | 52.9                                                                               |         | 43.6  |      |      |                                                                                     | 6.3   | 5.6   |      |     | 9.1   | 7.2   |     |  |      |  |
| Incremental Delay ( d 2 ), s/veh                |                                        |                 |                           |  | 3.5                                                                                |         | 0.2   |      |      |                                                                                     | 0.3   | 1.2   |      |     | 0.5   | 0.1   |     |  |      |  |
| Initial Queue Delay ( d 3 ), s/veh              |                                        |                 |                           |  | 0.0                                                                                |         | 0.0   |      |      |                                                                                     | 0.0   | 0.0   |      |     | 0.0   | 0.0   |     |  |      |  |
| Control Delay ( d ), s/veh                      |                                        |                 |                           |  | 56.5                                                                               |         | 43.8  |      |      |                                                                                     | 6.7   | 6.7   |      |     | 9.6   | 7.3   |     |  |      |  |
| Level of Service (LOS)                          |                                        |                 |                           |  | E                                                                                  |         | D     |      |      |                                                                                     | A     | A     |      |     | A     | A     |     |  |      |  |
| Approach Delay, s/veh / LOS                     |                                        |                 |                           |  | 52.0                                                                               |         | D     |      | 0.0  |                                                                                     | 6.7   | A     |      | 9.4 |       | A     |     |  |      |  |
| Intersection Delay, s/veh / LOS                 |                                        |                 |                           |  | 10.7                                                                               |         |       |      |      |                                                                                     | B     |       |      |     |       |       |     |  |      |  |
| Multimodal Results                              |                                        |                 |                           |  | EB                                                                                 |         | WB    |      | NB   |                                                                                     | SB    |       |      |     |       |       |     |  |      |  |
| Pedestrian LOS Score / LOS                      |                                        |                 |                           |  | 2.33                                                                               | B       | 2.32  | B    | 0.64 | A                                                                                   | 1.87  | B     |      |     |       |       |     |  |      |  |
| Bicycle LOS Score / LOS                         |                                        |                 |                           |  |                                                                                    | F       |       |      | 2.21 | B                                                                                   | 1.25  | A     |      |     |       |       |     |  |      |  |



Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Signalized Intersection Results Summary    |       |                                        |     |               |     |                           |      |                          |     |         |       |      |      |       |       |     |  |       |  |
|-------------------------------------------------|-------|----------------------------------------|-----|---------------|-----|---------------------------|------|--------------------------|-----|---------|-------|------|------|-------|-------|-----|--|-------|--|
| General Information                             |       |                                        |     |               |     |                           |      | Intersection Information |     |         |       |      |      |       |       |     |  |       |  |
| Agency                                          |       | Diane B. Zimmerman Traffic Engineering |     |               |     |                           |      | Duration, h              |     | 0.250   |       |      |      |       |       |     |  |       |  |
| Analyst                                         |       | DBZ                                    |     | Analysis Date |     | May 9, 2022               |      | Area Type                |     | Other   |       |      |      |       |       |     |  |       |  |
| Jurisdiction                                    |       |                                        |     | Time Period   |     | PM Peak                   |      | PHF                      |     | 0.98    |       |      |      |       |       |     |  |       |  |
| Urban Street                                    |       | Bardstown Road                         |     | Analysis Year |     | 2027 Build                |      | Analysis Period          |     | 1> 4:45 |       |      |      |       |       |     |  |       |  |
| Intersection                                    |       | Thixton                                |     | File Name     |     | Thixton PM 27 B Right.xus |      |                          |     |         |       |      |      |       |       |     |  |       |  |
| Project Description                             |       | Oak Grove Right                        |     |               |     |                           |      |                          |     |         |       |      |      |       |       |     |  |       |  |
| Demand Information                              |       |                                        |     | EB            |     |                           | WB   |                          |     | NB      |       |      | SB   |       |       |     |  |       |  |
| Approach Movement                               |       |                                        |     | L             | T   | R                         | L    | T                        | R   | L       | T     | R    | L    | T     | R     |     |  |       |  |
| Demand ( v ), veh/h                             |       |                                        |     | 130           |     | 259                       |      |                          |     | 132     | 1099  |      |      | 1954  | 186   |     |  |       |  |
| Signal Information                              |       |                                        |     |               |     |                           |      |                          |     |         |       |      |      |       |       |     |  |       |  |
| Cycle, s                                        | 170.0 | Reference Phase                        | 2   |               |     |                           |      |                          |     |         |       |      |      |       |       |     |  |       |  |
| Offset, s                                       | 0     | Reference Point                        | End |               |     |                           |      |                          |     |         |       |      |      |       |       |     |  |       |  |
| Uncoordinated                                   | No    | Simult. Gap E/W                        | On  |               |     |                           |      |                          |     |         |       |      |      |       |       |     |  |       |  |
| Force Mode                                      | Fixed | Simult. Gap N/S                        | On  |               |     |                           |      |                          |     |         |       |      |      |       |       |     |  |       |  |
|                                                 |       |                                        |     | Green         | 6.1 | 114.5                     | 29.3 | 0.0                      | 0.0 | 0.0     |       |      |      |       |       |     |  |       |  |
|                                                 |       |                                        |     | Yellow        | 3.6 | 5.0                       | 3.6  | 0.0                      | 0.0 | 0.0     |       |      |      |       |       |     |  |       |  |
|                                                 |       |                                        |     | Red           | 3.0 | 2.0                       | 3.0  | 0.0                      | 0.0 | 0.0     |       |      |      |       |       |     |  |       |  |
| Timer Results                                   |       |                                        |     | EBL           |     | EBT                       |      | WBL                      |     | WBT     |       | NBL  |      | NBT   |       | SBL |  | SBT   |  |
| Assigned Phase                                  |       |                                        |     |               |     | 4                         |      |                          |     |         |       | 5    |      | 2     |       |     |  | 6     |  |
| Case Number                                     |       |                                        |     |               |     | 9.0                       |      |                          |     |         |       | 1.0  |      | 4.0   |       |     |  | 7.3   |  |
| Phase Duration, s                               |       |                                        |     |               |     | 35.9                      |      |                          |     |         |       | 12.7 |      | 134.1 |       |     |  | 121.5 |  |
| Change Period, ( Y+R c ), s                     |       |                                        |     |               |     | 6.6                       |      |                          |     |         |       | 6.6  |      | 7.0   |       |     |  | 7.0   |  |
| Max Allow Headway ( MAH ), s                    |       |                                        |     |               |     | 3.3                       |      |                          |     |         |       | 3.0  |      | 0.0   |       |     |  | 0.0   |  |
| Queue Clearance Time ( g s ), s                 |       |                                        |     |               |     | 28.4                      |      |                          |     |         |       | 5.9  |      |       |       |     |  |       |  |
| Green Extension Time ( g e ), s                 |       |                                        |     |               |     | 0.8                       |      |                          |     |         |       | 0.2  |      | 0.0   |       |     |  | 0.0   |  |
| Phase Call Probability                          |       |                                        |     |               |     | 1.00                      |      |                          |     |         |       | 1.00 |      |       |       |     |  |       |  |
| Max Out Probability                             |       |                                        |     |               |     | 0.00                      |      |                          |     |         |       | 0.00 |      |       |       |     |  |       |  |
| Movement Group Results                          |       |                                        |     | EB            |     |                           | WB   |                          |     | NB      |       |      | SB   |       |       |     |  |       |  |
| Approach Movement                               |       |                                        |     | L             | T   | R                         | L    | T                        | R   | L       | T     | R    | L    | T     | R     |     |  |       |  |
| Assigned Movement                               |       |                                        |     | 7             |     | 14                        |      |                          |     | 5       | 2     |      |      | 6     | 16    |     |  |       |  |
| Adjusted Flow Rate ( v ), veh/h                 |       |                                        |     | 133           |     | 264                       |      |                          |     | 135     | 1121  |      |      | 1994  | 190   |     |  |       |  |
| Adjusted Saturation Flow Rate ( s ), veh/h/ln   |       |                                        |     | 1810          |     | 1610                      |      |                          |     | 1795    | 1781  |      |      | 1795  | 1572  |     |  |       |  |
| Queue Service Time ( g s ), s                   |       |                                        |     | 11.1          |     | 26.4                      |      |                          |     | 3.9     | 19.7  |      |      | 69.4  | 7.6   |     |  |       |  |
| Cycle Queue Clearance Time ( g c ), s           |       |                                        |     | 11.1          |     | 26.4                      |      |                          |     | 3.9     | 19.7  |      |      | 69.4  | 7.6   |     |  |       |  |
| Green Ratio ( g/C )                             |       |                                        |     | 0.17          |     | 0.21                      |      |                          |     | 0.72    | 0.75  |      |      | 0.67  | 0.67  |     |  |       |  |
| Capacity ( c ), veh/h                           |       |                                        |     | 312           |     | 335                       |      |                          |     | 164     | 2663  |      |      | 2417  | 1059  |     |  |       |  |
| Volume-to-Capacity Ratio ( X )                  |       |                                        |     | 0.426         |     | 0.789                     |      |                          |     | 0.821   | 0.421 |      |      | 0.825 | 0.179 |     |  |       |  |
| Back of Queue ( Q ), ft/ln ( 95 th percentile)  |       |                                        |     | 222.8         |     | 410.6                     |      |                          |     | 182.4   | 282.4 |      |      | 902.3 | 120.7 |     |  |       |  |
| Back of Queue ( Q ), veh/ln ( 95 th percentile) |       |                                        |     | 8.9           |     | 16.4                      |      |                          |     | 7.2     | 11.1  |      |      | 35.8  | 4.7   |     |  |       |  |
| Queue Storage Ratio ( RQ ) ( 95 th percentile)  |       |                                        |     | 0.00          |     | 0.00                      |      |                          |     | 0.61    | 0.00  |      |      | 0.00  | 0.00  |     |  |       |  |
| Uniform Delay ( d 1 ), s/veh                    |       |                                        |     | 62.8          |     | 63.8                      |      |                          |     | 37.4    | 7.9   |      |      | 20.4  | 10.3  |     |  |       |  |
| Incremental Delay ( d 2 ), s/veh                |       |                                        |     | 0.3           |     | 1.6                       |      |                          |     | 3.8     | 0.5   |      |      | 3.4   | 0.4   |     |  |       |  |
| Initial Queue Delay ( d 3 ), s/veh              |       |                                        |     | 0.0           |     | 0.0                       |      |                          |     | 0.0     | 0.0   |      |      | 0.0   | 0.0   |     |  |       |  |
| Control Delay ( d ), s/veh                      |       |                                        |     | 63.2          |     | 65.4                      |      |                          |     | 41.3    | 8.4   |      |      | 23.8  | 10.7  |     |  |       |  |
| Level of Service (LOS)                          |       |                                        |     | E             |     | E                         |      |                          |     | D       | A     |      |      | C     | B     |     |  |       |  |
| Approach Delay, s/veh / LOS                     |       |                                        |     | 64.7          |     | E                         | 0.0  |                          |     | 11.9    | B     |      | 22.6 |       | C     |     |  |       |  |
| Intersection Delay, s/veh / LOS                 |       |                                        |     | 23.5          |     |                           |      |                          |     | C       |       |      |      |       |       |     |  |       |  |
| Multimodal Results                              |       |                                        |     | EB            |     |                           | WB   |                          |     | NB      |       |      | SB   |       |       |     |  |       |  |
| Pedestrian LOS Score / LOS                      |       |                                        |     | 2.34          |     | B                         | 2.34 |                          | B   | 0.67    |       | A    | 1.89 |       | B     |     |  |       |  |
| Bicycle LOS Score / LOS                         |       |                                        |     |               |     | F                         |      |                          |     | 1.52    |       | B    | 2.29 |       | B     |     |  |       |  |



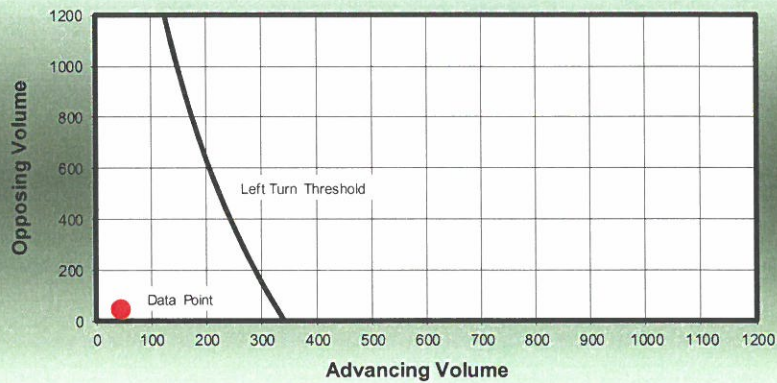
Entrance PM Peak Hour Southbound Approach

### Left Turn Lane Warrants

#### Input Fields

|                        |    |                                          |      |
|------------------------|----|------------------------------------------|------|
| Left Turn Volume (vph) | 25 | Speed Limit (mph)                        | 35   |
| Advancing Volume (vph) | 47 | No. of through lanes                     | 1    |
| Opposing Volume (vph)  | 42 | Percent Heavy Vehicles (decimal percent) | 0.01 |

#### Left Turn Lane Warrants



**Left Turn Lane NOT Warranted**

Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.



Entrance AM Peak Hour Northbound Approach

## Right Turn Lane Warrants

### Input Fields

Right Turn Volume (vph) 42

Speed Limit (mph) 35

Advancing Volume (vph) 61



Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.



## Neighborhood Meeting Summary

A virtual neighborhood meeting was held on Tuesday, April 12, 2022, at 6:00 pm. Those in attendance included the applicant's representatives, Nick Pregliasco, attorney with Bardenwerper, Talbott & Roberts, and David Mindel, land planner and engineer with Mindel Scott and Associates.

Nick Pregliasco started off the virtual neighborhood meeting by showing a Power Point presentation showing the location of the property on both an aerial and LOJIC zoning map, as well as ground level photographs of the site. Nick also explained that this is the second iteration of the plans, as the original application was not approved but instead was remanded back to the Planning Commission for consideration of a scaled back version of the subdivision. Nick explained where the application was currently in the process and to where it was proceeding. The neighbors appeared well-informed about the status of the application and where it was in the zoning process. Nick then explained the new proposed subdivision plan and the reasons for the proposed layout, including the most consequential change from the previous plan, which was the creation of four, five-acre lots at the expense of approximately 80 smaller lots. Nick pointed out that the five-acre lots would be prohibited from being developed into smaller lots in the future through a proposed Binding Element. Nick also described the proposed improvements to the surrounding roadways, including building a right-turn lane at Thixton Lane and Old Bardstown Road/Bardstown Road, and the widening of other roads to a minimum of 18-feet in width. Nick showed the proposed stub connections and right of ways that would be preserved and created on the property. David Mindel then described the sanitary flow design, the water quality, and the tree preservation and tree ordinance and how they affect the property. Nick then opened the floor up for questions, beginning first with the questions that were in the chat and then proceeding to questions from people who wished to unmute and verbally ask questions.

The neighbors' questions regarded three principal areas: lot-size and condition concerns; environmental concerns; traffic and roadway concerns.

Regarding lot-size and condition concerns, neighbors wanted to know if the development could be one-acre lots. David explained that market conditions call for smaller lots, as people do not want to maintain large yards. Neighbors also wanted to know who would be maintaining the five-acre lots, to which Nick and David informed them that the lots were for sale and whoever purchased them and built their residences on them would be responsible for the property's maintenance. Neighbors inquired whether the five-acre lots could be repositioned along Cedar Creek, to which David explained that it would not be feasible to place them there and, additionally, they were placed on the northern side of the property to be adjacent to other five-acre lots. Neighbors also asked whether there would be fences placed between the proposed five-acre lots and the existing five-acre lots as a means of buffering. David explained that there is no obligation to put up fences on these lots as they would be the same size and use. Other neighbors expressed concerns that rezoning to R-4 did not fit with the rural nature of the surrounding properties. Nick explained that the lots were previously zoned R-4 and downzoned to RR in 2008, and this request to rezone is simply to return the properties to their previous zoning.



Regarding environmental concerns, neighbors asked about the creeks, ponds, and waterways throughout the property and how those would be preserved for the wildlife that currently inhabits the property. Neighbors also expressed concern that blasting would occur on the property and disrupt local wildlife and domesticated animals, including the horses that are kept on many people's property. Nick and David explained the blasting process, including when it would occur during the development, how notice would be sent out, and how the people who lived nearby could reach out to the developer to make sure they received notice before blasting occurred. Questions were also posed about the tree canopy, and David explained that there were parts of the plan that included tree preservation, and, additionally, that the required amount of tree canopy would be planted. A neighbor also asked about the ponds on the property, and David discussed that there are a couple of small ponds that may even dry up during a dry season. David explained that an expert has come out to look at potential wetlands, and none of the creeks and ponds were large enough to constitute wetlands. A neighbor asked for the report, and Nick said he would e-mail them to the neighbor. The neighbor said there are endangered animals who live in those creeks and ponds, and even if they aren't big enough to preserve, the developers should be trying to preserve the habitats of these animals. David also showed the neighbors how some tall, white pines that had been planted many years ago and were of interest to the neighbors would be preserved. David noted that developers try to maintain as many trees as possible as they are not only good for the environment, but they also add value to the property.

Regarding the roadways, neighbors were concerned about the width of Independence School Road. Nick explained that we have taken measurements of the road and realize the need to make improvements to get to an 18-foot road. David further explained the need to extend headwalls and to make the road a minimum 18 feet where it is slightly shorter than 18 feet. Regarding roads, another neighbor asked about who would cover the costs of moving telephone poles, mailboxes, paving the roads, and other improvements. Nick reiterated the obligation to widen the road to 18 feet, and David further explained that the need to widen the roads is only by a few inches, so it seems unlikely that too many items would need to be moved. Nonetheless, if something needs to be moved, it will be moved and replaced. A neighbor asked about whether shoulders would be required and whether paving would be done all the way to Bardstown Road. Nick reiterated that the plan calls for improvements on multiple roads surrounding the development with the details being worked out. Other neighbors noted that the surrounding roads are dangerous, including multiple 90-degree turns, and they have had fatalities and wrecks on the roadways. Nick and David showed the improvements that would take place on the roadways to make them safer. David also noted that the stubs and future roadway connections would increase safety as it would give emergency vehicles additional paths of travel. Regarding one of the proposed stubs to Thomas Grove Road, the neighbors were adamant that they did not want it. Nick informed the neighbors of the case manager's information should they wish to inform the case manager of their desire not to have a stub to this private road.

Additionally, a neighbor asked if Louisville Metro Council Member Robin Engel was present. Jared Towns explained that he was here representing Robin Engel. A neighbor expressed dissatisfaction with Engel not being present personally. Nick explained that Council Members



tended to not come to these meetings as the meeting is part of the record that goes to the Planning Commission.

The neighborhood meeting ended at 7:57.





May 4, 2022

Mr. Ben Craven, PLA, ASLA  
Mindell Scott & Associates  
5151 Jefferson Boulevard  
Louisville, Kentucky 40219

Reference: **Oak Grove Subdivision – Karst Survey**  
10212 & 10302 Oak Grove Road  
Louisville, Jefferson County, Kentucky 40291  
ECS Project No. 61-2724

Dear Mr. Craven:

ECS Southeast, LLP (ECS) conducted a karst survey for the referenced site in accordance with ECS Proposal No. 61-P2687, dated April 6, 2021. The karst survey was conducted in general accordance with Chapter 4 Part 9 (Development on Karst Terrain, dated July 2008) of the Louisville-Jefferson County Land Development Code (LDC). The karst survey included the following elements: a visual reconnaissance of site conditions for the karst geologic features defined in the LDC; a review of current and historical aerial photographs; a review of soil survey information; a review of geologic maps; and a review of topographic maps.

**Project Information:**

The site included approximately 68.57 acres of wooded land and open fields with several residential buildings (residences, barns, etc.), ponds, and remnant structures (abandoned residence, shed, well, etc.). Most of the site will be developed into a subdivision with approximately 180 single-family residential lots, two detention basins, and associated roadways. The western boundary area of the site approaching Cedar Creek is steeply sloped and currently wooded. This portion of the site will likely be developed into an open green space in the future.

**Review of Published Documents:**

The following geologic information is based on the review of the Jeffersontown and Mount Washington, 24K Quadrangles, Geologic Map, Kentucky, published by the United States Geological Survey (USGS), and information (aerial photos, geologic maps, and topographic maps, etc.) obtained from the Kentucky Geological Survey (KGS) Geologic Information Service website.

No apparent sinkholes or karst features were reported in the historical aerial photographs, soil survey information, and review of topographic maps. Additionally, no apparent features were mapped within the project area, per KGS. However, one (1) feature was reported approximately 400 feet west of the western property boundary.

**Geology:**

The four (4) formations reportedly underlying the site are "Louisville Limestone", "Waldron Shale", "Laurel Dolomite" and "Osgood Formation and Brassfield Dolomite". The eastern areas of the property, containing existing residences, are underlain by the "Louisville Limestone" and "Waldron Shale" formations. The remainder of the site, including the steeply sloped areas along the western boundary are underlain by the "Laurel Dolomite" formation. Sparse areas to the immediate east of Cedar Creek are underlain by the "Osgood Formation and Brassfield Dolomite" formation.

The majority of the site is reportedly underlain by the "Laurel Dolomite" and "Louisville Limestone" formations, which are designated as having a "Medium" karst potential. The karst potential is based on the tendency for the site to develop or have karst features as shown on the KGS Geologic Map Information Service. Karst potential designation is not definitively indicative of the actual presence or absence of karst activity at the site. According to the KGS



Potential Classification definitions, the development of karst features is variable and dependent on site-specific conditions in formations designated as a “medium” karst potential.

#### **Site Observations:**

A site reconnaissance was conducted over two (2) days on April 14, 2022 and April 15, 2022 by Ben Emery of ECS. Most of the site consisted of sparsely to densely wooded areas, interspersed with open fields, existing residences, and remnant structures. One existing residence, 10302 Oak Grove Road, was located on the eastern portion of the site. The site slopes down toward Cedar Creek along the western property boundary. There is approximately 80 feet of fall across the entire site. A tributary stream, mapped on historical topographic maps, was observed running roughly perpendicular to Cedar Creek on the western side of the site. Three (3) ponds were observed onsite.

Several remnant structures were observed throughout the site, including an abandoned home, a remnant foundation, an abandoned well, an abandoned shed, and several piles of discarded rubble. Remnant structures were in close proximity to one another in the north-central cleared portion of the site. Several drainage swales were observed extending downslope on the western portion of the site (toward Cedar Creek). Swales ranged from 3 to 10 feet wide and were frequently observed to contain exposed apparent rock and moist soils. Four (4) existing springs were observed in the western portion of the site, approaching Cedar Creek. Springs were typically observed to contain 1 to 2 inches of running water that would subsequently flow downslope from the spring to form additional drainage swales.

Rock outcroppings typically consisted of isolated boulders, gentle slopes, and/or flat, at-grade exposures of approximately 1 to 8 feet in height with defined jointing, fractures, and pitting. Outcroppings were typically observed in areas of steep relief (typically EL 580 to 600). Most outcroppings occurred along ridgelines running parallel to Cedar Creek. Boulder to cobble-sized rocks were observed at the base of most outcrops, and solution channels were observed within the exposed apparent rock faces. Fracturing of the upper geologic formations was also observed throughout the western wooded portion of the site. These fractures within apparent rock outcropping are typical in karst terrain.

Fifty-four (54) possible karst-related features were identified onsite. Refer to the attached **Karst Feature Location Plan** and **Site Photos** for the approximate location of observed site features and photos of selected features. Brief descriptions of the features are provided in the table below. Areas and/or features with multiple designations (A, B, C, etc.) represent a series of linear features which appeared to be related to a common joint or similar lineation.

| <b>Feature</b> | <b>Description</b>                                                                                                                                                                                                        | <b>Approximate Dimensions</b> | <b>Approximate Depth</b> |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------------------|
| F-1            | Oval-shaped closed depression containing three (3) smaller closed depressions. Soil sidewalls, no visible throats.                                                                                                        | 30' Diameter                  | 3'                       |
| F-2            | Oval-shaped closed depression underlain by an apparent spring. Audible running water observed below soil bottom. Soil sidewalls observed. Three (3) open throats encountered.                                             | 35' Diameter                  | 3'                       |
| F-3            | Trenchlike closed depression with soil sidewalls and a partially closed throat encountered at the bottom of the depression.                                                                                               | 3' Wide<br>25' Long           | 3.5'                     |
| F-4            | Oval-shaped closed depression with soil sidewalls and two partially closed throats encountered at the bottom of the depression. Exposed metal pipes observed at the bottom of the depression.                             | 17' Diameter                  | 2.5'                     |
| F-5            | Oval-shaped closed depression with soil sidewalls and a partially closed throat encountered at the bottom of the depression. Probe rod extended to apparent rock approximately 3 feet below the bottom of the depression. | 7' Wide<br>17' Long           | 4'                       |



| Feature | Description                                                                                                                                                                                                                                                      | Approximate Dimensions | Approximate Depth |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------|
| F-6     | Small opening with rock sidewalls/bottom. Visible water observed at the bottom of the opening.                                                                                                                                                                   | 1' Diameter            | > 4'              |
| F-7     | Small opening with rock sidewalls/bottom. Visible water observed on the walls of the opening.                                                                                                                                                                    | 2' Diameter            | > 4'              |
| F-8     | Spring, surrounded by outcropped rock, observed in a hillside. 1-2" of running water observed.                                                                                                                                                                   | 6' Wide<br>11' Long    | 3'                |
| F-9     | Small opening with soil sidewalls. Visibly wet.                                                                                                                                                                                                                  | 1' Diameter            | 3'                |
| F-10    | Oval-shaped closed depression with soil sidewalls.                                                                                                                                                                                                               | 2' Diameter            | 2'                |
| F-11    | Spring observed in a hillside. Spring forks into 2 separate drainage channels, which drain to Cedar Creek approximately 40-50 feet to the west. 1'2" of running water observed.                                                                                  | 5' Wide<br>20-30' Long | 6'                |
| F-12    | Oval-shaped closed depression with soil sidewalls. Outcropped rock visible within the center of the depression.                                                                                                                                                  | 12' Diameter           | 4'                |
| F-13    | Oval-shaped closed depression with soil sidewalls. Outcropped rock visible within the center of the depression.                                                                                                                                                  | 16' Diameter           | 3'                |
| F-14    | Oval-shaped closed depression with soil sidewalls. Depression was filled with debris.                                                                                                                                                                            | 22' Diameter           | 3'                |
| F-15    | Oval-shaped closed depression with soil sidewalls and a partially closed throat encountered at the bottom of the depression.                                                                                                                                     | 2.5' Diameter          | 4'                |
| F-16    | Small opening with soil and rock sidewalls, with apparent rock probed at the bottom of the opening.                                                                                                                                                              | 1' Diameter            | 2'                |
| F-17    | Small opening with soil sidewalls. Apparent rock probed at the bottom of the opening.                                                                                                                                                                            | 6" Diameter            | 1.5'              |
| F-18    | Oval-shaped closed depression with soil sidewalls. Probe rod extended to apparent rock approximately 6 inches below the bottom of the depression.                                                                                                                | 4' Diameter            | 2'                |
| F-19    | Small opening with soil and rock sidewalls. Probe rod extended to apparent rock approximately 1 foot below the bottom of the opening.                                                                                                                            | 2' Diameter            | 3'                |
| F-20    | Possible oval-shaped closed depression with rock and soil sidewalls. Probe rod extended to apparent rock approximately 6 inches below the bottom of the depression. Evidence of apparent human disturbance with perimeter of depression lined with stone blocks. | 9' Diameter            | 3'                |
| F-21    | Oval-shaped closed depression with soil sidewalls and a partially closed throat encountered at the bottom of the depression. Probe rod extended to apparent rock approximately 1 foot below the bottom of the depression.                                        | 10' Diameter           | 2.5'              |
| F-22    | Oval-shaped closed depression with soil sidewalls. Depression was filled with debris.                                                                                                                                                                            | 17' Diameter           | 3.5'              |
| F-23    | Oval-shaped closed depression with soil sidewalls. Probe rod extended to apparent rock approximately 3 feet below the bottom of the depression.                                                                                                                  | 7' Diameter            | 4'                |



| Feature | Description                                                                                                                                                                                               |                                                                                                                                                         | Approximate Dimensions | Approximate Depth |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------|
| F-24    | A karst basin that contained two smaller closed depressions.                                                                                                                                              |                                                                                                                                                         | 30' Diameter           | 3'                |
|         | A                                                                                                                                                                                                         | Trenchlike closed depression with soil and rock sidewalls. Probe rod extended to apparent rock approximately 2 feet below the bottom of the depression. | 4' Wide<br>22' Long    | 3'                |
|         | B                                                                                                                                                                                                         | Oval-shaped closed depression with soil and rock sidewalls.                                                                                             | 6' Diameter            | 4'                |
| F-25    | Oval-shaped closed depression with soil sidewalls. Probe rod extended to apparent rock approximately 3 feet below the bottom of the depression.                                                           |                                                                                                                                                         | 7' Diameter            | 3'                |
| F-26    | Oval-shaped closed depression with soil sidewalls and an open throat (1' diameter, > 4' deep) observed at the bottom of the depression. Visible moisture on rock walls of open throat.                    |                                                                                                                                                         | 10' Diameter           | 2.5'              |
| F-27    | Oval-shaped closed depression with soil sidewalls.                                                                                                                                                        |                                                                                                                                                         | 5' Diameter            | 3'                |
| F-28    | Oval-shaped closed depression with soil sidewalls.                                                                                                                                                        |                                                                                                                                                         | 6' Diameter            | 3'                |
| F-29    | Oval-shaped closed depression with soil sidewalls. A partially closed throat with rock sidewalls and bottom (6" diameter, 2' deep) was encountered at the bottom of the depression.                       |                                                                                                                                                         | 6' Diameter            | 5'                |
| F-30    | Oval-shaped closed depression with soil sidewalls. Probe rod extended to apparent rock approximately 1 foot below the bottom of the depression.                                                           |                                                                                                                                                         | 7' Diameter            | 2'                |
| F-31    | Oval-shaped closed depression with soil sidewalls. Probe rod extended to apparent rock approximately 2 feet below the bottom of the depression. A metal pipe (debris) was observed within the depression. |                                                                                                                                                         | 4' Diameter            | 2'                |
| F-32    | Oval-shaped closed depression with soil sidewalls. Probe rod extended to apparent rock approximately 6 inches below the bottom of the depression.                                                         |                                                                                                                                                         | 5' Diameter            | 2'                |
| F-33    | Oval-shaped closed depression with soil sidewalls. Probe rod extended to apparent rock approximately 6 inches below the bottom of the depression.                                                         |                                                                                                                                                         | 4' Diameter            | 2'                |
| F-34    | Oval-shaped closed depression with soil sidewalls, surrounded by small rock outcroppings. Probe rod extended to apparent rock approximately 1 foot below the bottom of the depression.                    |                                                                                                                                                         | 24' Diameter           | 5'                |
| F-35    | Apparent spring observed in a hillside. No water observed, rock outcroppings found throughout outlet area.                                                                                                |                                                                                                                                                         | 4' Wide<br>6-8' Long   | 2-3'              |
| F-36    | Oval-shaped closed depression with soil sidewalls.                                                                                                                                                        |                                                                                                                                                         | 9' Diameter            | 6'                |
| F-37    | Oval-shaped closed depression with soil sidewalls. Probe rod extended to apparent rock approximately 1 foot below the bottom of the depression.                                                           |                                                                                                                                                         | 5' Diameter            | 2'                |
| F-38    | Trenchlike closed depression with rock sidewalls. Depression was filled with debris.                                                                                                                      |                                                                                                                                                         | 4' Wide<br>38' Long    | 3'                |
| F-39    | Spring observed in a hillside. Rock overhang present at outlet area. Less than 1 inch of running water observed.                                                                                          |                                                                                                                                                         | 4' Wide<br>5-8' Long   | 3'                |



| Feature | Description                                                                                                                                                                  | Approximate Dimensions | Approximate Depth |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------|
| F-40    | Oval-shaped closed depression with soil sidewalls. Depression was filled with debris.                                                                                        | 22' Diameter           | 4'                |
| F-41    | Oval-shaped closed depression with soil sidewalls and a partially closed throat observed at the bottom of the depression. Depression was partially filled with debris.       | 8' Diameter            | 5'                |
| F-42    | Oval-shaped closed depression with soil and rock sidewalls.                                                                                                                  | 6' Diameter            | 4'                |
| F-43    | Oval-shaped closed depression with soil and rock sidewalls. Bottom of depression was visibly wet. A partially closed throat was encountered on the bottom of the depression. | 4' Diameter            | 3'                |
| F-44    | Oval-shaped closed depression with soil and rock sidewalls. Probe rod extended to apparent rock approximately 1.5 feet below the bottom of the depression.                   | 5' Diameter            | 3'                |
| F-45    | Oval-shaped closed depression with soil sidewalls. Probe rod extended to apparent rock approximately 3.5 feet below the bottom of the depression.                            | 7' Diameter            | 3'                |
| F-46    | Trenchlike closed depression with soil and rock sidewalls.                                                                                                                   | 3' Wide<br>40' Long    | 2'                |
| F-47    | Trenchlike closed depression with soil and rock sidewalls.                                                                                                                   | 2' Wide<br>7' Long     | 5'                |
| F-48    | Oval-shaped closed depression with soil sidewalls.                                                                                                                           | 4' Diameter            | 2'                |
| F-49    | Trenchlike closed depression with soil and rock sidewalls.                                                                                                                   | 4' Wide<br>8' Long     | 3'                |
| F-50    | Oval-shaped closed depression with soil sidewalls. Probe rod extended to apparent rock approximately 2.5 feet below the bottom of the depression.                            | 7' Diameter            | 4'                |
| F-51    | Small opening with soil sidewalls and a partially closed throat observed at the bottom of the opening.                                                                       | 1' Diameter            | 3'                |
| F-52    | Oval-shaped closed depression with soil and rock sidewalls and a rock bottom. Walls and bottom of depression were visibly wet.                                               | 2.5' Diameter          | 3.5'              |
| F-53    | Oval-shaped closed depression with soil sidewalls. Depression was filled with debris.                                                                                        | 7' Diameter            | 4'                |
| F-54    | Oval-shaped closed depression with soil sidewalls. An open throat (6 inches to 1 foot diameter, 3' deep) with a rock bottom was observed at the bottom of the depression.    | 4' Diameter            | 3'                |

No other karst related features were identified during our site reconnaissance. However, the presence of karst features may be obscured by vegetation and other site features (i.e. fill, wooded areas, structures, or debris). The features identified during this survey should be further evaluated during any subsequent geotechnical exploration(s), or the site development and karst feature remediation phase of the project.



**Karst Feature Remediation Guidelines:**

Typically, karst features in this vicinity and similar to those identified in this survey can be stabilized for development, as needed, for the planned future use of the site. Remediation methods vary based on planned use of the specific area where a karst feature is located and the characteristics of each feature. Treatment methods may vary for features where buildings or other improvements are located, in contrast to features in non-sensitive areas (i.e., pavement or landscaped areas). For this project, the objective of the treatment of a feature is to reduce the risk of future subsidence and to decrease surface water infiltration in and around the active karst feature(s).

An experienced and qualified geotechnical engineer or geologist should be present during remediation to evaluate the characteristics as the feature is excavated, and to recommend specific treatment methods for each feature. Remediation of most karst features identified is anticipated to consist of excavation of the closed depression or slot-features to identify the active feature(s) and determine the appropriate stabilization method. Once the active karst throat or weathered apparent rock area is stabilized, an inverted filter (see attached **Karst Feature Remediation Section**) should be constructed within and over the feature(s).

The filter will reduce future loss of soil into the feature, reducing the risk of subsidence. The area can then be backfilled with clay, with the fill mounded above adjacent grade to reduce surface water infiltration. Clay fill placed above the filter constructed in the karst features should meet the requirements for the "CL" classification, according to the Unified Soil Classification System. The fill should be placed in one-foot lifts and compacted to at least 93% of the Standard Proctor maximum dry density, within 2% of the optimum moisture content. Placement and compaction of the fill in limited horizontal lifts will reduce porosity and surface water infiltration. Periodic observations and compaction testing are recommended to confirm the character and continuity of the clay caps. Grading the site to promote surface drainage in all areas and avoiding ponding water is also important in reducing future subsidence of existing karst features (including sinkholes) and reducing the development of additional karst features.

We appreciate the opportunity to serve as your geotechnical consultants for this project. We look forward to continued association with you in future projects.

Respectfully submitted,  
ECS Southeast, LLP



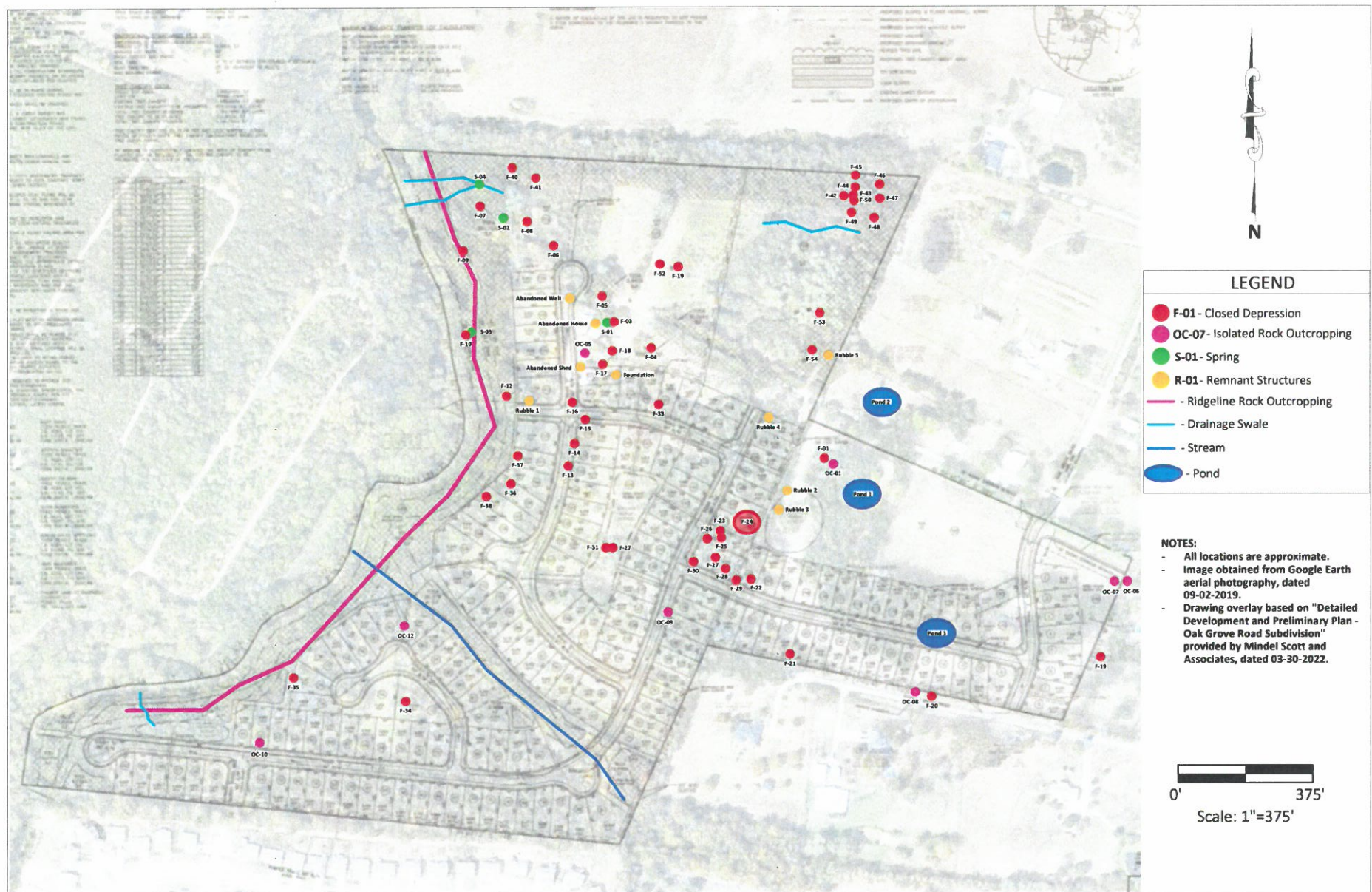
**Ben Emery, E.I.T.**  
Project Manager  
[bemery@ecslimited.com](mailto:bemery@ecslimited.com)



**Liz Blandford Newcomb, P.E.**  
Principal Engineer  
[newcomb@ecslimited.com](mailto:newcomb@ecslimited.com)

Attachments: Karst Feature Location Plan(s) – 4 pages  
Karst Potential Map (obtained from KGS Geologic Map Information Service website) – 1 page  
Site Photos – 11 pages  
Karst Feature Remediation Section – 1 page





**Feature Location Plan - Overview**  
 Oak Grove Subdivision - Karst Survey  
 10212 & 10302 Oak Grove Road  
 Louisville, Jefferson County, Kentucky, 40291

Project No.: 61-2724

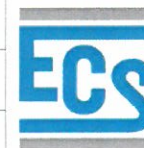
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Drawing No.: FLP

Checked By: FEN

Date: 05/04/2022

Scale: As Shown

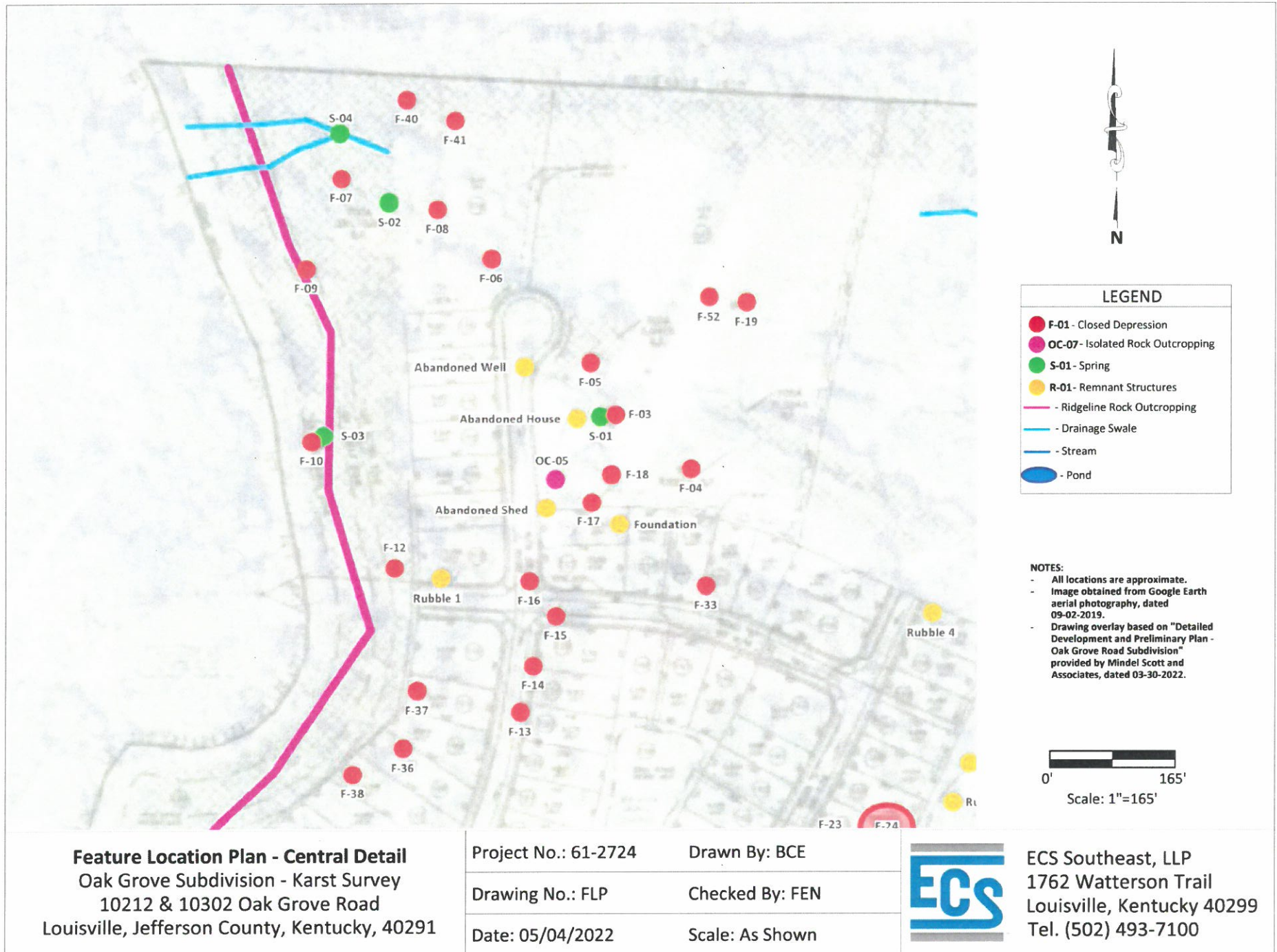


ECS Southeast, LLP  
 1762 Watterson Trail  
 Louisville, Kentucky 40299  
 Tel. (502) 493-7100

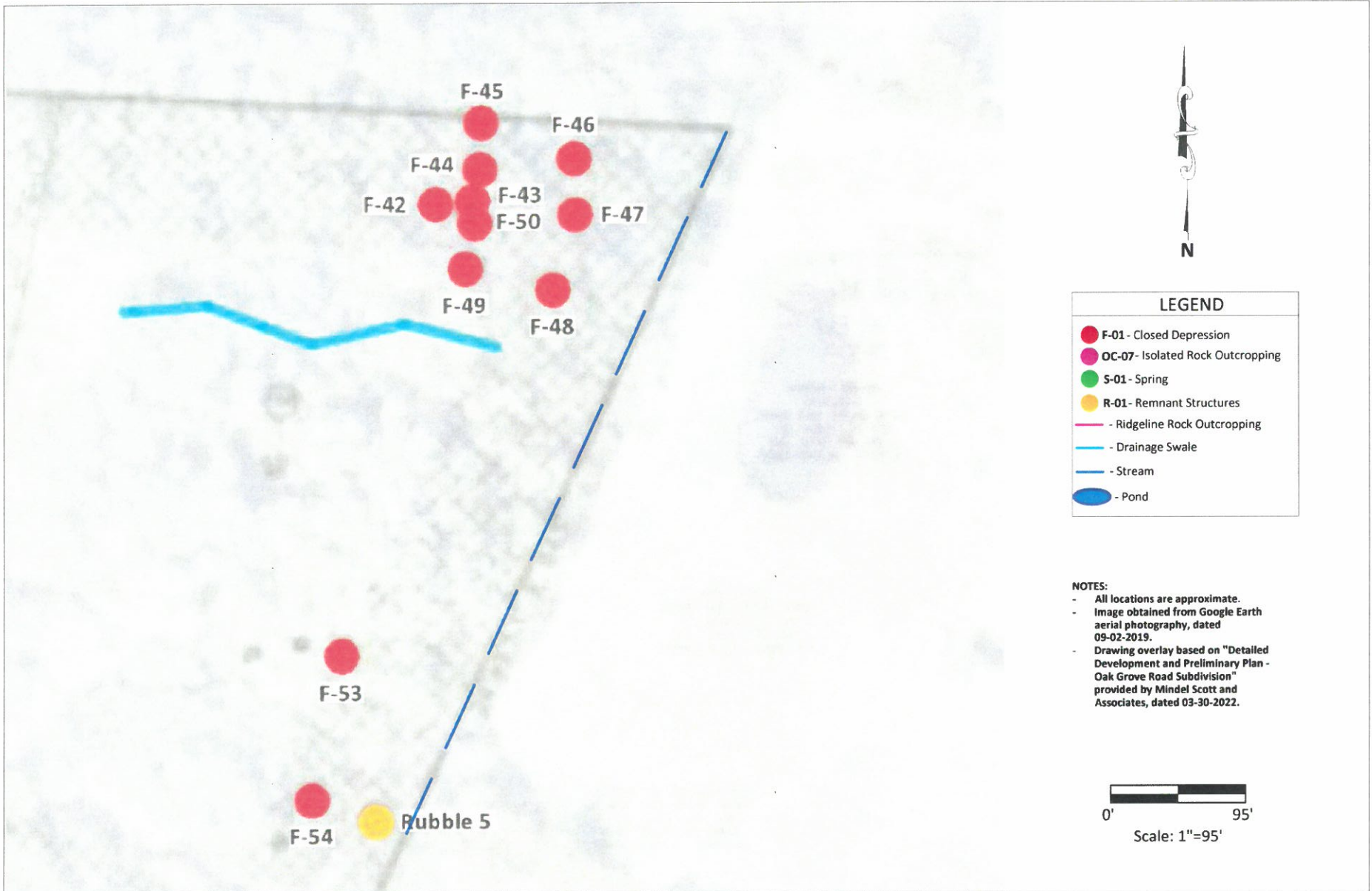












**Feature Location Plan - Northern Detail**  
 Oak Grove Subdivision - Karst Survey  
 10212 & 10302 Oak Grove Road  
 Louisville, Jefferson County, Kentucky, 40291

Project No.: 61-2724

Drawn By: BCE

Drawing No.: FLP

Checked By: FEN

Date: 05/04/2022

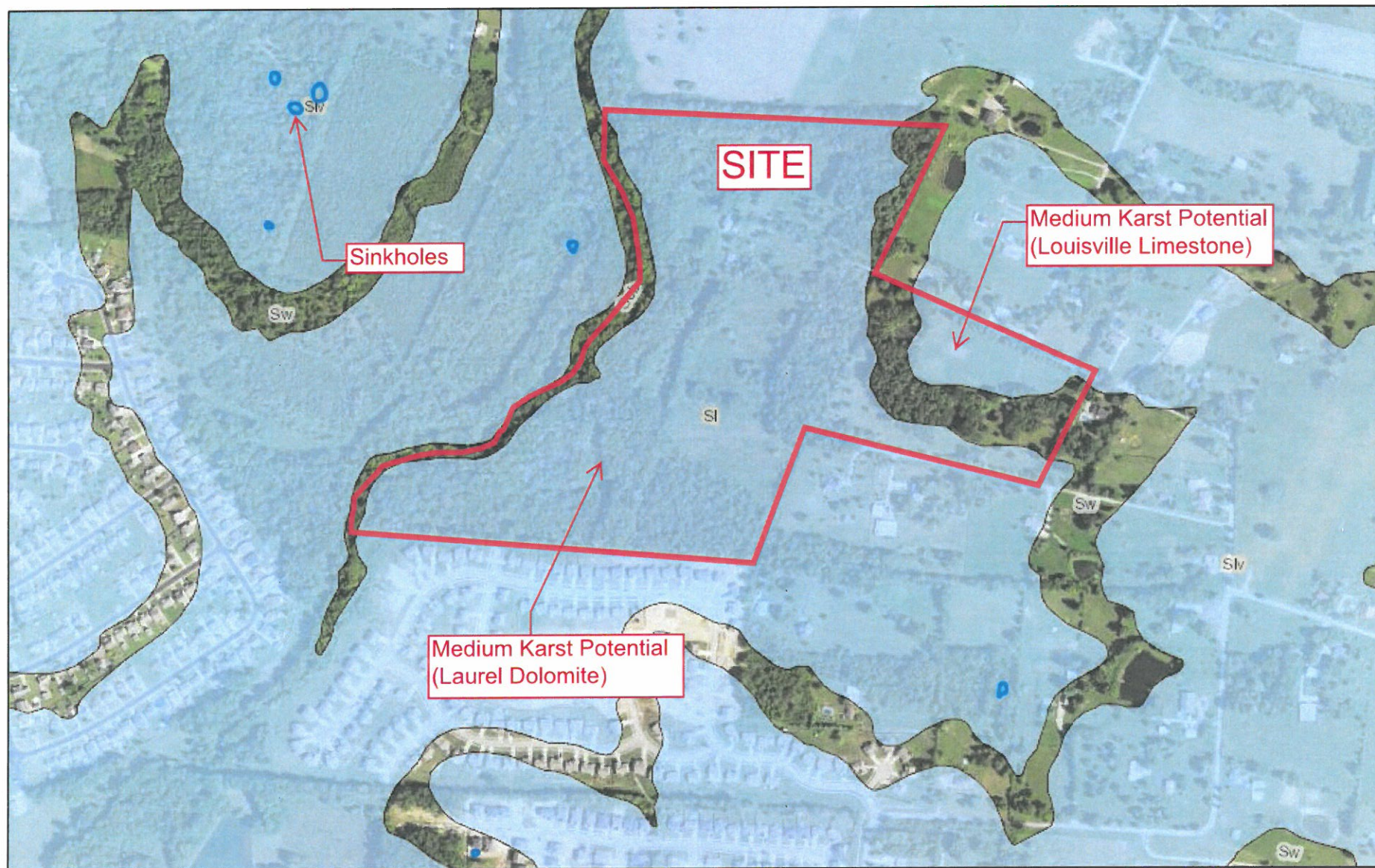
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ECS Southeast, LLP  
 1762 Watterson Trail  
 Louisville, Kentucky 40299  
 Tel. (502) 493-7100

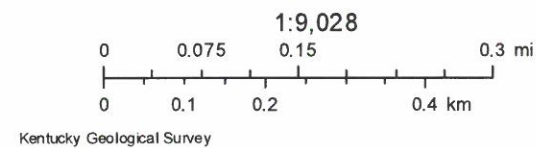
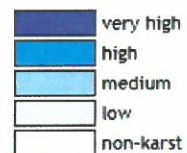


## 61-2724: Oak Grove Subdivision Karst Survey - KGS Karst Potential Map



### LEGEND

#### Karst Potential Units





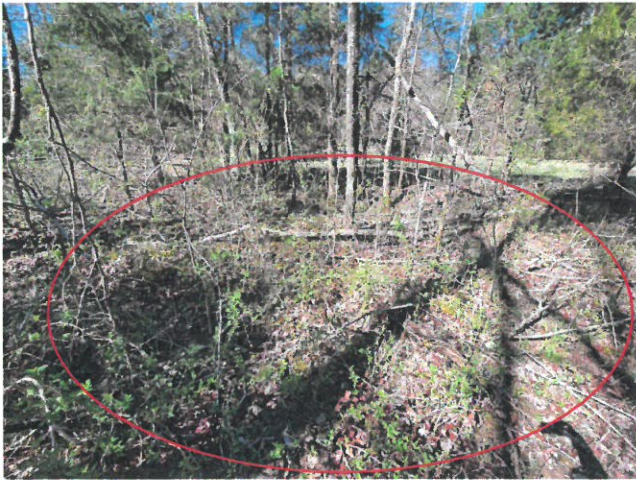


Photo 1 – View of F-1.



Photo 2 – View of F-2.



Photo 3 – View of F-3.



Photo 4 – View of F-4.



Photo 5 – View of F-5.



Photo 6 – View of F-6.

Site Photos  
ECS Project No. 61-2724



**Oak Grove Road Subdivision - Karst Survey**  
10212 & 10302 Oak Grove Road  
Louisville, Jefferson County, Kentucky 40291





Photo 7 – View of F-8



Photo 8 – View of F-9



Photo 9 – View of F-10



Photo 10 – View of F-11

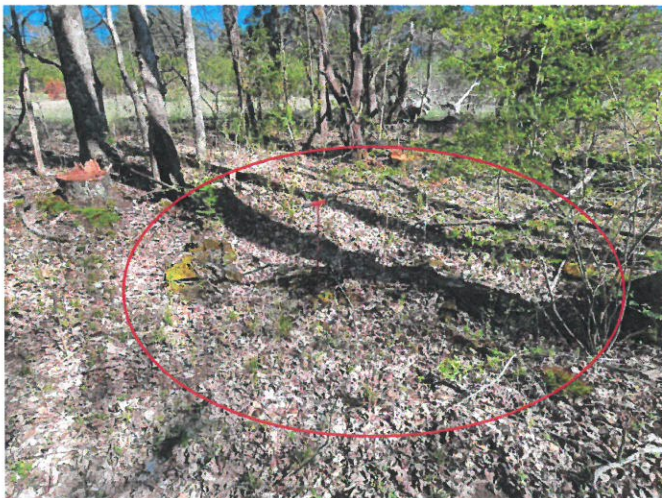


Photo 11 – View of F-12

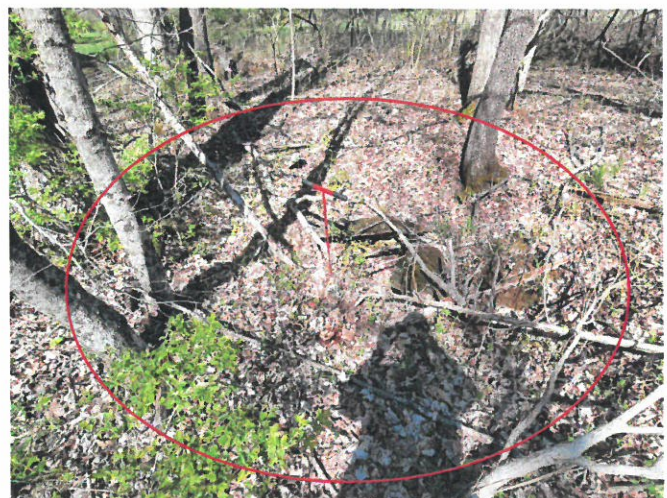


Photo 12 – View of F-13

Site Photos  
ECS Project No. 61-2724



**Oak Grove Road Subdivision - Karst Survey**  
10212 & 10302 Oak Grove Road  
Louisville, Jefferson County, Kentucky 40291





Photo 13 – View of F-14



Photo 14 – View of F-15



Photo 15 – View of F-16



Photo 16 – View of F-18



Photo 17 – View of F-19



Photo 18 – View of F-20

Site Photos  
ECS Project No. 61-2724



**Oak Grove Road Subdivision - Karst Survey**  
10212 & 10302 Oak Grove Road  
Louisville, Jefferson County, Kentucky 40291





Photo 19 – View of F-21



Photo 20 – View of F-22

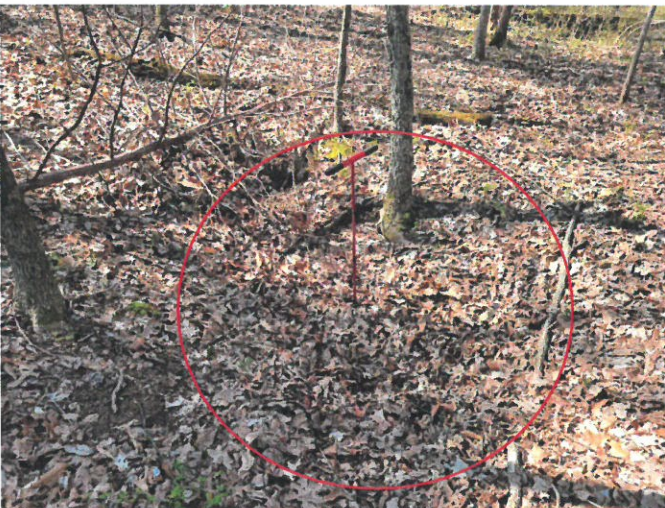


Photo 21 – View of F-23

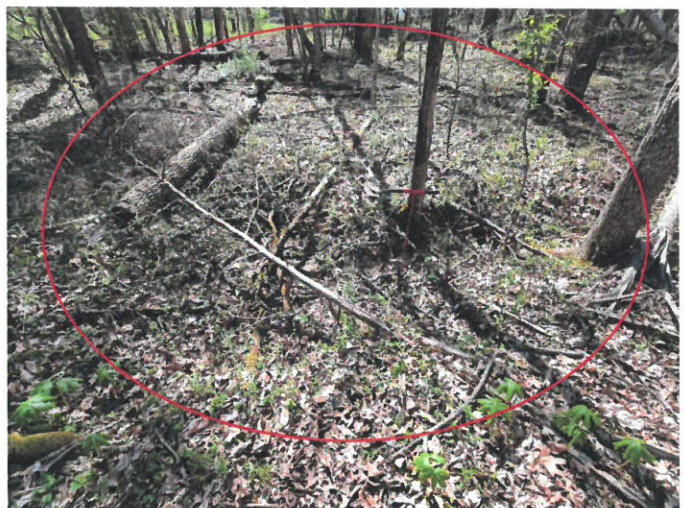


Photo 22 – View of F-24



Photo 23 – View of F-24A



Photo 24 – View of F-24B

Site Photos  
ECS Project No. 61-2724



**Oak Grove Road Subdivision - Karst Survey**  
10212 & 10302 Oak Grove Road  
Louisville, Jefferson County, Kentucky 40291





Photo 25 – View of F-25



Photo 26 – View of F-26

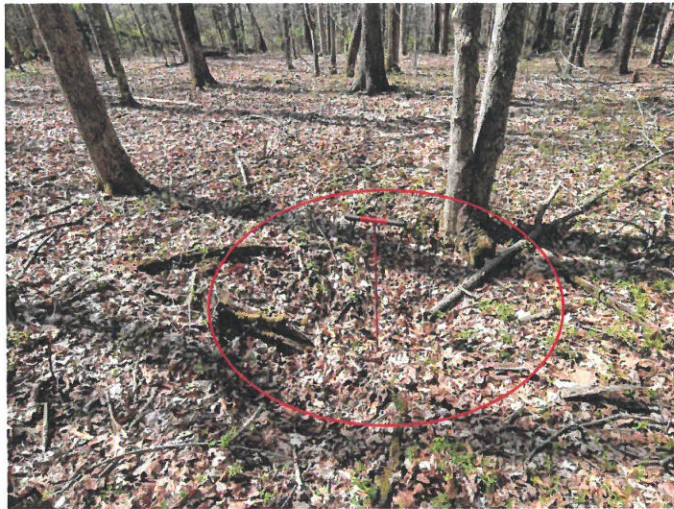


Photo 27 – View of F-27

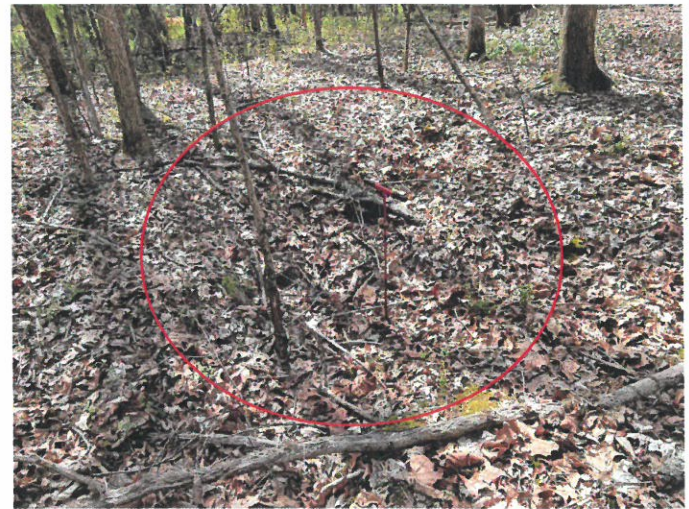


Photo 28 – View of F-28

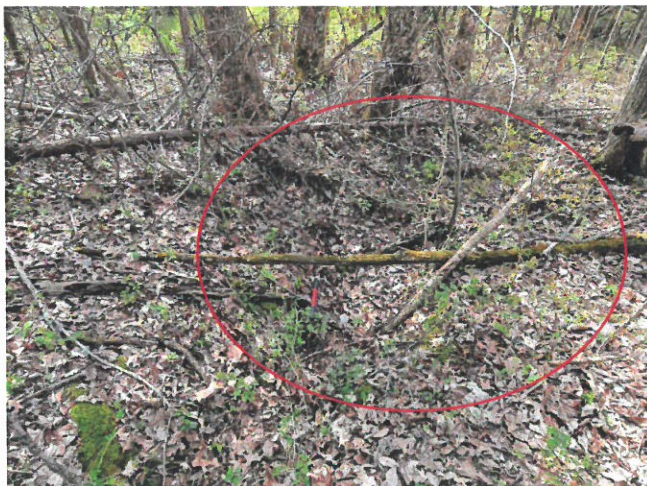


Photo 29 – View of F-29

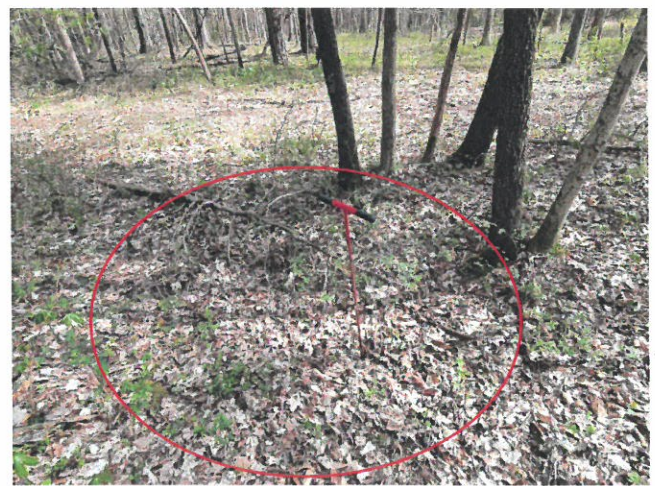


Photo 30 – View of F-30

Site Photos  
ECS Project No. 61-2724



**Oak Grove Road Subdivision - Karst Survey**  
10212 & 10302 Oak Grove Road  
Louisville, Jefferson County, Kentucky 40291





Photo 31 – View of F-31

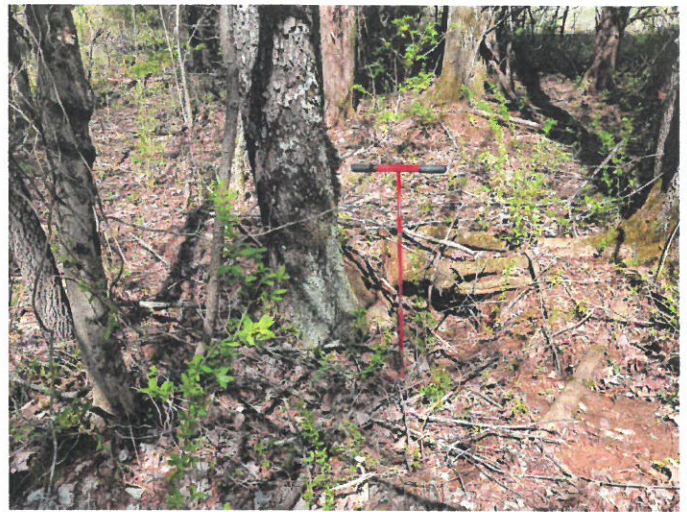


Photo 32 – View of F-32

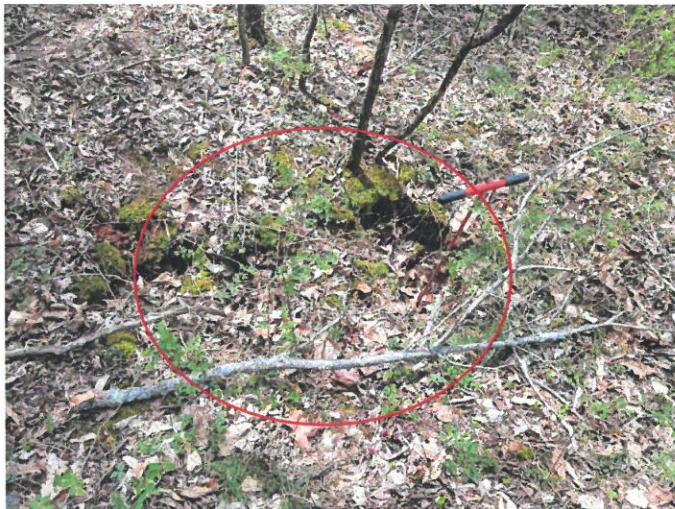


Photo 33 – View of F-33

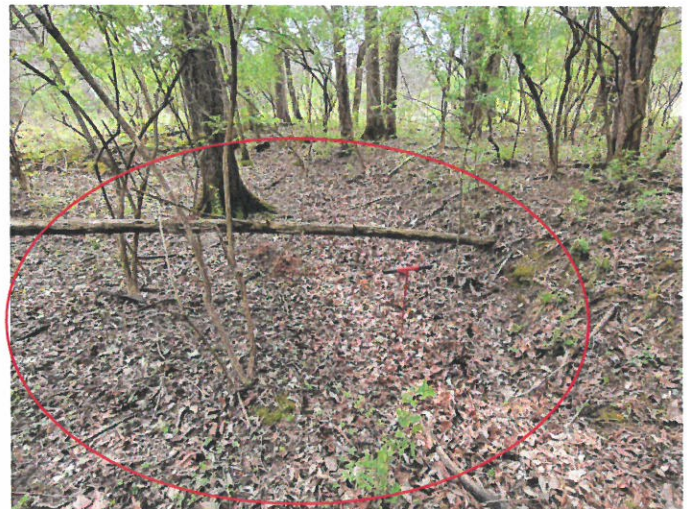


Photo 34 – View of F-34



Photo 35 – View of F-35



Photo 36 – View of F-36

Site Photos  
ECS Project No. 61-2724



**Oak Grove Road Subdivision - Karst Survey**  
10212 & 10302 Oak Grove Road  
Louisville, Jefferson County, Kentucky 40291





Photo 37 – View of F-37



Photo 38 – View of F-38



Photo 39 – View of F-39



Photo 40 – View of F-40



Photo 41 – View of F-41



Photo 42 – View of F-42

Site Photos  
ECS Project No. 61-2724



**Oak Grove Road Subdivision - Karst Survey**  
10212 & 10302 Oak Grove Road  
Louisville, Jefferson County, Kentucky 40291



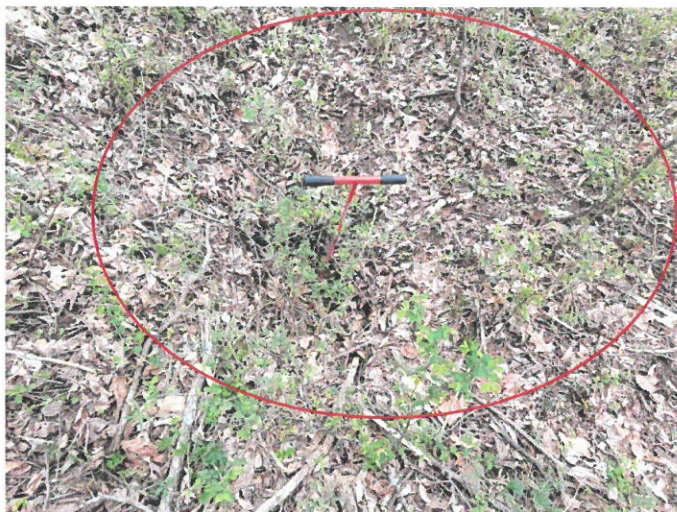


Photo 43 – View of F-43



Photo 44 – View of F-44

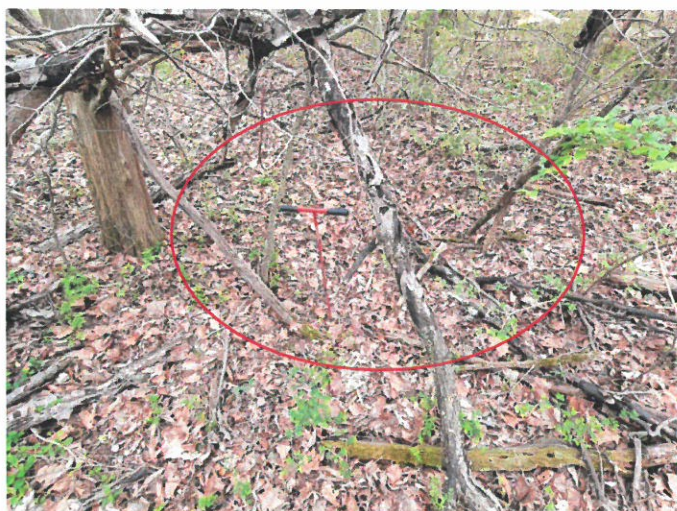


Photo 45 – View of F-45



Photo 46 – View of F-46



Photo 47 – View of F-47



Photo 48 – View of F-48

Site Photos  
ECS Project No. 61-2724



**Oak Grove Road Subdivision - Karst Survey**  
10212 & 10302 Oak Grove Road  
Louisville, Jefferson County, Kentucky 40291



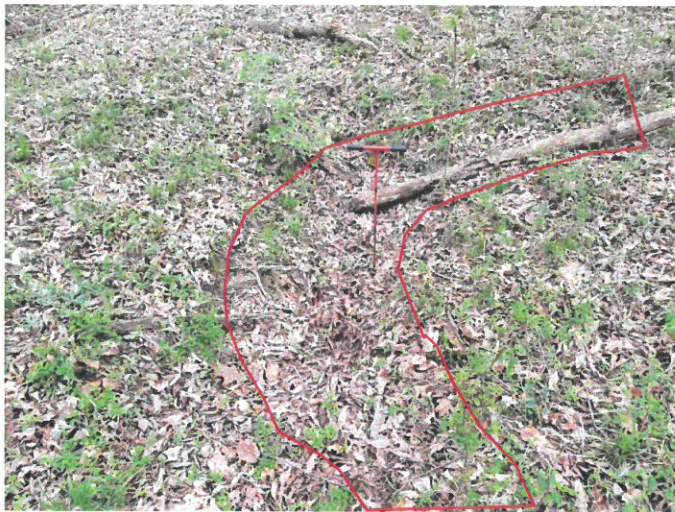


Photo 49 – View of F-49



Photo 50 – View of F-50



Photo 51 – View of F-51



Photo 52 – View of F-52



Photo 53 – View of F-53



Photo 54 – View of F-54

Site Photos  
ECS Project No. 61-2724



**Oak Grove Road Subdivision - Karst Survey**  
10212 & 10302 Oak Grove Road  
Louisville, Jefferson County, Kentucky 40291





Photo 55 – View of remnant foundation



Photo 56 – View of remnant house



Photo 57 – View of remnant shed



Photo 58 – View of remnant well



Photo 59 – View of typical rubble pile



Photo 60 – View of outcropping near remnant structures

Site Photos  
ECS Project No. 61-2724



**Oak Grove Road Subdivision - Karst Survey**  
10212 & 10302 Oak Grove Road  
Louisville, Jefferson County, Kentucky 40291





Photo 61 – View of eastern outcropping



Photo 62 – View of outcropping along Cedar Creek



Photo 63 – View of stream



Photo 64 – View of Pond 1



Photo 65 – View of Pond 2

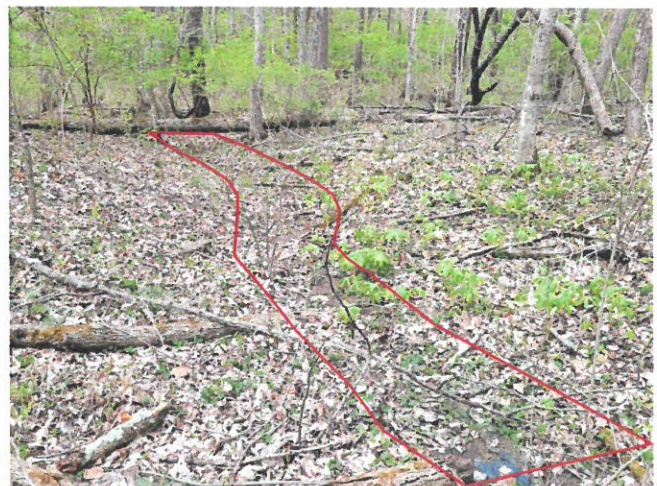


Photo 66 – View of western drainage swale

Site Photos  
ECS Project No. 61-2724



**Oak Grove Road Subdivision - Karst Survey**  
10212 & 10302 Oak Grove Road  
Louisville, Jefferson County, Kentucky 40291



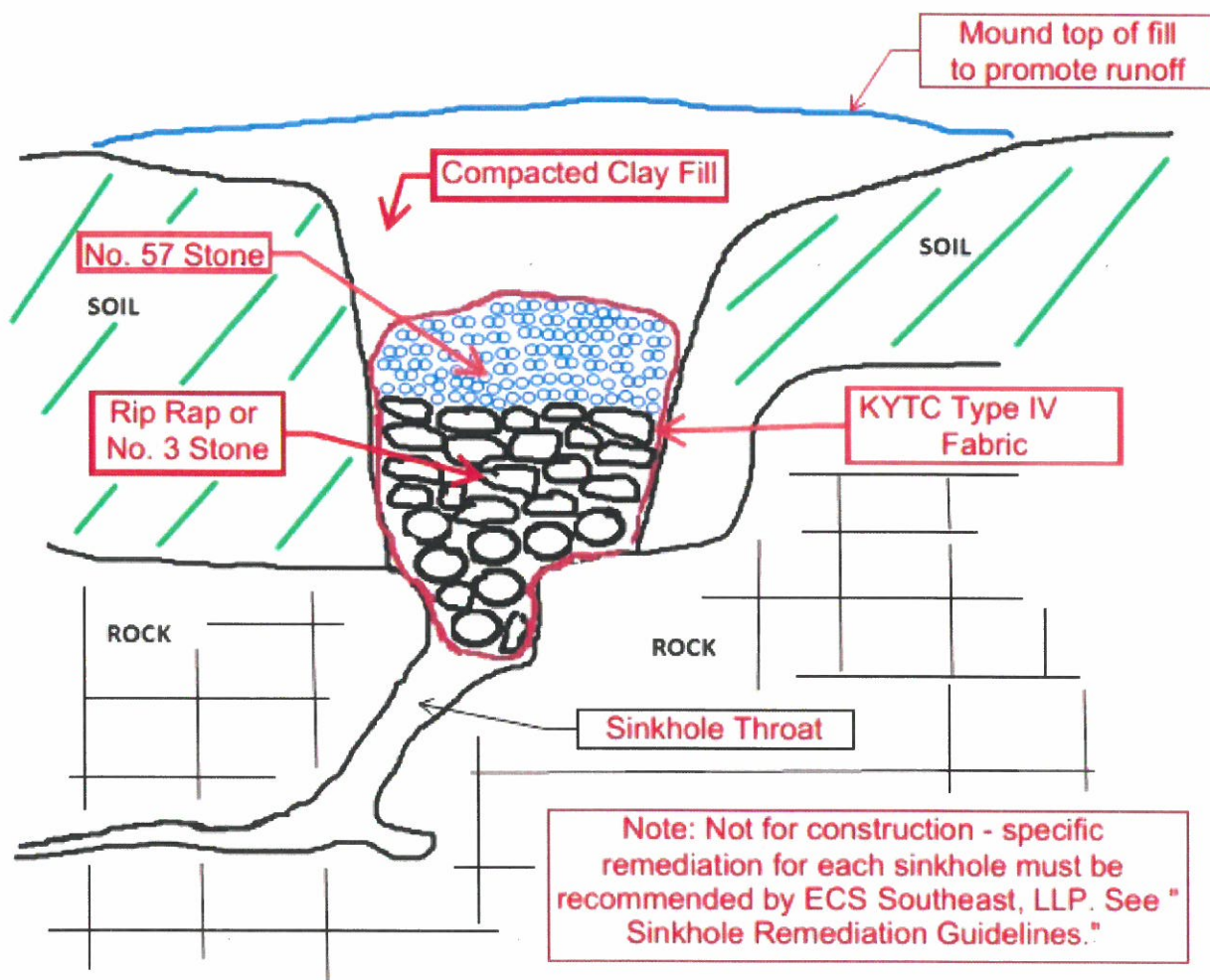


**ECS SOUTHEAST, LLP**

Geotechnical • Construction Materials • Environmental • Facilities

*"Setting the Standard for Service"*

**SINKHOLE REMEDIATION SECTION (Typical)**





DOCKET NO. 21-ZONE-0059  
ZONE CHANGE FROM RR TO R-4  
AND A LDC 4.7.7 DENSITY  
TRANSFER SUBDIVISION TO ALLOW  
A 263-LOT SINGLE FAMILY  
SUBDIVISION ON PROPERTY  
LOCATED AT 10212 AND 10302  
OAK GROVE ROAD

Louisville Metro Planning  
Commission Public Hearing  
December 16, 2021

Louisville Metro Land Development &  
Transportation Committee  
November 11, 2021

Neighborhood Meeting  
April 19, 2021

Attorneys: Bardenwerper  
Talbot & Roberts, PLLC  
Land Planners, Landscape  
Architects & Engineers:  
Mindel Scott & Associates,  
Inc.



# INDEX

1. LOJIC Zoning Map
2. Aerial photographs of the site and surrounding area
3. Ground level photographs of the site and surrounding area
4. Neighborhood Meeting notice list map, letter to neighbors inviting them to the meeting and summary of meeting
5. Development Plan
6. Waivers
7. Proposed additional binding elements
8. Traffic Study
9. Statement of Compliance filed with the original zone change application with all applicable Goals of the 2040 Plan and Waiver Justification
10. Proposed findings of fact pertaining to compliance with the 2040 Plan and Waiver criteria

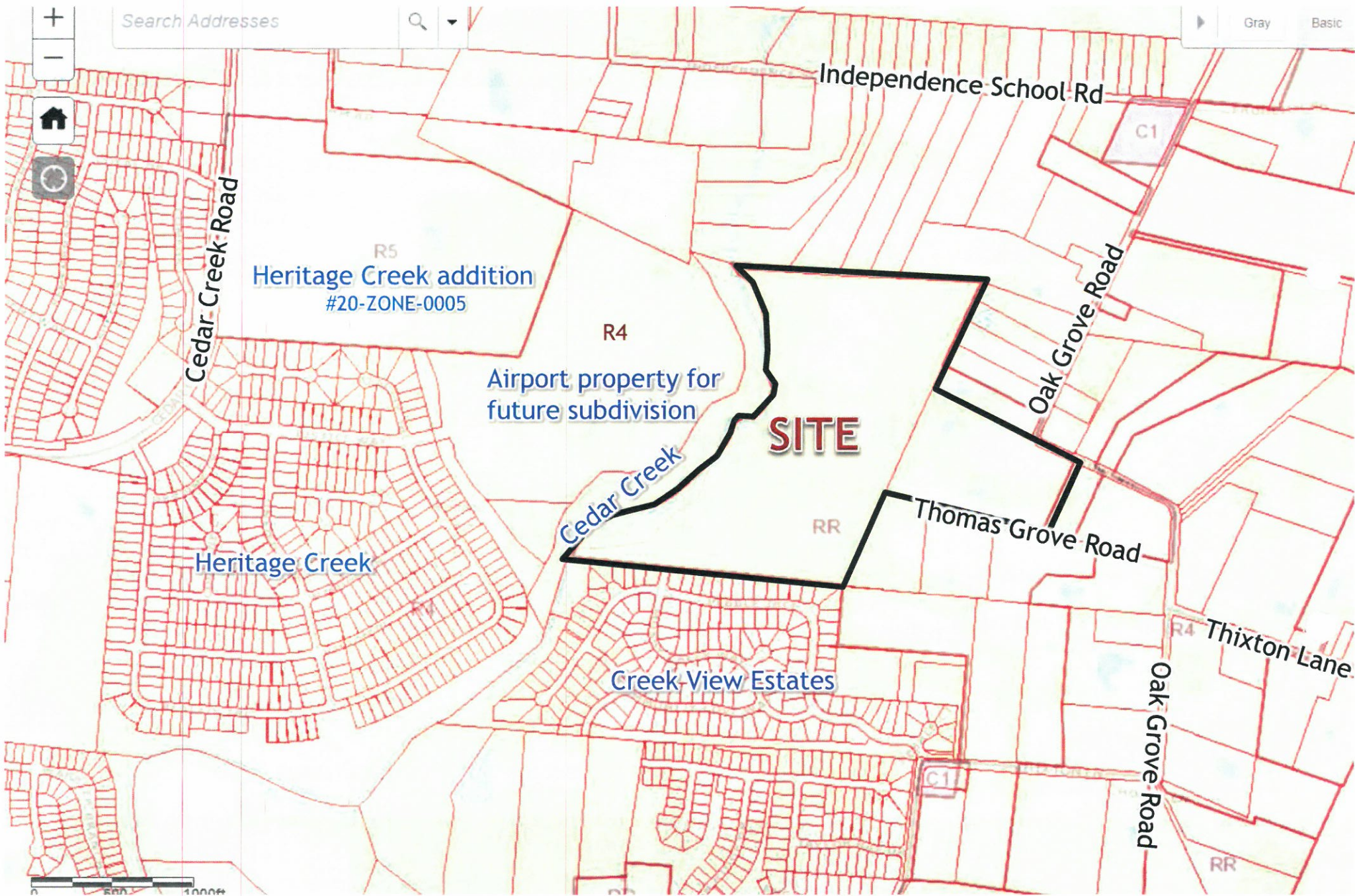




**TAB 1**  
**LOJIC ZONING MAP**







Search Addresses



Gray

Basic

Independence School Rd

C1

Cedar Creek Road

R5

Heritage Creek addition  
#20-ZONE-0005

R4

Airport property for  
future subdivision

**SITE**

Cedar Creek

RR

Oak Grove Road

Thomas Grove Road

Heritage Creek

Creek View Estates

R4

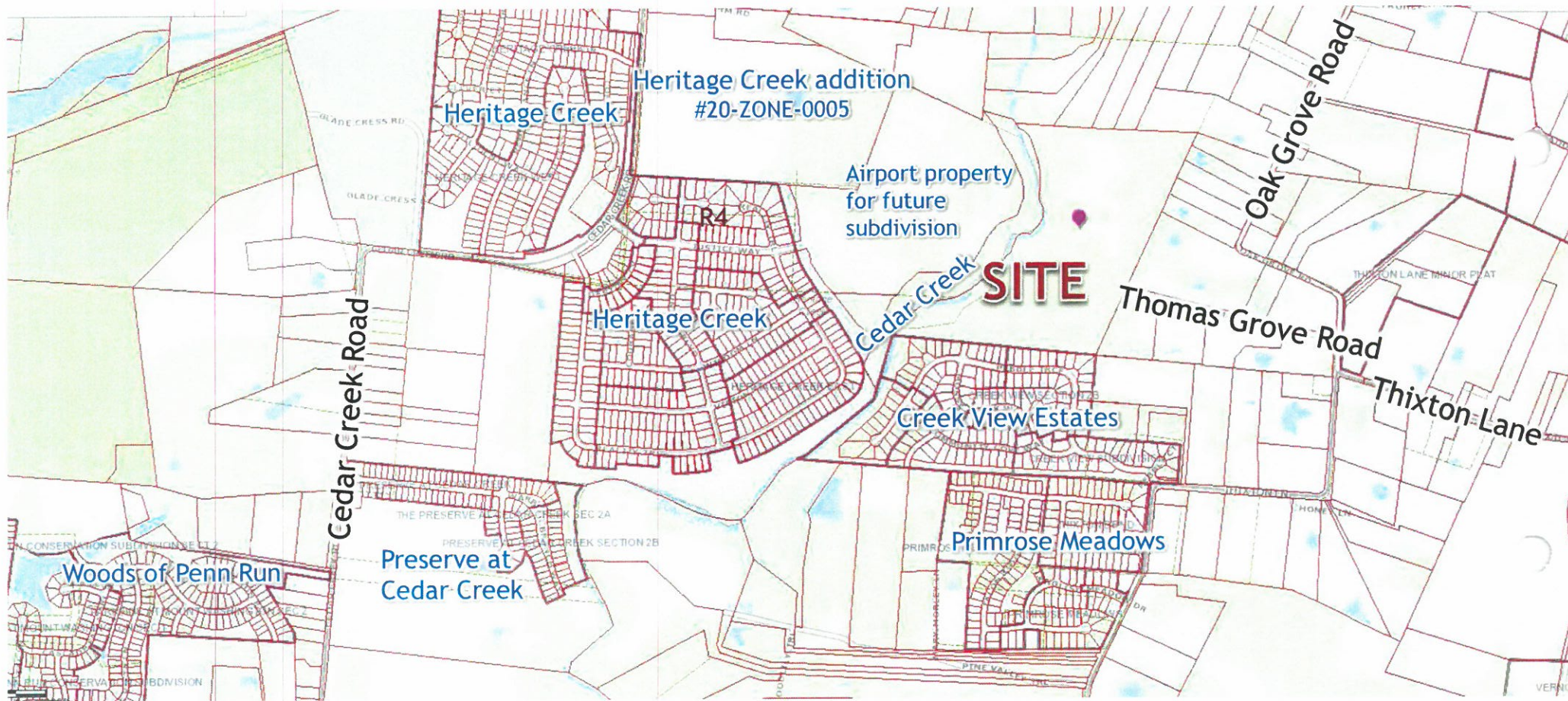
Thixton Lane

Oak Grove Road

RR

0 500 1000ft









**TAB 2**  
**AERIAL PHOTOGRAPH**  
**OF THE SITE AND**  
**SURROUNDING AREA**





Heritage Creek addition  
#20-ZONE-0005

Airport property  
for future  
subdivision

Heritage Creek

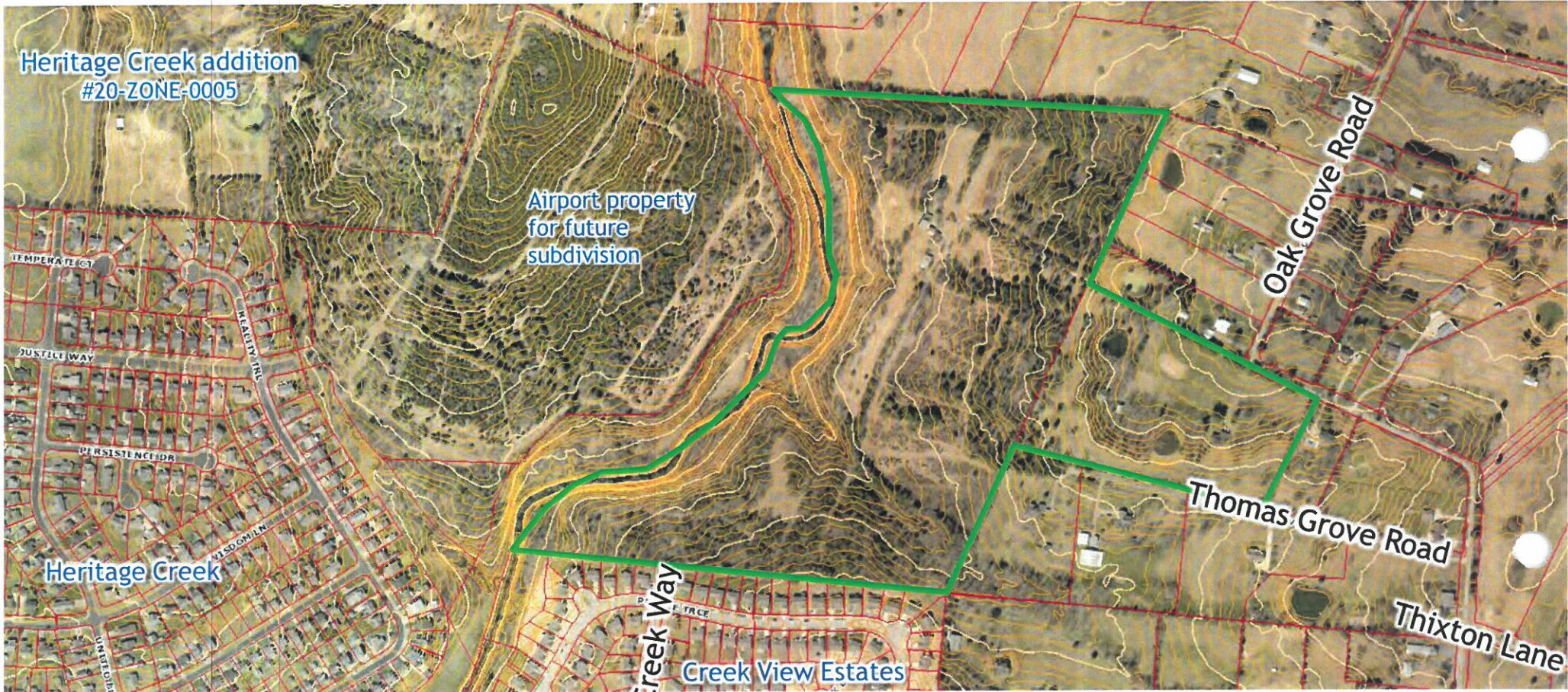
Creek View Estates

Mossy Creek Way

Oak Grove Road

Thomas Grove Road

Thixton Lane







**TAB 3**  
**GROUND LEVEL**  
**PHOTOGRAPHS OF**  
**THE SITE AND**  
**SURROUNDING AREA**







View of site from Oak Grove Road, looking south toward 90° bend, where proposed subdivision entrance will be located.





View Oak Grove Road looking west toward 90° bend. Site is to the left.





View Oak Grove Road at Thomas Grove Road





View site from Mossy Creek Way



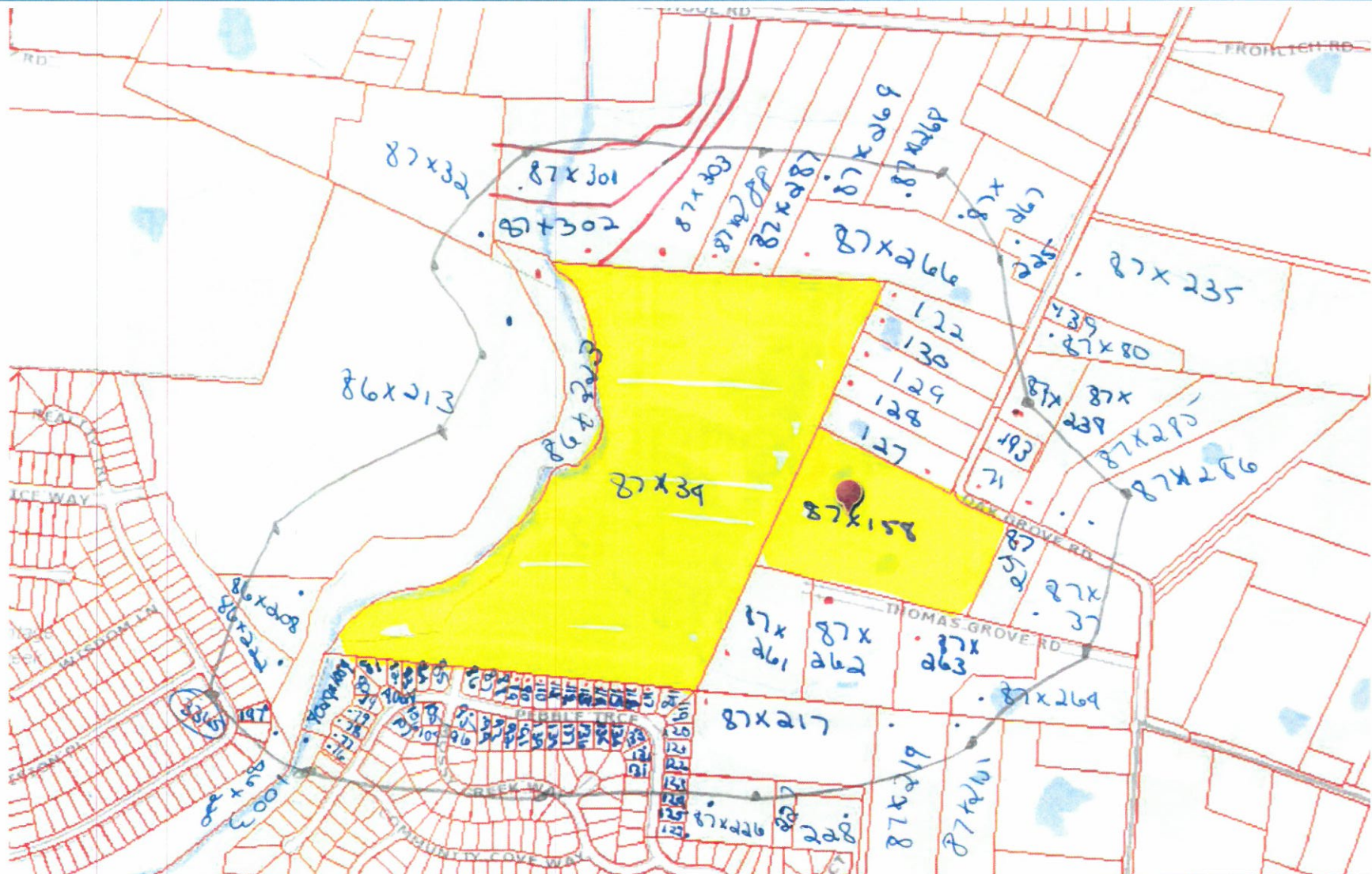


**TAB 4  
NEIGHBORHOOD MEETING  
NOTICE LIST MAP, LETTER  
TO NEIGHBORS INVITING  
THEM TO THE MEETING AND  
SUMMARY OF MEETING**





ADJOINING PROPERTY OWNER NOTICE LIST MAP WHEREIN 104 NEIGHBORS PLUS THOSE ON THE DPDS "INTERESTED PARTY LIST" WERE INVITED TO THE NEIGHBORHOOD MEETING AND SUBSEQUENT LD&T AND PLANNING COMMISSION PUBLIC HEARING.





# BARDENWERPER, TALBOTT & ROBERTS, PLLC

ATTORNEYS AT LAW

BUILDING INDUSTRY ASSOCIATION OF GREATER LOUISVILLE BLDG • 1000 N. HURSTBOURNE PARKWAY • SECOND FLOOR • LOUISVILLE, KENTUCKY 40223  
(502) 426-6688 • WWW.BARDLAW.NET

Nicholas R. Pregliasco  
Email: [NRP@BARDLAW.NET](mailto:NRP@BARDLAW.NET)  
Mobile: (502) 777-8831

April 5, 2021

RE: Neighborhood meeting for a proposed residential subdivision comprising of 290 single-family lots through a zone change request from R4 & RR to PRD on property located on the west side of Oak Grove Road at 10212 and 10302 Oak Grove Road

Dear Neighbor:

We are writing to notify you about an upcoming "neighborhood meeting" regarding the above referenced project. Because of the COVID-19 emergency orders requiring and/or recommending social distancing, the neighborhood meeting will be held virtually. The details are set forth in this letter and the supporting attachments. If you cannot obtain access to the virtual meeting, we may be able to assist you in that regard or otherwise assure a telephone or in-person conversation.

John Schutte with JS Acquisitions, LLC is seeking approval of a preliminary subdivision plat and detailed district development plan and corresponding rezoning from R4 & RR to PRD on the property referenced above. The project is proposed to consist of 290 single-family lots on approximately 68.57 acres. As such, a plan was filed for pre-application review with Metro Planning and Design Services (PDS) that was assigned case number **21-ZONEPA-0036** and case manager **Dante St. Germain**.

The virtual meeting will be held on **Monday, April 19<sup>th</sup>** beginning at **6:00 p.m.**

Enclosed for your review are the following:

1. The development plan and aerial photograph sheet
2. LOJIC site location zoning map sheet showing the location of the site
3. Detailed summary sheet of the project
4. Contact information sheet
5. Instruction sheet on how to join the virtual meeting.
6. Information sheet on how to obtain case information online from PDS' online customer service portal.
7. PDS' "After the Neighborhood Meeting" sheet

If you are unable to attend the virtual meeting, or have any questions or comments, please feel free to email or call me, or contact the PDS manager listed on the attached contact information sheet.

We look forward to our opportunity to visit virtually or by phone.

Sincerely,

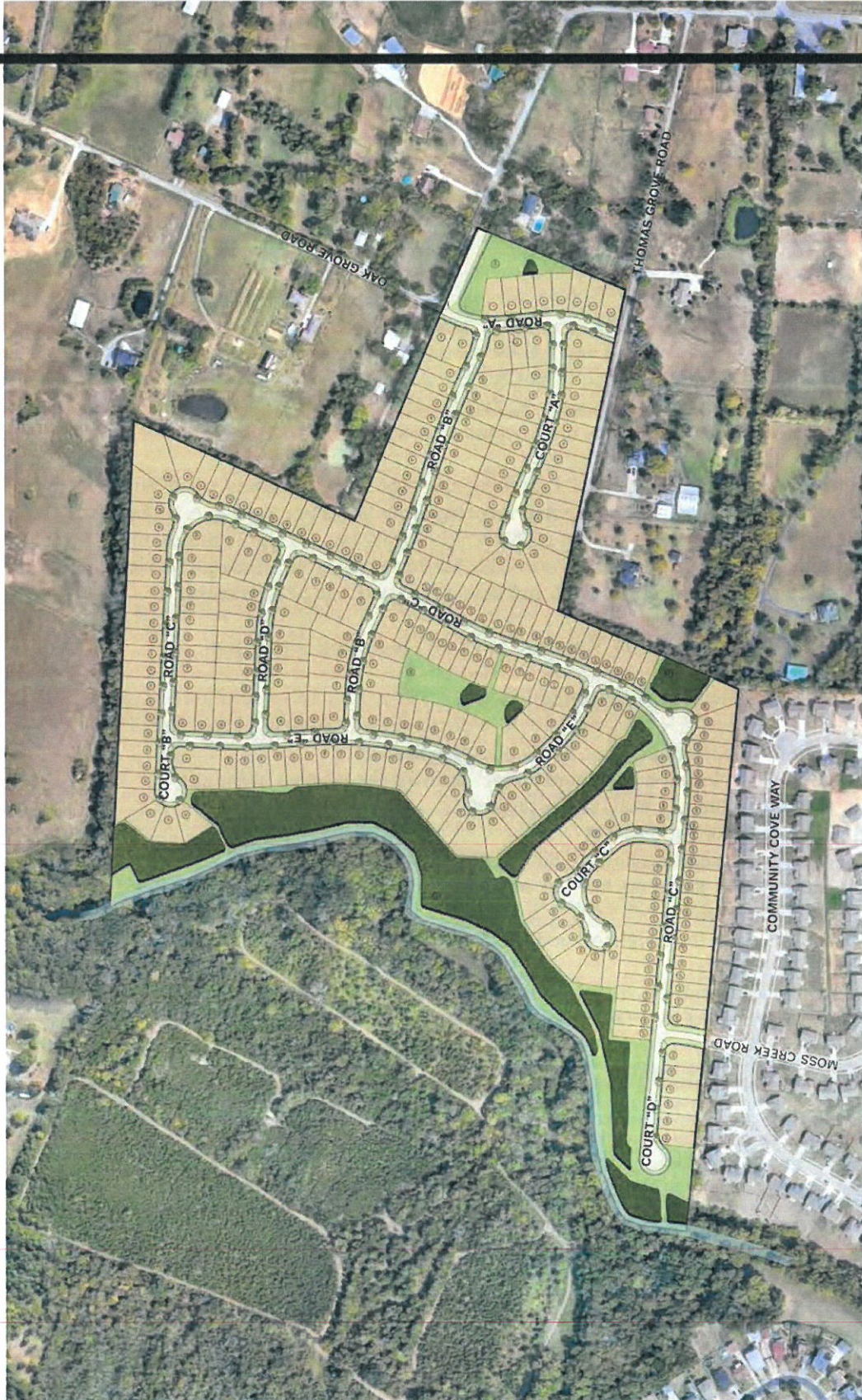


Nicholas R. Pregliasco

cc: Hon. Robin Engel, Councilman, District 22  
Dante St. Germain, Planning & Design Case Manager  
David Mindel & Kathy Linares, land planner with Mindel Scott & Associates, Inc.  
John Schutte, applicant with JS Acquisitions, LLC

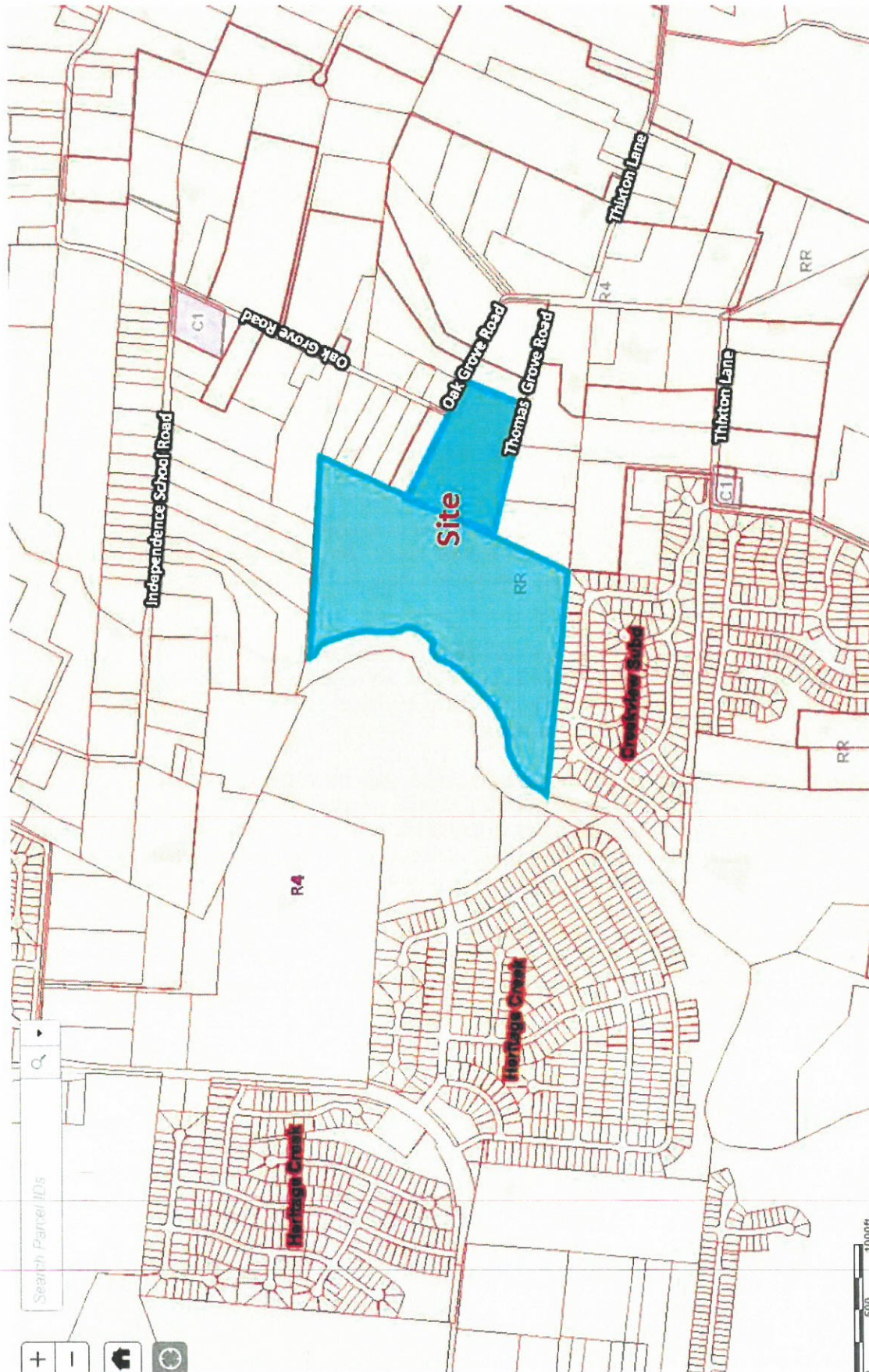


# DEVELOPMENT PLAN





# LOJIC SITE LOCATION SHEET





## **DETAILED SUMMARY SHEET**

John Schutte with JS Acquisitions, LLC is seeking approval of a preliminary subdivision plat and detailed district development plan and corresponding rezoning from R4 & RR to PRD on the property referenced above. The project is proposed to consist of 290 single-family lots on approximately 68.57 acres. As such, a plan was filed for pre-application review with Metro Planning and Design Services (PDS) that was assigned case number 21-ZONEPA-0036 and case manager, Dante St. Germain.

The property is located on the west side of Oak Grove Road, just north of Heritage Creek subdivision, as shown on the attached "LOJIC Site Location" attachment.

Landscaping, screening and buffering will contain at least the minimum amount required by Chapter 10 of the Louisville Metro Land Development Code (LDC). Greater detail on this should be available at the time of the neighborhood meeting, which should also include details on the plan for preservation of trees and other vegetation. A tree preservation plan basically accomplishing this will be provided to the planning commission's staff landscape architect for approval prior to commencement of post-approval construction activities.

Sanitary sewer service will be connected to the Cedar Creek Wastewater Treatment Plant by lateral extension agreement.

A traffic analysis is being prepared. When completed, it will be available, like everything else pertaining to this proposed project, on the PDS customer service portal. Any roadway improvements will be determined by Metro Public Works and Transportation Planning (MPW&TP) during the formal review process.

Storm water treatment must assure that post-development rates of run-off does not exceed pre-development conditions. Detention will be compensated through regional facility fees. Final configuration of drainage pipes and channels shall be determined in the construction plan process. Drainage facilities must conform to MSD requirements.

**DEVELOPMENT PLAN CHANGES.** Please be advised that this "Detailed Summary" is being provided early in the application process. As such, whereas every effort has been made to assure accuracy, changes may be made to the subdivision/development plan before the now scheduled neighborhood meeting and also after it based on public comments and those of various agencies and PDS staff review. Any changes will be available for public review on the PDS Online Customer Service Portal. Instructions on how to access this information is provided in the PDS's online customer service portal information sheet. Additionally, those changes with the final plan would be presented at the time of the public hearing(s). You may also contact the PDS case manager if you have any questions, or contact any others listed on the Contact Information Sheet where contact information is provided.



## **CONTACT INFORMATION SHEET**

### **1. PRIMARY CONTACT**

*Bardenwerper, Talbott & Roberts, PLLC  
1000 N. Hurstbourne Pkwy., 2<sup>nd</sup> Floor  
Louisville, KY 40223  
Attn: Nick Pregliasco – (502) 777-8831  
[nrp@bardlaw.net](mailto:nrp@bardlaw.net)*

### **2. ENGINEERING FIRM**

*Mindel Scott & Associates, Inc.  
5151 Jefferson Blvd.  
Louisville, Kentucky 40219  
Attn: David Mindel or Kathy Linares – (502) 485-1508  
[dmindel@mindelscott.com](mailto:dmindel@mindelscott.com) or [klinares@mindelscott.com](mailto:klinares@mindelscott.com)*

### **3. APPLICANT**

*JS Acquisitions, LLC  
9707 Shelbyville Road  
Louisville, KY 40223  
John Schutte – [jschutte@gerimedgso.com](mailto:jschutte@gerimedgso.com)*

### **4. CASE MANAGER OR SUPERVISOR**

*Dante St. Germain, Planning & Design Case Manager  
Planning & Design Services  
444 South Fifth Street, Suite 300  
Louisville, KY 40202  
(502) 574-4388  
[Dante.St.Germain@louisvilleky.gov](mailto:Dante.St.Germain@louisvilleky.gov)*



# INSTRUCTION SHEET ON HOW TO JOIN THE VIRTUAL MEETING

You may join the meeting using a computer, tablet, smart phone, or standard telephone

Schutte/Oak Grove

Mon, Apr 19, 2021 6:00 PM - 8:00 PM (EDT)

**Please join my meeting from your computer, tablet or smartphone.**

<https://global.gotomeeting.com/join/259343197>

**You can also dial in using your phone.**

United States (Toll Free): [1 877 309 2073](tel:18773092073)

United States: [+1 \(571\) 317-3129](tel:+15713173129)

**Access Code:** 259-343-197

New to GoToMeeting? Get the app now and be ready when your first meeting starts:

<https://global.gotomeeting.com/install/259343197>

Note: If anyone would like the connection link emailed to them, or a set of the meeting slides, please email Anna Martinez at [amc@bardlaw.net](mailto:amc@bardlaw.net) or Nanci Dively at [nsd@bardlaw.net](mailto:nsd@bardlaw.net)

**IF YOU ARE UNABLE TO ATTEND THE VIRTUAL MEETING AND HAVE QUESTIONS, PLEASE FEEL FREE TO CONTACT ANY OF THE FOLLOWING:**

*Nick Pregliasco, Esq. – (502) 777-8831*

*[nrp@bardlaw.net](mailto:nrp@bardlaw.net)*

*Bardenwerper, Talbott & Roberts, PLLC*

*David Mindel or Kathy Linares – (502) 485-1508*

*[dmindel@mindelscott.com](mailto:dmindel@mindelscott.com) or [klinares@mindelscott.com](mailto:klinares@mindelscott.com)*

*Mindel Scott & Associates, Inc.*

*Dante St. Germain, Planning & Design Case Manager*

*(502) 574-4388*

*[Dante.St.Germain@louisvilleky.gov](mailto:Dante.St.Germain@louisvilleky.gov)*



**PLANNING & DESIGN SERVICES (PDS's)**  
**ONLINE CUSTOMER SERVICE PORTAL INFORMATION SHEET**

To view details of the zone change online, use the link at:

<https://aca-louisville.accela.com/LJCMG/Welcome.aspx?TabName=Home&TabList=Home>

Click on the "Search" tab

Then "Planning Applications"

Enter case number in "Record Number" box

Click on "Record Info" tab



## AFTER THE NEIGHBORHOOD MEETING SHEET

### **After the Neighborhood Meeting**

This Neighborhood Meeting is an opportunity for the applicants and surrounding neighbors to discuss and develop an understanding of the proposal prior to a public hearing. At the conclusion of this neighborhood meeting, the applicant has 90 days to file a formal application with Planning & Design Services. If the formal application is not filed within 90 days, the applicant will be required to have another neighborhood meeting.

Once the formal application is filed, a public hearing will be scheduled to consider the application. This public meeting is your official opportunity to speak in support or opposition to the proposal. If you received a notice regarding this neighborhood meeting, or did not receive a notice but signed the sign in sheet, you will receive a notice of the public meeting. Please contact the case manager if you are interested in learning how to request a night hearing or hearing in the district of the project.

If you are interested in staying informed about this proposal, or have any questions about the formal review process, you may call the Planning & Design Services office at **(502) 574-6230**. Please refer to the case number in your inquiry. You may also go to **<https://louisvilleky.gov/government/planning-design>** to view meeting agendas, search case information, or obtain other Planning & Design Services information.



## Neighborhood Meeting Summary

A virtual neighborhood meeting was held on Monday, April 19<sup>th</sup> at 6:00 pm. Those in attendance included the applicant's representatives, Nick Pregliasco, attorney with Bardenwerper, Talbott & Roberts, and David Mindel, land planner and engineer with Mindel Scott and Associates.

Nick Pregliasco started off the virtual neighborhood meeting by showing a Power Point presentation showing the location of the property on both an aerial and LOJIC zoning map, as well as ground level photographs of the site. Nick showed the other recent subdivisions approved and constructed in the near vicinity of this site. Nick then showed the proposed PRD subdivision plan describing the open space, the entrance off Oak Grove Road and explained that the entrance off Thomas Grove Road would not be a second access point and only a stub connection would be built with the end blocked for access. Nick showed the prior downzoning of a portion of the subject property from R-4 to RR as part of a larger area wide rezoning. Nick explained that the property owner didn't fully understand the impacts of their voluntary inclusion of their property in the downzoning necessitating the current application. Nick, along with David Mindel, explained the proposed subdivision plan and the reasons for the proposed layout due to topography, etc. Nick then described the PRD zoning district and the requirements contained therein and what is allowed. He then explained the rezoning process going through each step and the anticipated timing related to the overall development. David Mindel then described more of the technical details of the subdivision plan and why the lots were laid out in the way it was as well as the potential order of development of the property. He described the stream to the west and the steep topography in that area, as well as the reason for the stub connection to the Creekview Estates subdivision. Nick showed a ground level photograph of the existing stub connection at the end of Mossy Creek Way and the signs put up at the end of the stub connection. Nick then opened the floor up for questions asking those in attendance to send a message in chat so that everyone hears the question and the answer provided.

Many of the questions raised related to concerns over additional traffic in the area and in particular along Oak Grove Road as it is currently dangerous, as well as the desire to preserve the area as a more rural area with farms. A few who use Oak Grove Road to pull farm trailers said it is currently dangerous. David explained Oak Grove Road has been reviewed and there are a few areas where the width is not the full 18' of roadway width explaining how the applicant will address same. Nick and David explained the reason for the proposed entrance off Oak Grove Road and the requirement to connect to the stub connection to the south at Mossy Creek Way. David answered questions as to the traffic on Oak Grove Road Cedar Creek Road in relation to other areas of Metro Louisville. David also explained that this application is in the early stages of the process and have not yet received agency comments from Transportation Planning and Public Works. There was significant concern about the proposed stub connection to Thomas Grove Road as it was a private access easement. Multiple persons mentioned that it was a private road and objected to a connection. Nick explained that no connection was proposed, only a stub connection to the property line and the signs that would be installed at the end of the stub to prohibit a connection. Nick explained the other recent subdivisions in the area and the prior subdivision application filed for the subject property including other property as well and how this is a smaller proposed subdivision. David Mindel answered questions as to a request for a connection across Cedar Creek to the west and the reasons same is not proposed due to the topography in the area. Those in attendance asked questions about the glade crest and other endangered species on the site currently as well as the stream. Nick and David explained that the client has engaged Redwing Ecological to evaluate the property for the presence of same. Others in attendance objected to the number of homes and the screening and buffering that will be provided between the rear of the homes and their adjacent properties. Nick and David explained the lot width, being smaller lots, and the reasons this is the lot width that almost all new subdivisions are currently due to the amount of demand for this product.



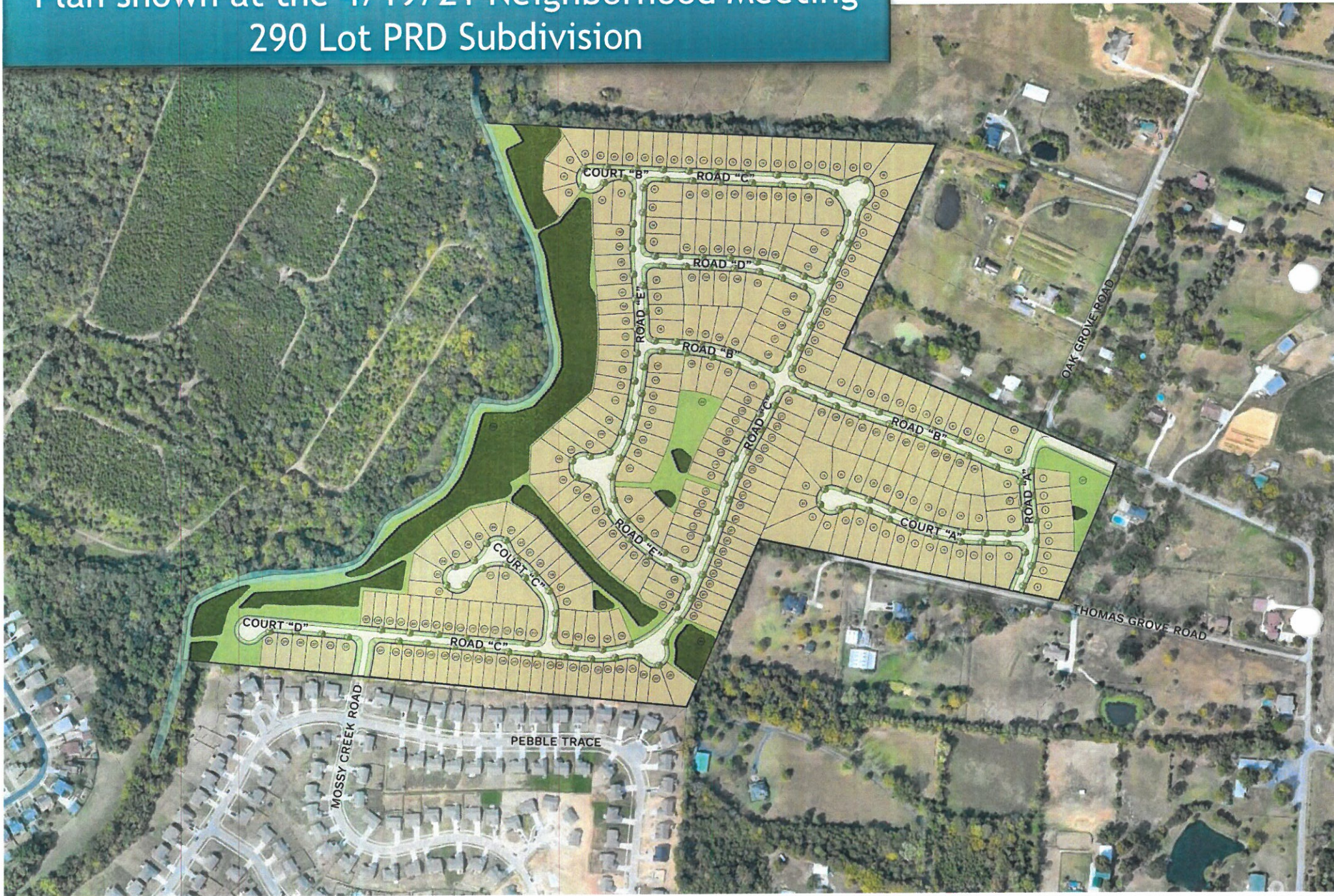


**TAB 5**  
**DEVELOPMENT PLAN**





Plan shown at the 4/19/21 Neighborhood Meeting  
290 Lot PRD Subdivision





Plan shown at the 4/19/21  
Neighborhood Meeting  
290 Lot PRD Subdivision



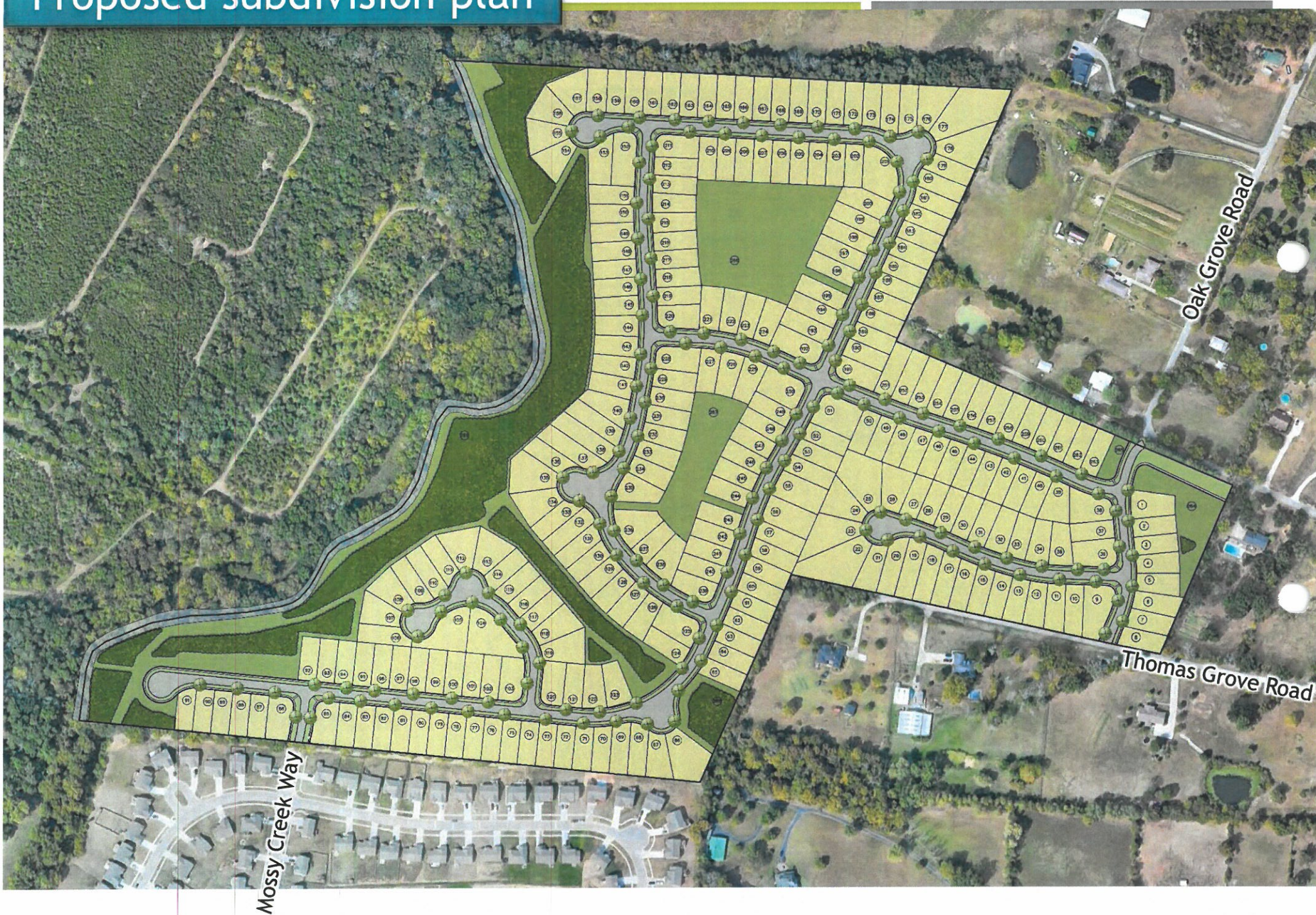
Proposed plan  
263 Lot R-4 Density Transfer  
Subdivision



Detention added



# Proposed subdivision plan





# Proposed subdivision plan





Ordinance for area-wide  
rezoning in area on 72 parcels,  
Case #9868

ORDINANCE NO. 40, SERIES 2008

AN ORDINANCE CHANGING THE ZONING FROM R-4 SINGLE-FAMILY RESIDENTIAL TO R-R RURAL RESIDENTIAL ON 732 PARCELS OF PROPERTY, AND 1011 THIXTON LANE (TAX BLOCK 0087 LOT 0243 SUB LOT 0000) SHALL REMAIN R-4 SINGLE-FAMILY RESIDENTIAL, AS IDENTIFIED FURTHER IN THE ATTACHED LEGAL DESCRIPTIONS, LOCATED IN THE THIXTON LANE AREA, CONTAINING 466.03 461.10 ACRES AND BEING IN LOUISVILLE METRO (CASE NO. 9868) (AS AMENDED)

SPONSORED BY: COUNCILMAN TOM OWEN

WHEREAS, the Legislative Council of the Louisville/Jefferson County Metro Government (the "Council") has considered the evidence presented at the public hearing held by the Louisville Metro Planning Commission and the recommendations of the Commission and its staff as set out in the minutes and records of the Planning Commission in Case No. 9868; and

WHEREAS, the Council concurs in and adopts the findings of the Planning Commission for the zoning changes in Case No. 9868 and approves and accepts the recommendations of the Planning Commission as set out in said minutes and records;

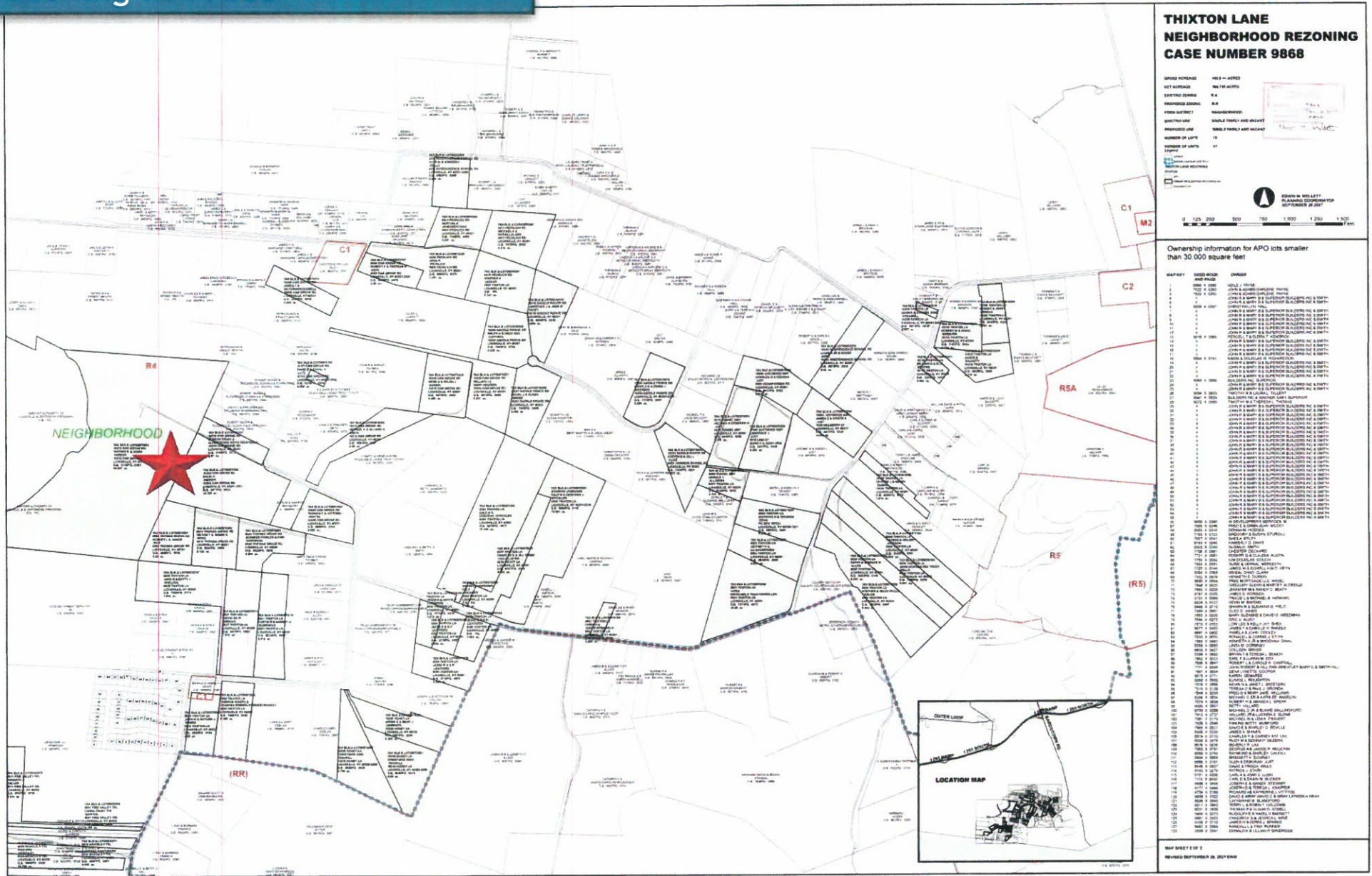
**NOW THEREFORE BE IT ORDAINED BY THE LEGISLATIVE COUNCIL OF THE LOUISVILLE/JEFFERSON COUNTY METRO GOVERNMENT AS FOLLOWS:**

**Section I:** That the properties located in the Thixton Lane Rezoning Area, as that term is defined in the minutes and records of the Planning Commission in Case No. 9868, containing 466.03 461.10 acres and being in Louisville Metro, more particularly described in said minutes and records, are hereby rezoned from R-4 Single Family

000467



# Properties within the area-wide rezoning in #9868



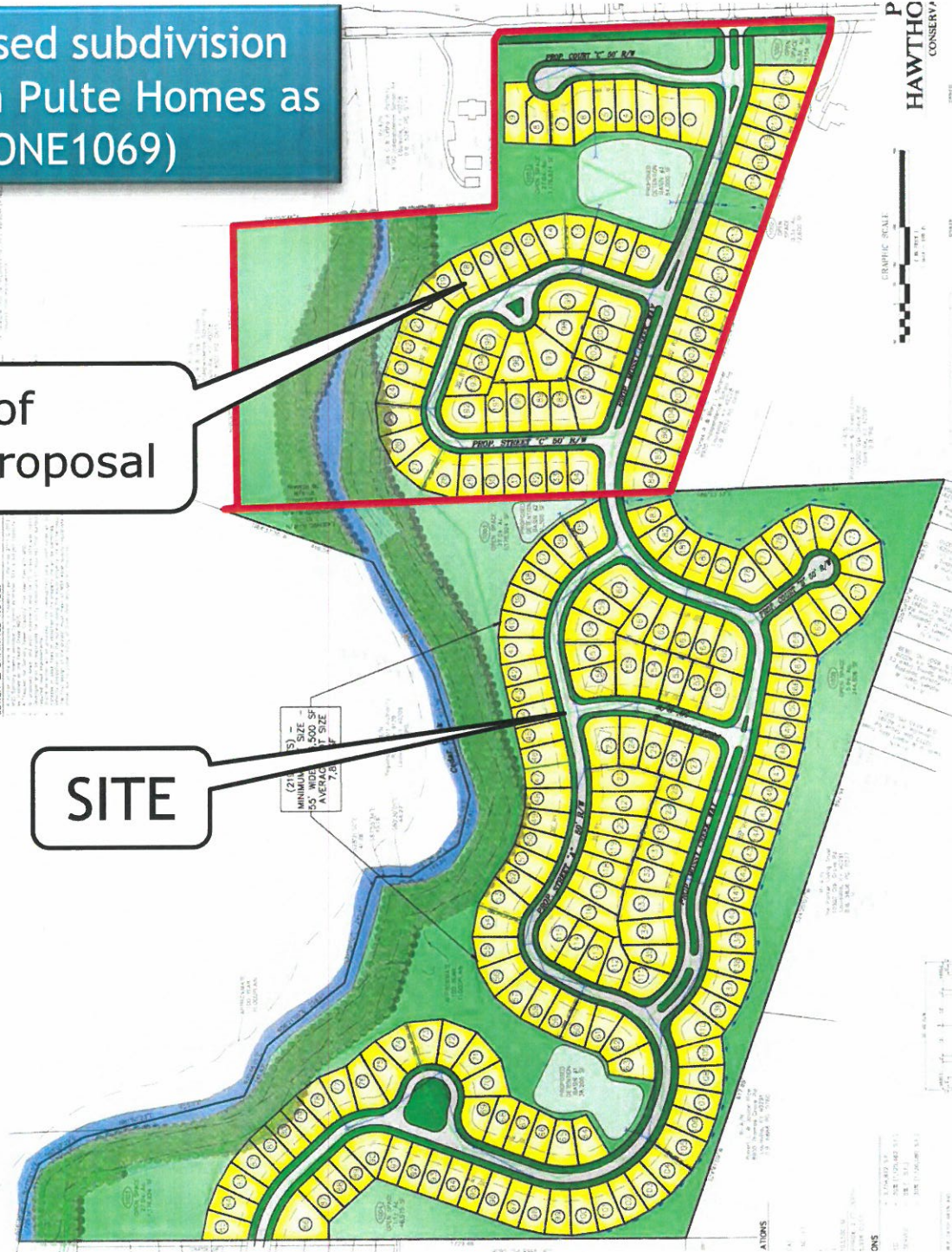


Previously proposed subdivision plan on site from Pulte Homes as developer (#15ZONE1069)

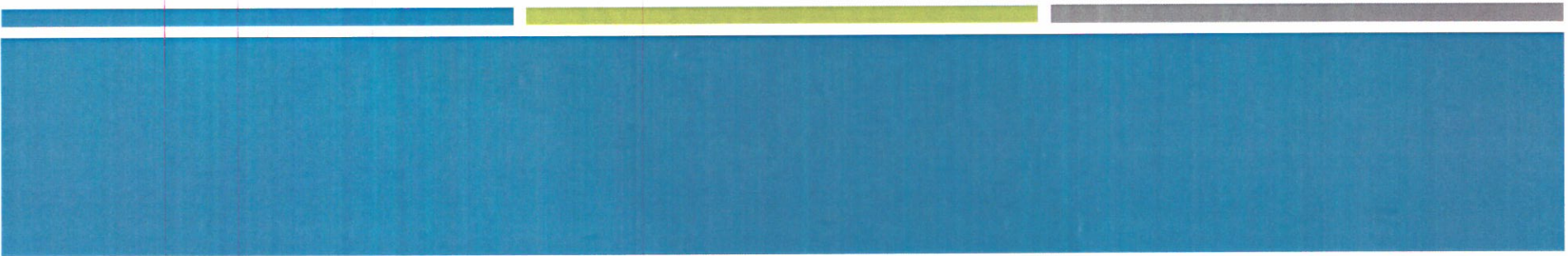
Not part of current proposal

SITE

(218)  
MINIMUM  
SIZE  
OF  
LOT  
7.8







# TAB 6 WAIVERS



# Waiver from LDC 5.9.2.A.1.a.ii to omit required stub connection

Areas of stub  
connection waiver

Mossy Creek Way

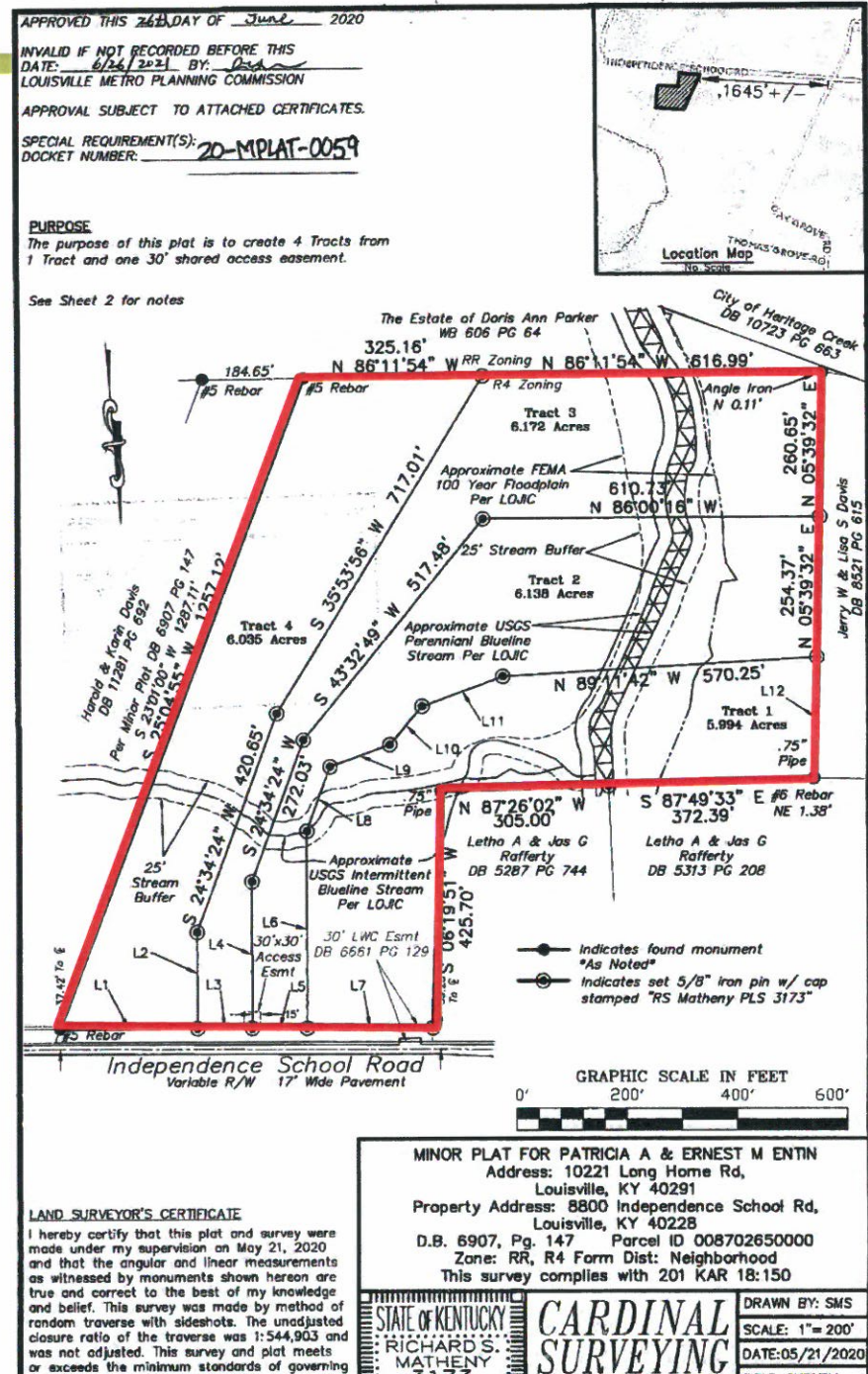
Oak Grove Road

Thomas Grove Road





## DEED Book 11725 Page 472



MINOR PLAT FOR PATRICIA A & ERNEST M ENTIN  
Address: 10221 Long Home Rd,  
Louisville, KY 40291  
Property Address: 8800 Independence School Rd,  
Louisville, KY 40228  
D.B. 6907, Pg. 147 Parcel ID 008702650000  
Zone: RR, R4 Form Dist: Neighborhood  
This survey complies with 201 KAR 18:150





**TAB 7  
PROPOSED  
ADDITIONAL  
BINDING ELEMENTS**



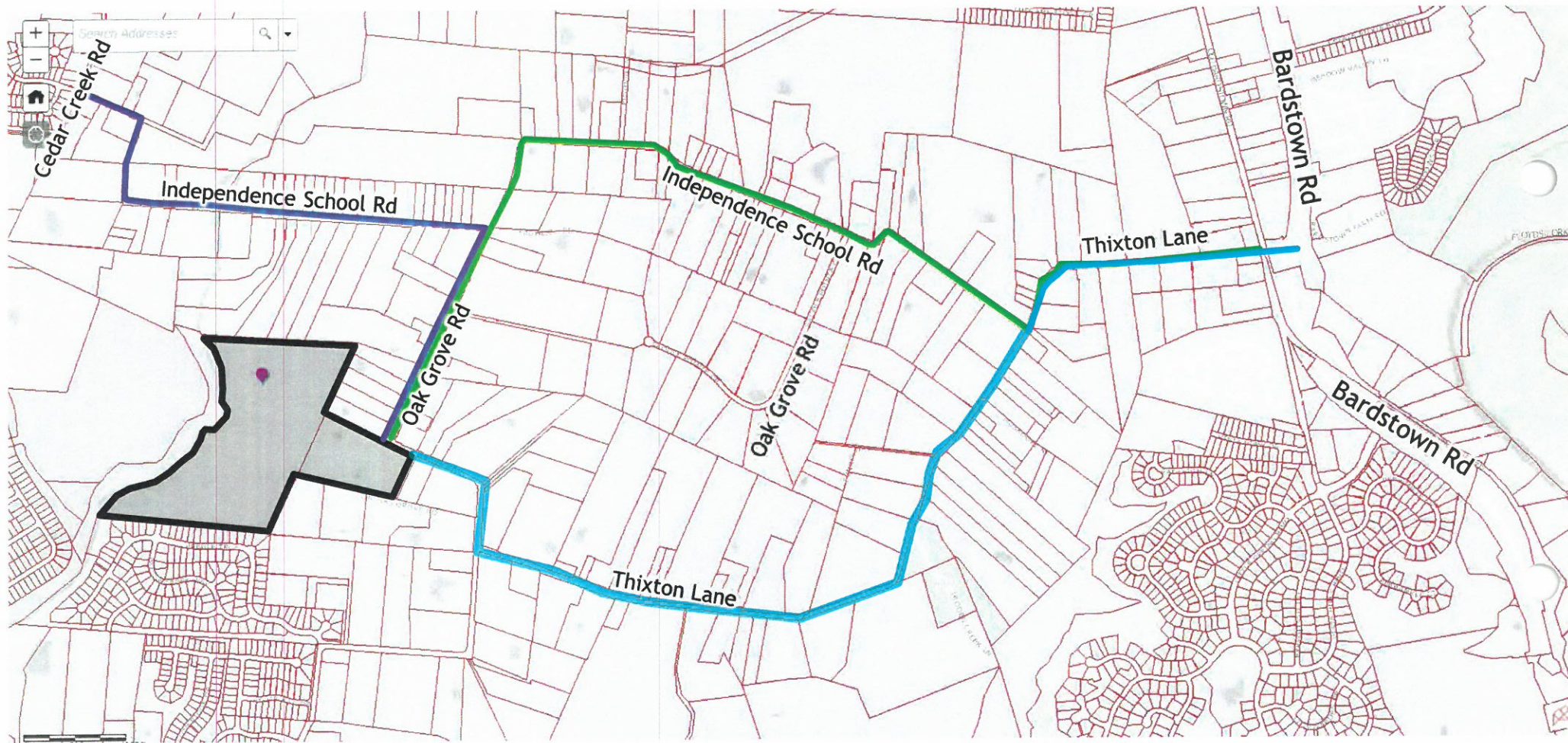


## PROPOSED ADDITIONAL BINDING ELEMENT

- Developer to construct a right-hand turn lane on eastbound Thixton Lane
- Developer to widen Oak Grove Road, Independence School Road and Thixton Lane to 18' width where deficient



- Developer to improve to minimum 18 ft width





# Survey of Independence School Road Existing Roadway Width

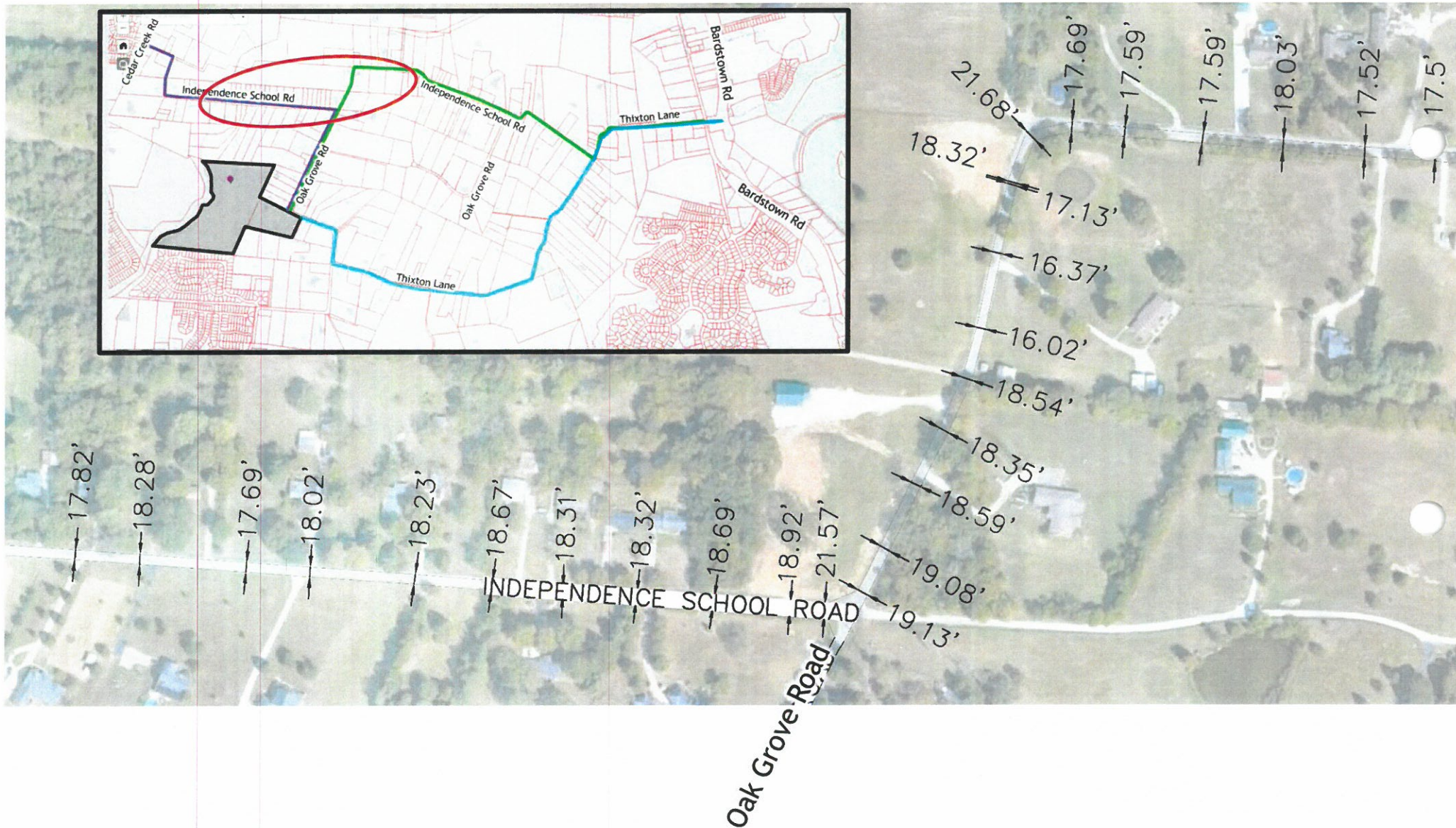
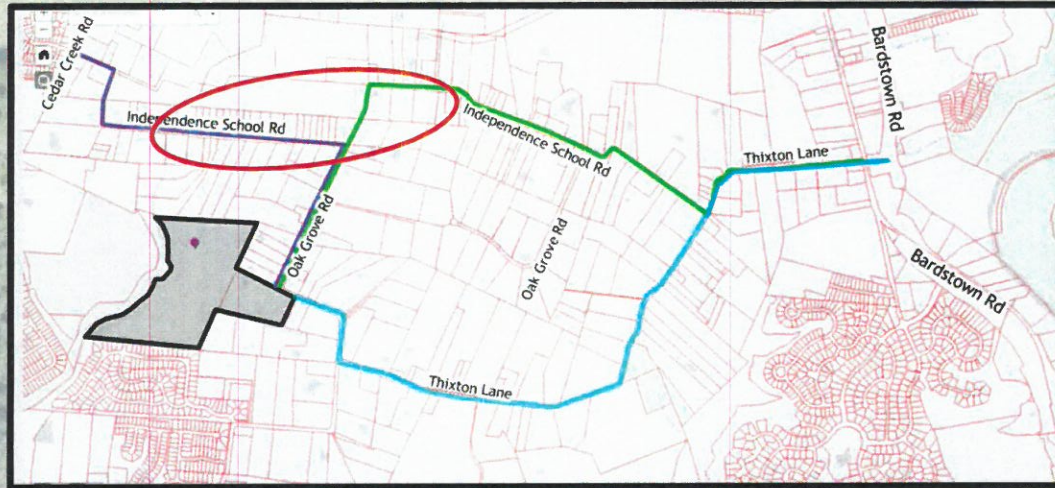
- Developer to improve to minimum 18 ft width





# Survey of Independence School Road Existing Roadway Width

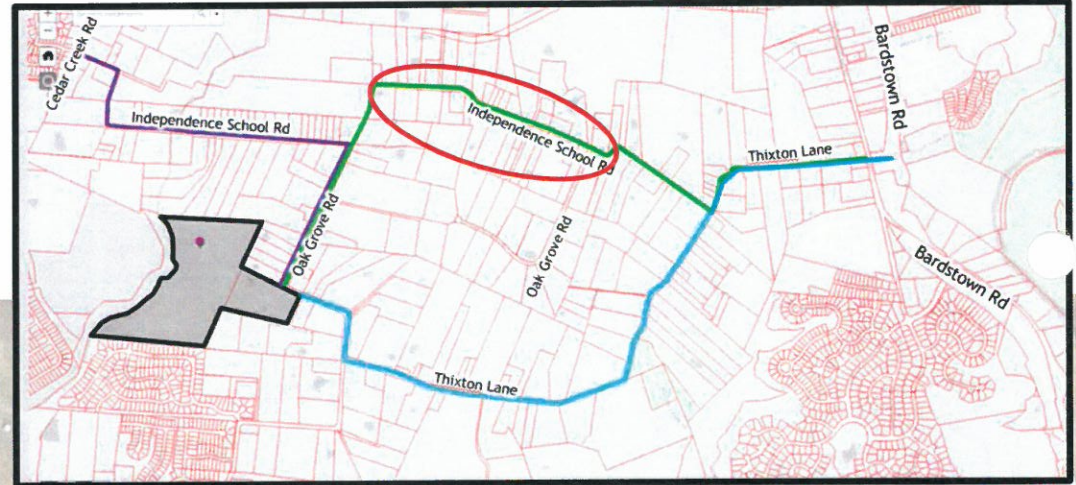
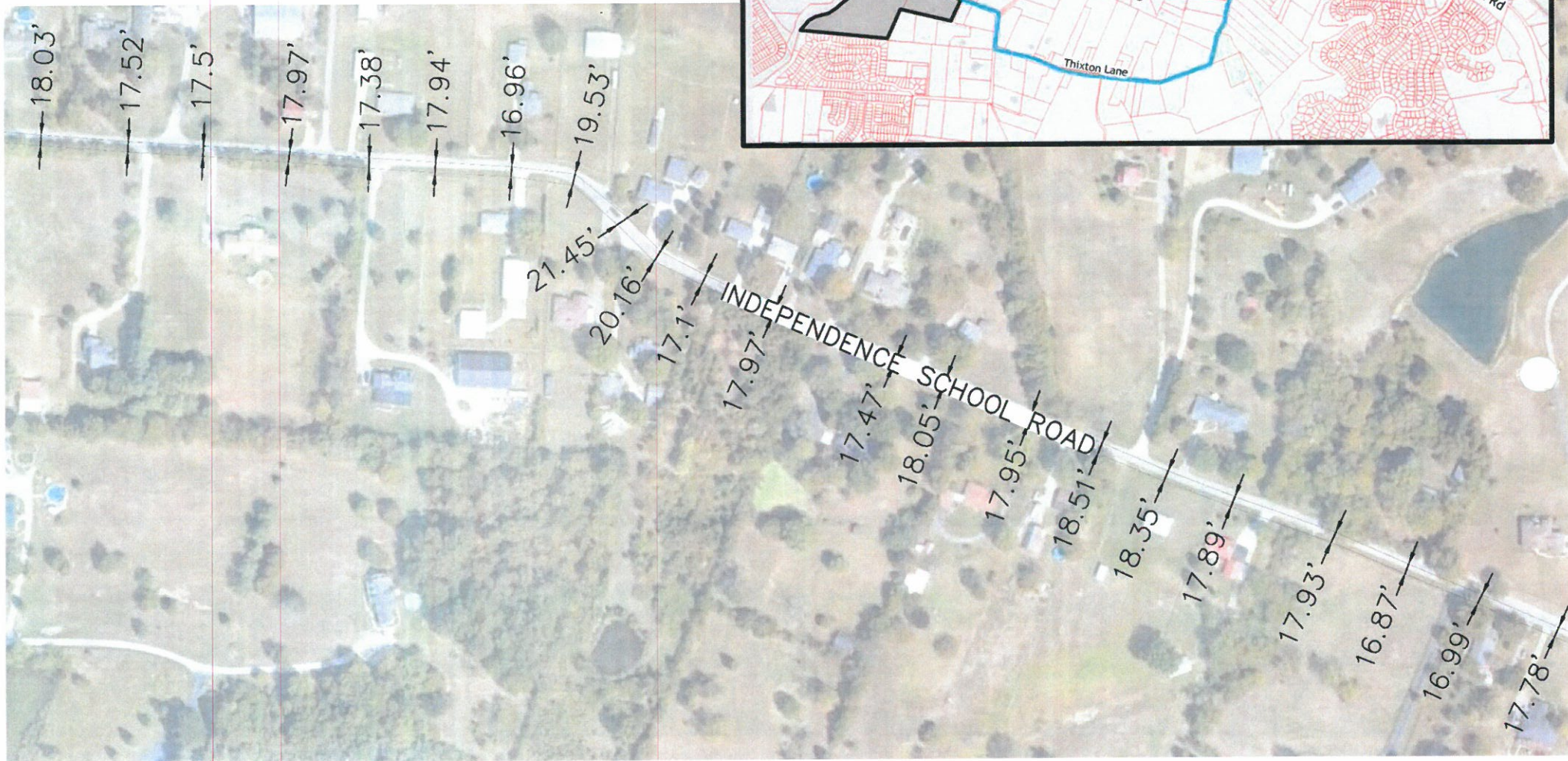
- Developer to improve to minimum 18 ft width





# Survey of Independence School Road Existing Roadway Width

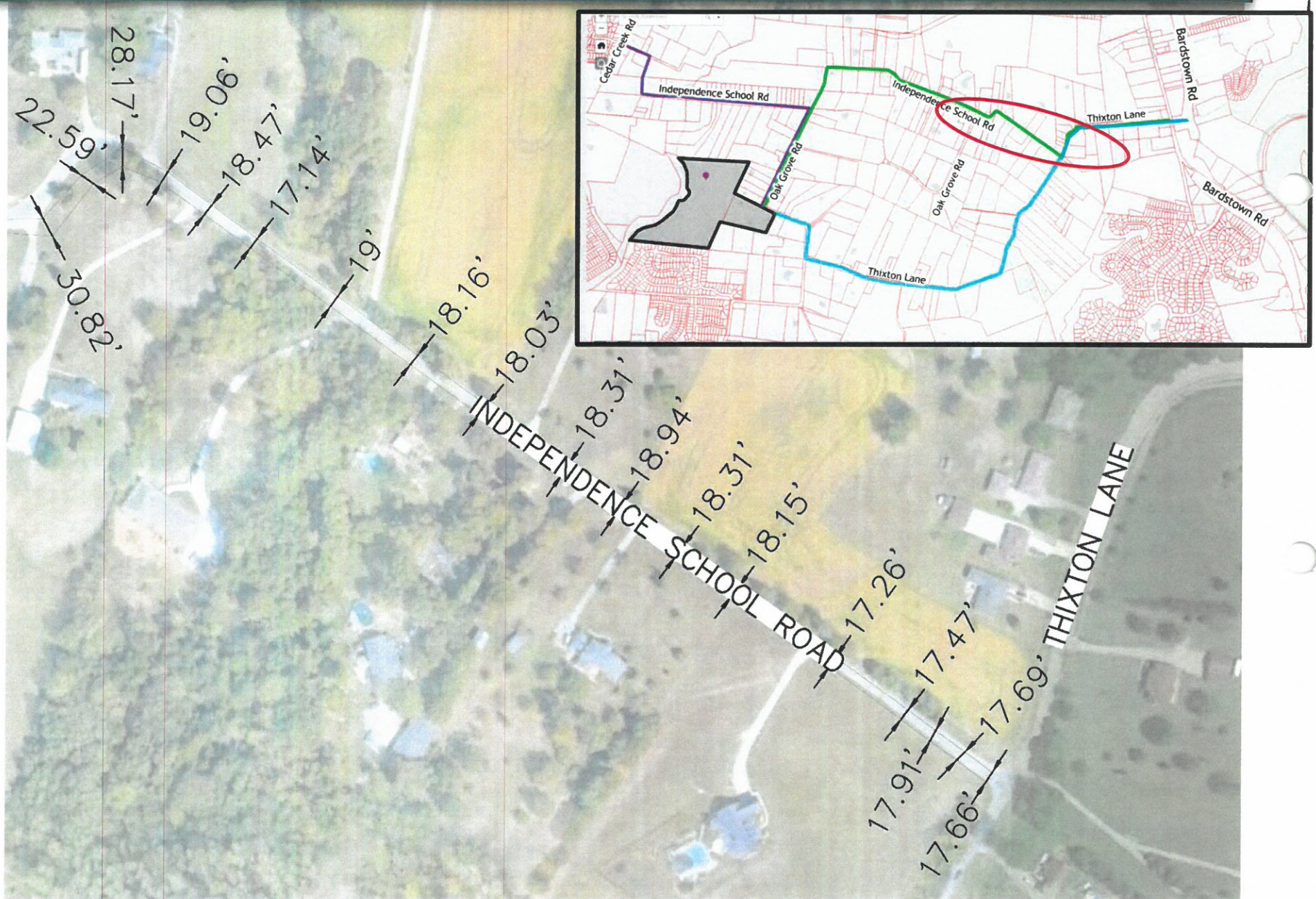
- Developer to improve to minimum 18 ft width





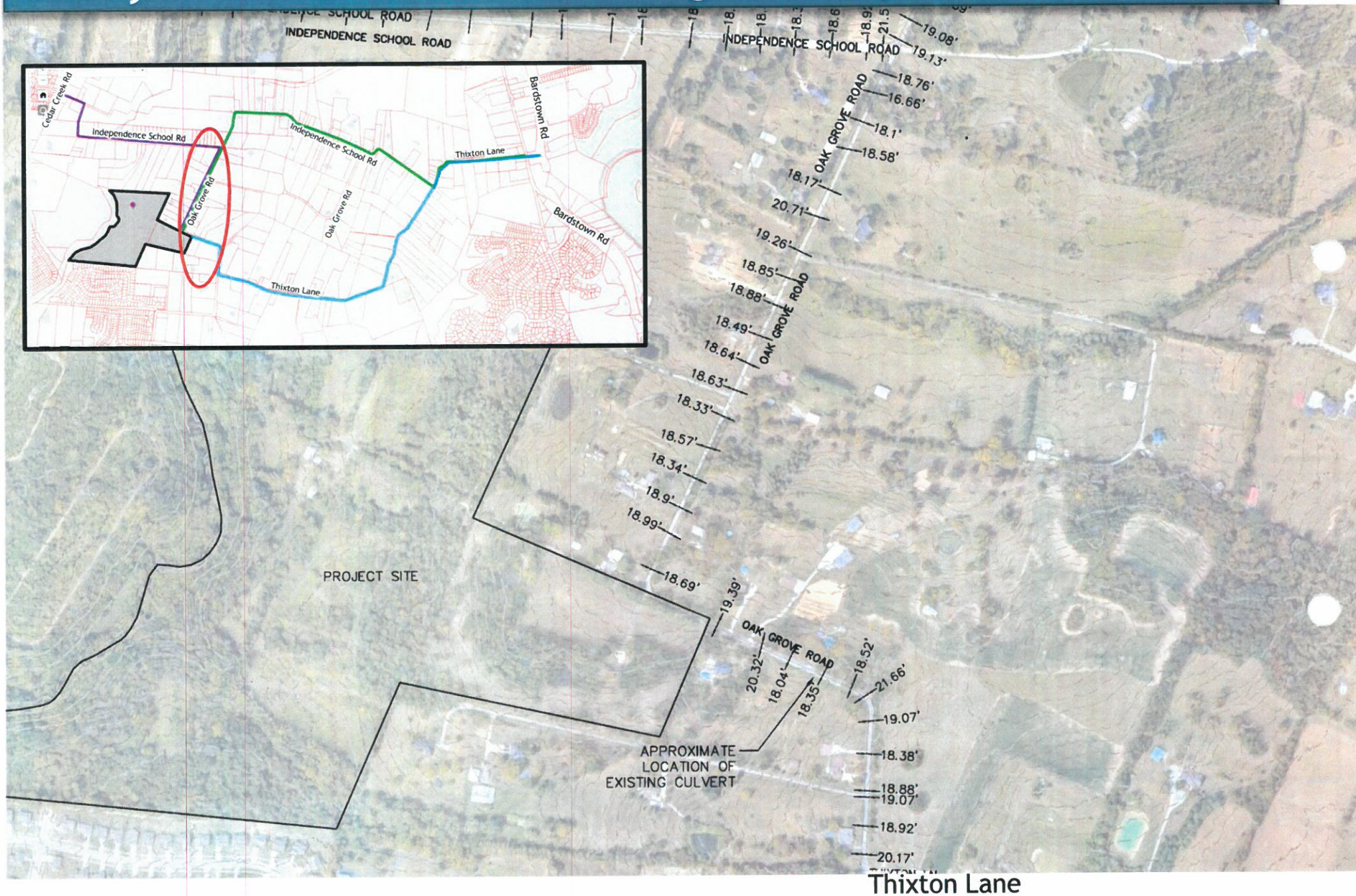
# Survey of Independence School Road Existing Roadway Width

- Developer to improve to minimum 18 ft width





# Survey of Oak Grove Road Existing Roadway Width





|                                       |                   |                   |                   |                   |                   |                   |
|---------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| <b>Thixton Lane at Pebble Trace</b>   |                   |                   |                   |                   |                   |                   |
| Thixton Lane Eastbound                | A<br>7.4          | A<br>7.5          | A<br>7.6          | A<br>7.6          | A<br>7.7          | A<br>7.8          |
| Pebble Trace Southbound               | A<br>9.7          | A<br>9.8          | B<br>10.4         | B<br>10.4         | B<br>10.6         | B<br>11.6         |
| <b>Bardstown Road at Thixton Lane</b> |                   |                   |                   |                   |                   |                   |
|                                       | <b>B<br/>14.9</b> | <b>B<br/>16.0</b> | <b>B<br/>16.7</b> | <b>C<br/>29.3</b> | <b>C<br/>32.4</b> | <b>D<br/>48.3</b> |
| Thixton Lane Eastbound                | D<br>43.3         | D<br>44.4         | E<br>72.2         | E<br>64.8         | E<br>69.1         | E<br>66.6         |
| Bardstown Road Northbound             | B<br>12.3         | B<br>13.4         | B<br>11.0         | B<br>13.7         | B<br>16.2         | B<br>21.2         |



**Proposed Binding Element:**  
Developer to construct a right-hand turn lane on eastbound Thixton Lane





**TAB 8**  
**TRAFFIC STUDY**





# final report

September 16, 2021

## Traffic Impact Study

Oak Grove Subdivision  
10212 Oak Grove Road  
Louisville, KY

Prepared for

Louisville Metro Planning Commission



DIANE B. ZIMMERMAN  
Traffic Engineering, LLC

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Bensley, KY 40019  
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**Table 2. Peak Hour Level of Service**

| Approach                                       | A.M.              |                   |                   | P.M.              |                   |                   |
|------------------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|                                                | 2021 Existing     | 2027 No Build     | 2027 Build        | 2021 Existing     | 2027 No Build     | 2027 Build        |
| <b>Cedar Creek Road at Independence School</b> |                   |                   |                   |                   |                   |                   |
| Independence School Road Eastbound             | A<br>8.8          | A<br>8.9          | A<br>8.9          | A<br>9.1          | A<br>9.2          | A<br>9.3          |
| Independence School Road Westbound             | B<br>10.1         | B<br>10.4         | B<br>10.9         | B<br>10.9         | B<br>11.3         | B<br>11.9         |
| Cedar Creek Road Northbound                    | A<br>7.3          | A<br>7.3          | A<br>7.3          | A<br>7.3          | A<br>7.3          | A<br>7.3          |
| Cedar Creek Road Southbound                    | A<br>7.7          | A<br>7.7          | A<br>7.6          | A<br>7.9          | A<br>8.0          | A<br>8.1          |
| <b>Oak Grove Road at Thixton Lane</b>          |                   |                   |                   |                   |                   |                   |
| Thixton Lane Westbound                         | A<br>9.5          | A<br>9.6          | B<br>11.3         | B<br>10.0         | B<br>10.2         | B<br>12.6         |
| Oak Grove Road Southbound                      | A<br>8.1          | A<br>8.2          | A<br>8.5          | A<br>7.8          | A<br>7.8          | A<br>7.8          |
| <b>Oak Grove Road at Entrance</b>              |                   |                   |                   |                   |                   |                   |
| Oak Grove Road Westbound                       |                   |                   | A<br>9.2          |                   |                   | A<br>9.9          |
| Oak Grove Road Southbound                      |                   |                   | A<br>7.5          |                   |                   | A<br>7.4          |
| <b>Thixton Lane at Pebble Trace</b>            |                   |                   |                   |                   |                   |                   |
| Thixton Lane Eastbound                         | A<br>7.4          | A<br>7.5          | A<br>7.6          | A<br>7.6          | A<br>7.7          | A<br>7.8          |
| Pebble Trace Southbound                        | A<br>9.7          | A<br>9.8          | B<br>10.4         | B<br>10.4         | B<br>10.6         | B<br>11.6         |
| <b>Bardstown Road at Thixton Lane</b>          | <b>B<br/>14.9</b> | <b>B<br/>16.0</b> | <b>B<br/>16.7</b> | <b>C<br/>29.3</b> | <b>C<br/>32.4</b> | <b>D<br/>48.3</b> |
| Thixton Lane Eastbound                         | D<br>43.3         | D<br>44.4         | E<br>72.2         | E<br>64.8         | E<br>69.1         | E<br>66.6         |
| Bardstown Road Northbound                      | B<br>12.3         | B<br>13.4         | B<br>11.0         | B<br>13.7         | B<br>16.2         | B<br>21.2         |

| Approach                  | A.M.          |               |            | P.M.          |               |            |
|---------------------------|---------------|---------------|------------|---------------|---------------|------------|
|                           | 2021 Existing | 2027 No Build | 2027 Build | 2021 Existing | 2027 No Build | 2027 Build |
| Bardstown Road Southbound | B<br>15.4     | B<br>16.3     | B<br>14.3  | C<br>32.6     | D<br>35.4     | E<br>60.5  |

Key: Level of Service. Delay in seconds per vehicle

The entrances were evaluated for turn lanes using the Kentucky Transportation Cabinet [Highway Design Guidance Manual](#) dated July, 2020. Using the volumes in Figure 6, no turn lanes are recommended at the entrance. The recommended traffic control is that westbound Oak Grove Road be controlled with a stop sign. Similar to the intersection of Thixton Lane and Oak Grove Road.

## CONCLUSIONS

Based upon the volume of traffic generated by the development and the amount of traffic forecasted for the year 2027, there will be a slight impact to the existing highway network. No improvements are required.



|                                       |             |             |             |             |             |             |
|---------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Thixton Lane at Pebble Trace</b>   |             |             |             |             |             |             |
| Thixton Lane Eastbound                | A           | A           | A           | A           | A           | A           |
|                                       | 7.4         | 7.5         | 7.6         | 7.6         | 7.7         | 7.8         |
| Pebble Trace Southbound               | A           | A           | B           | B           | B           | B           |
|                                       | 9.7         | 9.8         | 10.4        | 10.4        | 10.6        | 11.6        |
| <b>Bardstown Road at Thixton Lane</b> |             |             |             |             |             |             |
|                                       | <b>B</b>    | <b>B</b>    | <b>B</b>    | <b>C</b>    | <b>C</b>    | <b>D</b>    |
|                                       | <b>14.9</b> | <b>16.0</b> | <b>16.7</b> | <b>29.3</b> | <b>32.4</b> | <b>48.3</b> |
| Thixton Lane Eastbound                | D           | D           | E           | E           | E           | E           |
|                                       | 43.3        | 44.4        | 72.2        | 64.8        | 69.1        | 66.6        |
| Bardstown Road Northbound             | B           | B           | B           | B           | B           | B           |
|                                       | 12.3        | 13.4        | 11.0        | 13.7        | 16.2        | 21.2        |







**TAB 9  
STATEMENT OF COMPLIANCE  
FILED WITH THE ORIGINAL  
ZONE CHANGE APPLICATION  
WITH ALL APPLICABLE  
GOALS OF THE 2040 PLAN  
AND WAIVER JUSTIFICATION**







**TAB 10  
PROPOSED FINDINGS  
OF FACT PERTAINING  
TO COMPLIANCE WITH  
THE 2040 PLAN AND  
WAIVER CRITERIA**





# BARDENWERPER, TALBOTT & ROBERTS, PLLC

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## **PROPOSED FINDINGS OF FACT REGARDING COMPLIANCE WITH ALL APPLICABLE GOALS OF THE 2040 PLAN**

Applicant: JS Acquisition, LLC

Owner: Parker Living Trust; Estate of Doris Ann Parker

Location: 10212 and 10302 Oak Grove Road

Proposed Use: Single Family Residential Subdivision

Engineers, Land Planners and Landscape Architects: Mindel Scott & Associates

Request: Zone change from RR to R-4

The Louisville Metro Planning Commission, having heard testimony before its Land Development & Transportation Committee, in the Public Hearing held on December 16, 2021 and having reviewed evidence presented by the applicant and the staff's analysis of the application, make the following findings:

### **COMMUNITY FORM**

*Goal 1 – Guide the form and design of development to respond to distinctive physical, historic and cultural qualities.*

**WHEREAS**, the proposed zone change complies with all of the applicable Objectives and Policies of Goal 1, and specifically with Policies 7 and 9, because the site is located in the Neighborhood Form District which encourages a diversity of housing types, ranging from low-density residential to higher density providing a range of housing opportunities; this proposed development and the rezoning from RR to R-4 is compatible and in keeping with the current zoning and use of the surrounding properties and those in the area, particularly when it is taken into consideration that the property had previously been zoned R-4, like those in the area, prior to the property owner's voluntary downzoning in 2008; the proposed preliminary subdivision plan shows a return to the prior R-4 zoning district, along with a density transfer subdivision application due to the steep slopes on the property; and because the proposed use fits within and is compatible with the surrounding properties, the subdivision plan demonstrates that the proposal attempts to provide screening and buffering, to the extent possible; and

*Goal 2 – Encourage sustainable growth and density around mixed-use centers and corridors.*

**WHEREAS**, the proposed zone change complies with all of the applicable Objectives and Policies of Goal 2, and specifically with Policy 9 because the area is being developed by numerous other developers with subdivisions providing needed residential options for those



working in the Bardstown Road and other nearby commercial corridors; further, the property preserves a large amount of open space along Cedar Creek due to the 687,000 square feet of proposed open space and 587,000 square feet of natural resource open space; and

*Goal 3 – Enhance neighborhood by protecting and integrating open space, watershed and other natural resources.*

**WHEREAS**, the proposed zone change complies with all of the applicable Objectives and Policies of Goal 3, and specifically with Policy 10 because the proposed development has been designed to preserve the open space areas shown on the plan, which as said, includes 687,000 square feet of open space and 587,000 square feet of natural resource open space, while at the same time providing a very substantial vegetative buffer along Cedar Creek; these open space areas were also designed to be in areas that protect the natural features on the property and reduce the impacts of stormwater drainage with two very large detention basins being provided onsite despite other developments in the immediate area draining directly into Cedar Creek; the result of these proposed detention basins is the fact that this plan exceeds those of other subdivisions in the area as to stormwater management; these open spaces will be owned by the proposed owners in common and maintained by the homeowners association; there are no wet or highly permeable soils and the severe, steep or unstable slopes on the subject property are proposed as natural resource open space to avoid erosion problems; and all streambank setback buffers are being provided in full; and

*Goal 4 Promote and preserve the historic and archaeological resources that contribute to our authenticity.*

**WHEREAS**, the proposal complies with all of the applicable Objectives and Policies of Goal 4 specifically Policies 2 and 3 because there are no distinctive cultural or natural features that will not be retained and there are no distinctive historic resources; and

## **MOBILITY**

*Goal 1 – Implement an accessible system of alternative transportation modes.*

**WHEREAS**, the proposed zone change complies with all of the applicable, Objectives and Policies 1 and 4 of Goal 1, because this proposed rezoning and DDDP/Subdivision Plan will cater to those who want to live in close proximity to the Bardstown Road corridor and the Cedar Creek Road corridor; sidewalks are being provided along Oak Grove Road frontage and on the internal streets as shown; as previously stated, this proposed subdivision is located in close proximity to the Bardstown Road corridor providing convenient access to goods and services, as well as the employment centers in the area; and

*Goal 2 – Plan, build and maintain a safe, accessible and efficient transportation system.*

**WHEREAS**, the proposed zone change complies with all of the applicable Objectives and Policies of Goal 2, and specifically with Policies 3, 4, 5, and 6, because the access to this single family development is via a secondary collector road (Oak Grove Road) and a primary collector road (Thixton Lane); connections into the adjoining Creekview Estates subdivision to the south and stub streets are provided for future development south of the site along Thomas Grove Road;



Oak Grove Road has been reviewed for roadway width and the applicant is proposing to widen the few areas of Oak Grove Road and Independence School Road with less than 18' of roadway width to a full 18' width; and applicant is committing to pay for and install a dedicated right turn lane on eastbound Thixton Lane at Bardstown Road; and the internal streets were designed to maximize both the pedestrian connectivity and sense of place, but also to provide the best vehicular connectivity with least impervious surface; and

*Goal 3 – Encourage land use and transportation patterns that connect Louisville Metro and support future growth.*

**WHEREAS**, the proposed zone change complies with all of the applicable Objectives and Policies of Goal 3, and specifically with Policies 2, 3, 5, 6, 7, 8, 9, 10 and 21, because this proposed single family development will provided needed housing very close to the activity centers along Bardstown Road; the location of this subdivision close proximity to Bardstown Road activity centers will provide those working in the area with an opportunity to purchase a new home not readily available due to the incredible housing shortage currently in the market; as such, many of the residents will likely live in very close proximity to work or their customary marketplace; a diversity of housing is needed in Louisville Metro to allow its continued growth in corridors like Bardstown Road to reduce vehicle miles traveled for those moving to the area through its proximity to the previously mentioned employment centers and marketplace options and to allow seniors to age in place; and the subject property's close proximity to the above will also help eliminate multiple automobile trips (vehicle miles travelled) for such services; and

### **COMMUNITY FACILITIES**

*Goal 2 – Plan for community facilities to improve quality of life and meet anticipated growth.*

**WHEREAS**, the proposed zone change complies with all of the applicable Objectives and Policies of Goal 2, and specifically with Policies 1, 2, and 3 because the subject property is currently served by existing utilities with sufficient capacity for this proposed development as will be confirmed through all utility providers through this rezoning process; these confirmations specifically include the Louisville Water Company's confirmation of sufficient water service capacity and the Metropolitan Sewer District's confirmation of adequate sanitary sewer capacity; and

### **LIVABILITY**

*Goal 1 – Protect and enhance the natural environment and integrate it with the built environment as development occurs.*

**WHEREAS**, the proposed zone change complies with all of the applicable Objectives and Policies of Goal 1, and specifically with Policies 5, 17 and 21 because the proposed development will add new native species landscaping as shown on the development plan and as demonstrated on the landscape plan that will ultimately be prepared and submitted for approval; the existing Cedar Creek to the west will have all streambank setbacks provided along with additional on-site detention to ensure no adverse effects to Cedar Creek; the surface water runoff will be improved from its current condition; the added detention and water quality unit will not only help mitigate



the impacts of this development but likely help with any existing floodplains; and a karst survey will be provided; and

## **HOUSING**

*Goal 1 – Expand and ensure a diverse range of housing choices.*

**WHEREAS**, the proposed zone change complies with all of the applicable Objectives and Policies of Goal 1, and specifically with Policies 1, 2, and 3, because the proposed plan will add to the variety of housing types in the area providing more options to age in place in a newer home on a smaller lot with less maintenance obligations supports aging in place; it is located in close proximity to the Bardstown Road corridor which provides goods, services including medical offices and other supportive services as well as transportation options; and

*Goal 2 – Facilitate the development of connected, mixed-use neighborhoods.*

**WHEREAS**, the proposed zone change complies with all of the applicable Objectives and Policies of Goal 2, and specifically with Policies 1 and 2 because its design does encourage inter-generational and mixed-income development that is connected to the existing neighborhood and surrounding area within proximity to multi-modal transportation and amenities providing neighborhood goods and services; and

*Goal 3 – Ensure long-term affordability and livable options in all neighborhoods.*

**WHEREAS**, the proposed zone change complies with all of the applicable Objectives and Policies of Goal 3, including Policies 1, 2, and 3 because the proposed development provides a variety of ownership and unit costs with an opportunity for people to live in quality, variable priced housing in this area of Metro Louisville and will not displace existing residents with a plan providing smaller lot sizes to enable affordable housing; and

\* \* \*

**WHEREAS**, for all the reasons explained at LD&T and the Planning Commission public hearing and also in the public hearing exhibit books, on the approved detailed district development plan, this application also complies with all other applicable Goals of the 2040 Plan;

**NOW, THEREFORE**, the Louisville Metro Planning Commission hereby recommends to the Louisville Metro Council that it rezone the subject property from RR to R-4 and approves the Detailed District Development Plan.



### Waiver Finding of Fact

Waiver of Section 5.9.2.A.1.a.ii of the Land Development Code to not provide a stub connection to the adjoining property to the west and to the undeveloped property to the north

**WHEREAS**, the waiver will not adversely affect adjacent property owners because the only property that the connection to the west would potentially serve is the vacant 49.5 acre tract of the subject site owned by the Regional Airport Authority, who presumably wouldn't want a connection anyway; requiring a connection to the west would only provide access to this adjoining property and not all the way to Cedar Creek Road; the properties to the north along Independence School Road had been a part of a prior development application that also included the subject property, but that owner decided to instead subdivide the property into residential lots large enough to not require sewer and sell; as a result, these lots, while vacant, are already somewhat developed; and the likelihood of these being again consolidated to where a road would make feasible sense is remote; and

**WHEREAS**, the waiver will not violate the Comprehensive Plan for all the reasons set forth in the Detailed Statement of Compliance with all applicable Guidelines and Policies of the Comp Plan 2040 filed with the rezoning application and because there are no new potential impacts to be mitigated by this request to not provide a connection; and

**WHEREAS**, the extent of waiver of the regulation is the minimum necessary to afford relief to the applicant because a stub connection to the property to the west would not be feasible due to the enormous ravine and the Cedar Creek crossing; a connection to this property is virtually impossible due to the large ravine that holds Cedar Creek, which is 40 feet lower than the top of both adjoining properties, requiring a very large bridge spanning over 400 feet; this would seem to be a perfect candidate for a situation with a determination of infeasibility due to physical or environmental constraints; as to the property to the north, the waiver is requested as it is arguable whether a connection is even required with the property having just been subdivided and sold for individual home construction; and

**WHEREAS**, strict application of the provisions of the regulation would deprive the applicant of a reasonable use of the land or would create an unnecessary hardship on the applicant because in order to provide a stub to the adjoining property to the west, a significant bridge would have to be constructed to cross the ravine and Cedar Creek, making the entire project infeasible; the applicant would only have the ability to construct half of the western bridge with no cost sharing agreement with the Regional Airport Authority; as to the property to the north, if any of the 5 acre lots were developed, a roadway through the property would take up the entire width of these narrow lots;

**NOW, THEREFORE**, the Louisville Metro Planning Commission hereby approves this Waiver.



### Waiver Findings of Fact

Waiver of LDC Section 7.3.30.E to allow more than 15% of a required rear yard of a buildable lot to be encompassed by a drainage easement.

**WHEREAS**, the waiver will not adversely affect adjacent property owners because it is a typical occurrence for sewer and drainage easements to be located in the rear yard, since this does not reduce the depth of the yard and since the easement is needed to provide a space within it that will keep any increased runoff from this development from causing a negative impact to the adjacent properties; and

**WHEREAS**, the waiver will not violate the Comprehensive Plan for all the reasons set forth in the Detailed Statement of Compliance with all applicable Guidelines and Policies of the Plan 2040 Comprehensive Plan filed with the original rezoning application and since adequate drainage facilities will be provided to serve the development, since this will not affect the applicant's ability to preserve existing vegetation nor affect any other aspect of this developments compliance with either the Plan 2040 or the requirements of the Land Development Code; and

**WHEREAS**, the extent of waiver of the regulation is the minimum necessary to afford relief to the applicant because in order to allow for the best design of the individual lots; it has been generally accepted that drainage easements be located in the rear yard either along the rear property line or offset from this area typically used to preserve existing vegetation; without the waiver the applicant would be required to locate the drainage way a minimum of 20' from the rear property line and therefore in close proximity to the homes; it would reduce the usable area close to the homes that would otherwise be used by the homeowners as their private yard, an area typically reserved for outdoor dining, entertainment, relaxation and/or recreation; and

**WHEREAS**, strict application of the provisions of the regulation would deprive the applicant of a reasonable use of the land or would create an unnecessary hardship on the applicant because locating the drainage easement in the rear yard has been the preferred and acceptable practice and now requiring it to be a minimum of 20 feet off the rear property line create an unnecessary hardship for the homeowner by reducing the usable area of the private yard with a ditch separating the area adjacent to the home from the rest of the rear yard;

**NOW, THEREFORE**, the Louisville Metro Planning Commission hereby approves this Waiver.



# final report

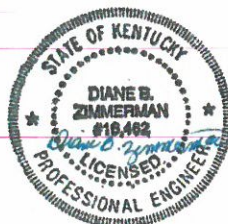
September 16, 2021  
Revised November 11, 2021

## Traffic Impact Study

Oak Grove Subdivision  
10212 Oak Grove Road  
Louisville, KY

Prepared for

Louisville Metro Planning Commission



**DIANE B. ZIMMERMAN**  
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## INTRODUCTION

The site plan for the proposed Oak Grove subdivision shows 263 single-family lots on Oak Grove Road in Louisville, KY. **Figure 1** displays a map of the site. Access to the site will be from Oak Grove Road. The subdivision also connects to Mossy Creek Way. The purpose of this study is to examine the traffic impacts of the development upon the adjacent highway system. For this study, the impact area was defined to be the intersections of Oak Grove Road with Thixton Lane, Thixton Lane with Pebble Trace and Bardstown Road, and Independence School Road with Cedar Creek Road.

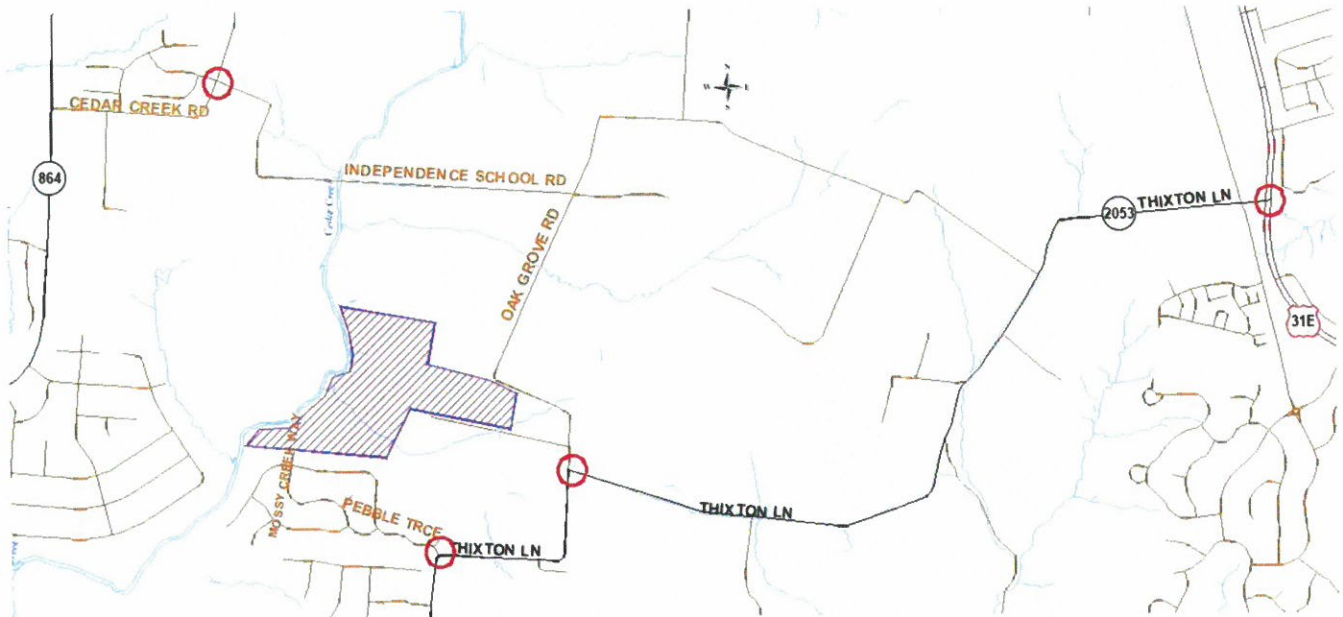


Figure 1. Site Map

## EXISTING CONDITIONS

Oak Grove Road is a Metro-maintained road with an estimated 2021 ADT of 400 vehicles per day north of Thixton Lane, as estimated from the turning movement count. The road is a two-lane highway with nine-foot lanes with one-foot stabilized shoulders. The speed limit is 35 mph. There are no sidewalks. The intersection with Thixton Lane is controlled with a stop sign on the westbound approach of Thixton Lane.

Peak hour traffic counts for the intersections were obtained on Tuesday, August 24, 2021. The a.m. and p.m. peak hour varied between the intersections. **Figure 2** illustrates the existing a.m. and p.m. peak hour traffic volumes. The Appendix contains the full count data.



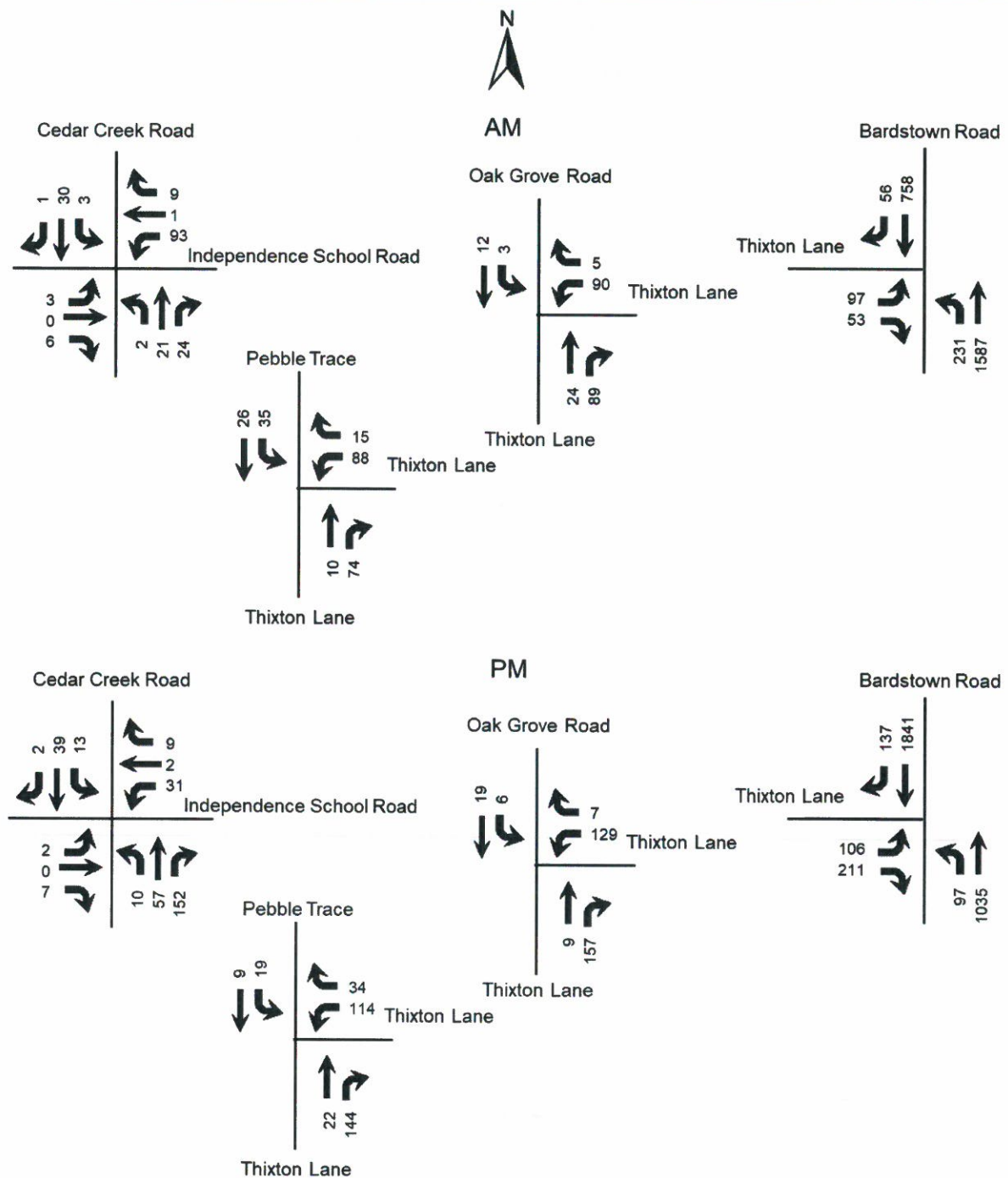


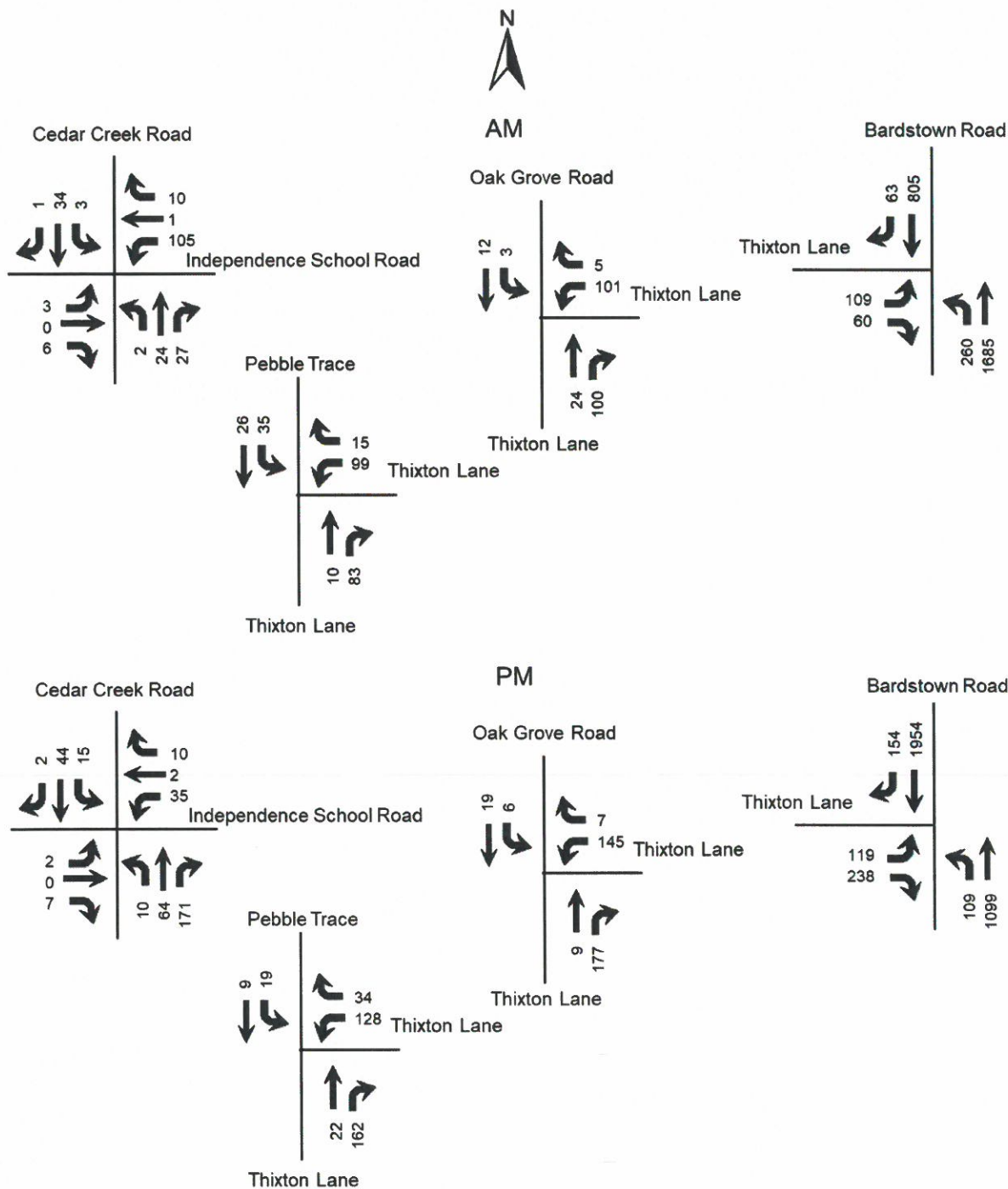
Figure 2. Existing Peak Hour Volumes

## FUTURE CONDITIONS

The project completion date is 2027. An annual growth rate of 2 percent was applied to the 2021 thru volumes on Thixton Lane and Cedar Creek Road. This was determined by the historical growth at KYTC station 274. One percent



annual growth was applied to the thru traffic on Bardstown Road. **Figure 3** displays the 2027 No Build peak hour volumes.



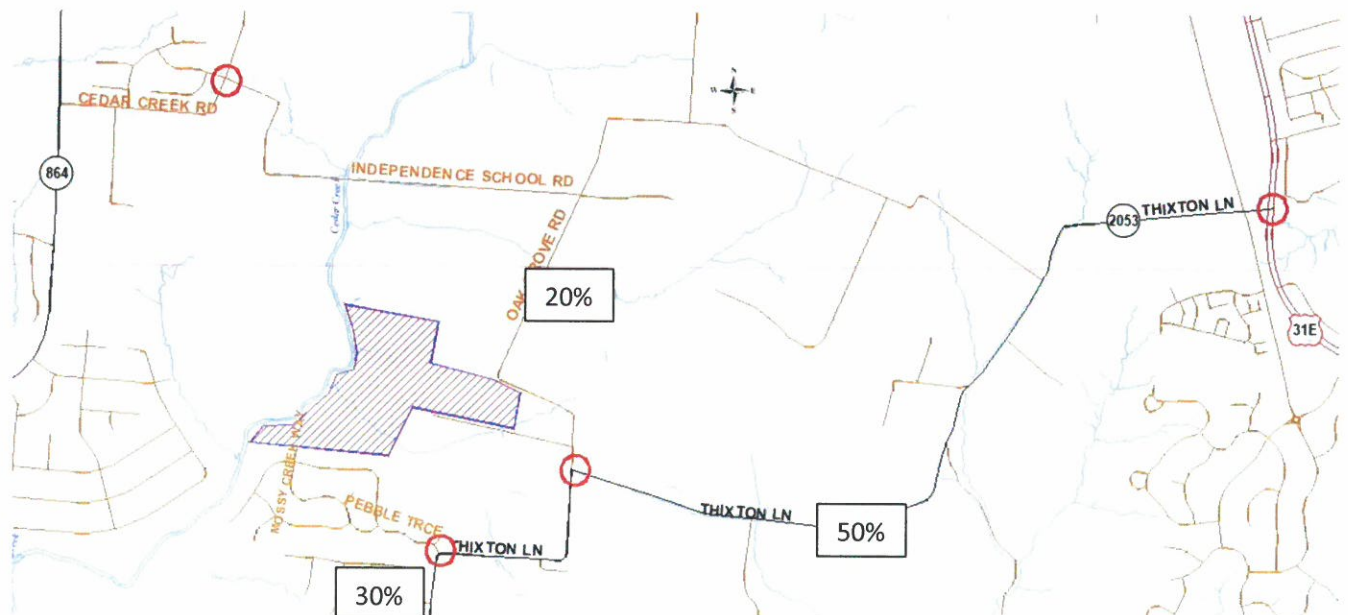


## TRIP GENERATION

The Institute of Transportation Engineers Trip Generation Manual, 10<sup>th</sup> Edition contains trip generation rates for a wide range of developments. The land use of "Single-Family Detached (210)" was reviewed and determined to be the best match. The trip generation results are listed in **Table 1**. The trips were assigned to the highway network with the percentages shown in **Figure 4**. **Figure 5** shows the trips generated by this development and distributed throughout the road network during the peak hours. **Figure 6** displays the individual turning movements for the peak hours when the development is completed. The entrance is shown in the diagram with a north/south orientation for simplicity on the figures. At the entrance Oak Grove Road is the southbound approach and the westbound approach and the entrance is the northbound approach.

**Table 1. Peak Hour Trips Generated by Site**

| Land Use                  | A.M. Peak Hour |    |     | P.M. Peak Hour |     |     |
|---------------------------|----------------|----|-----|----------------|-----|-----|
|                           | Trips          | In | Out | Trips          | In  | Out |
| Single-Family (263 units) | 192            | 48 | 144 | 257            | 162 | 95  |



**Figure 4. Trip Distribution Percentages**



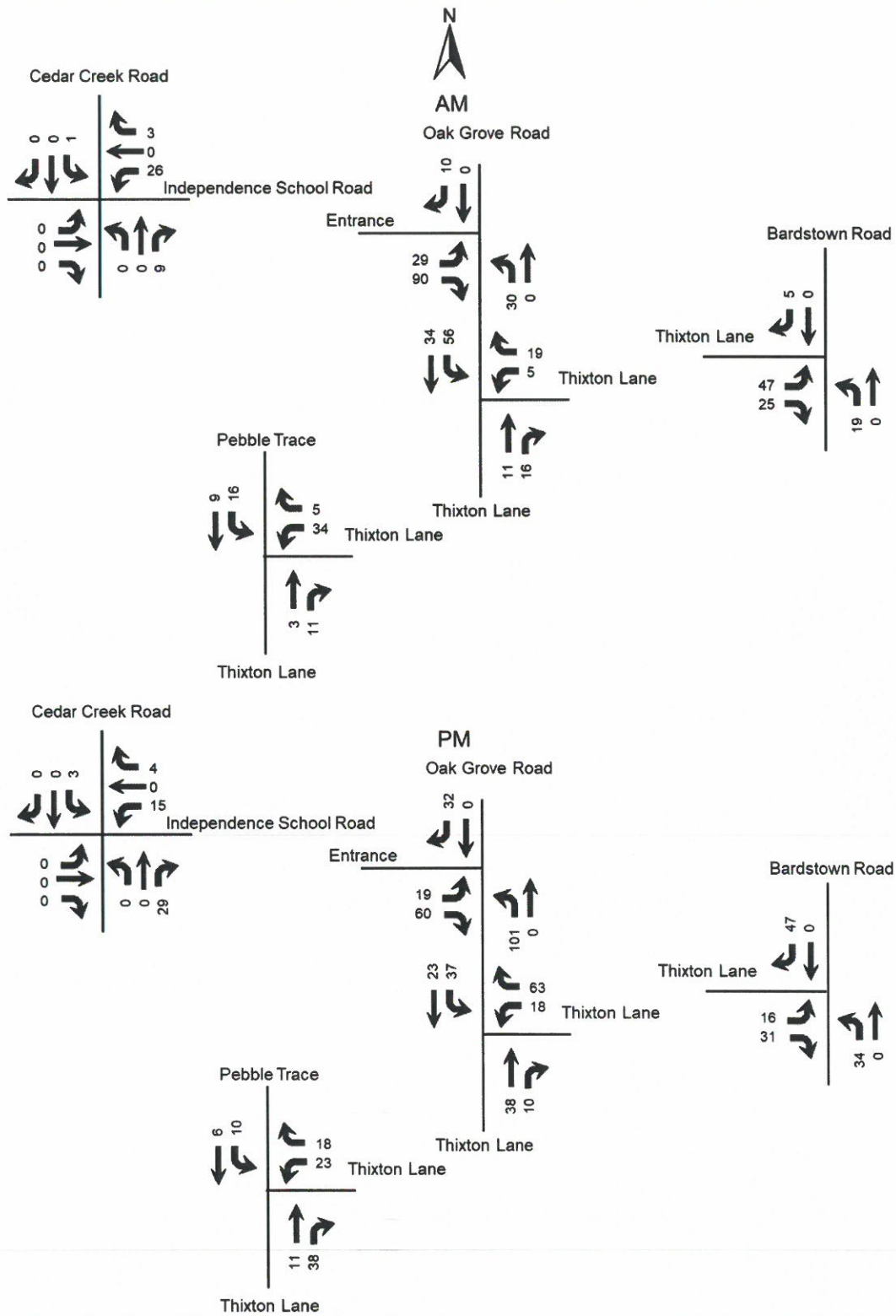


Figure 5. Peak Hour Trips Generated by Site



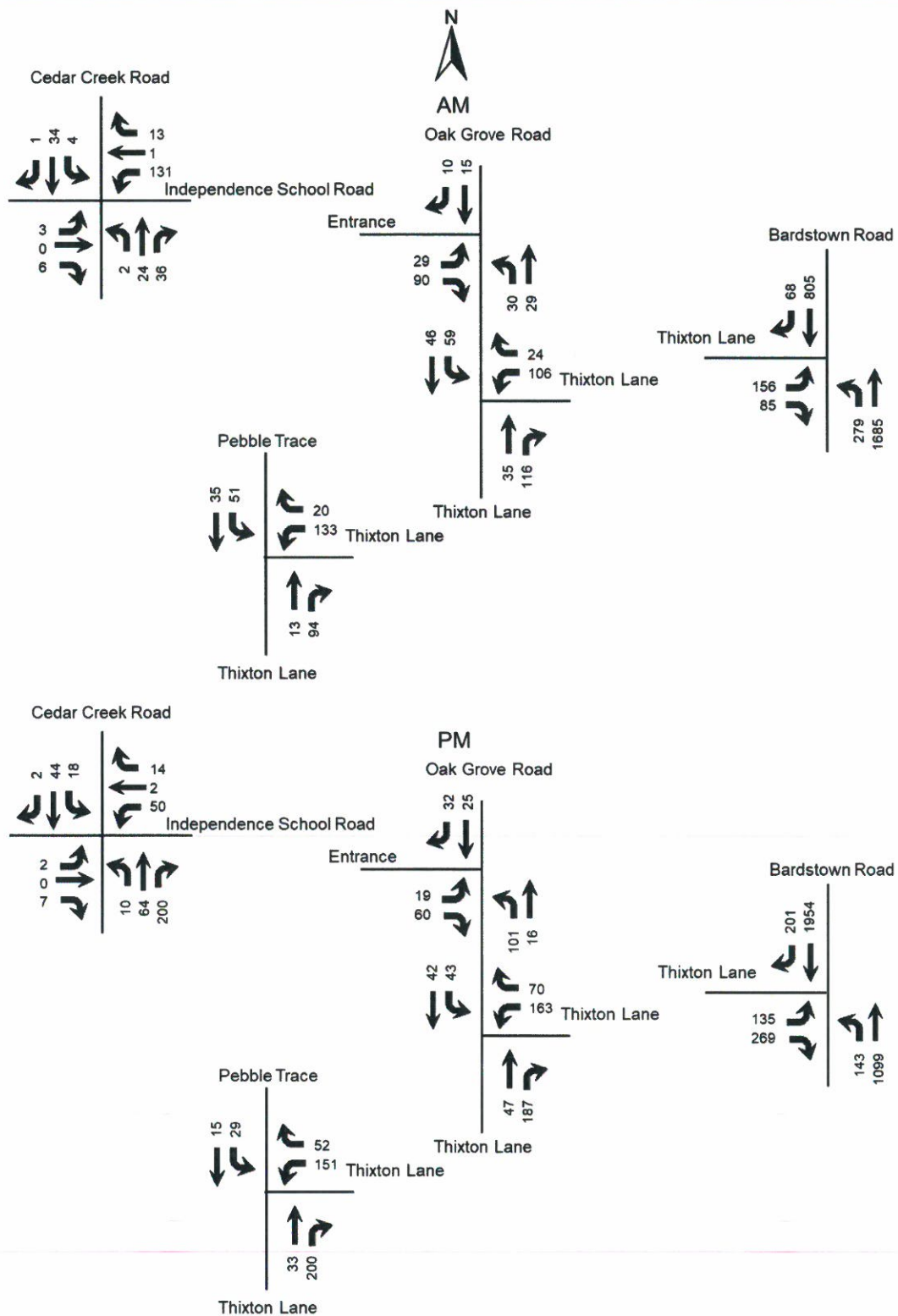


Figure 6. 2027 Build Peak Hour Volumes



## ANALYSIS

The qualitative measure of operation for a roadway facility or intersection is evaluated by assigning a "Level of Service". Level of Service is a ranking scale from A through F, "A" is the best operating condition and "F" is the worst. Level of Service results depend upon the facility that is analyzed. In this case, the Level of Service is based upon the total delay experienced for lanes at stop-controlled intersections.

To evaluate the impact of the proposed development, the vehicle delays at the intersections were determined using procedures detailed in the Highway Capacity Manual, 6<sup>th</sup> edition. Future delays and Level of Service were determined for the intersections using the HCS Streets (version 7.9.5) software. The delays and Level of Service are summarized in **Table 2**.

**Table 2. Peak Hour Level of Service**

| Approach                                       | A.M.              |                   |                   | P.M.              |                   |                   |
|------------------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|                                                | 2021 Existing     | 2027 No Build     | 2027 Build        | 2021 Existing     | 2027 No Build     | 2027 Build        |
| <b>Cedar Creek Road at Independence School</b> |                   |                   |                   |                   |                   |                   |
| Independence School Road Eastbound             | A<br>8.8          | A<br>8.9          | A<br>8.9          | A<br>9.1          | A<br>9.2          | A<br>9.3          |
| Independence School Road Westbound             | B<br>10.1         | B<br>10.4         | B<br>10.9         | B<br>10.9         | B<br>11.3         | B<br>11.9         |
| Cedar Creek Road Northbound                    | A<br>7.3          | A<br>7.3          | A<br>7.3          | A<br>7.3          | A<br>7.3          | A<br>7.3          |
| Cedar Creek Road Southbound                    | A<br>7.7          | A<br>7.7          | A<br>7.6          | A<br>7.9          | A<br>8.0          | A<br>8.1          |
| <b>Oak Grove Road at Thixton Lane</b>          |                   |                   |                   |                   |                   |                   |
| Thixton Lane Westbound                         | A<br>9.5          | A<br>9.6          | B<br>11.3         | B<br>10.0         | B<br>10.2         | B<br>12.6         |
| Oak Grove Road Southbound                      | A<br>8.1          | A<br>8.2          | A<br>8.5          | A<br>7.8          | A<br>7.8          | A<br>7.8          |
| <b>Oak Grove Road at Entrance</b>              |                   |                   |                   |                   |                   |                   |
| Oak Grove Road Westbound                       |                   |                   | A<br>9.2          |                   |                   | A<br>9.9          |
| Oak Grove Road Southbound                      |                   |                   | A<br>7.5          |                   |                   | A<br>7.4          |
| <b>Thixton Lane at Pebble Trace</b>            |                   |                   |                   |                   |                   |                   |
| Thixton Lane Eastbound                         | A<br>7.4          | A<br>7.5          | A<br>7.6          | A<br>7.6          | A<br>7.7          | A<br>7.8          |
| Pebble Trace Southbound                        | A<br>9.7          | A<br>9.8          | B<br>10.4         | B<br>10.4         | B<br>10.6         | B<br>11.6         |
| <b>Bardstown Road at Thixton Lane</b>          | <b>B<br/>14.9</b> | <b>B<br/>16.0</b> | <b>B<br/>16.7</b> | <b>C<br/>29.3</b> | <b>C<br/>32.4</b> | <b>D<br/>48.3</b> |
| Thixton Lane Eastbound                         | D<br>43.3         | D<br>44.4         | E<br>72.2         | E<br>64.8         | E<br>69.1         | E<br>66.6         |



|                           | A.M.             |                  |               | P.M.             |                  |               |
|---------------------------|------------------|------------------|---------------|------------------|------------------|---------------|
| Approach                  | 2021<br>Existing | 2027<br>No Build | 2027<br>Build | 2021<br>Existing | 2027<br>No Build | 2027<br>Build |
| Bardstown Road Northbound | B<br>12.3        | B<br>13.4        | B<br>11.0     | B<br>13.7        | B<br>16.2        | B<br>21.2     |
| Bardstown Road Southbound | B<br>15.4        | B<br>16.3        | B<br>14.3     | C<br>32.6        | D<br>35.4        | E<br>60.5     |

*Key: Level of Service, Delay in seconds per vehicle*

The entrances were evaluated for turn lanes using the Kentucky Transportation Cabinet Highway Design Guidance Manual dated July, 2020. Using the volumes in Figure 6, no turn lanes are recommended at the entrance on Oak Grove Road. The spreadsheet results for the turn lanes are in the Appendix. The recommended traffic control is that westbound Oak Grove Road be controlled with a stop sign. This is the same traffic control as the intersection of Thixton Lane and Oak Grove Road.

The Kentucky Transportation Cabinet requested an evaluation of the Bardstown Road intersection at Thixton Lane to include a right turn lane on Thixton Lane. The results are listed in Table 3.

**Table 3. Bardstown Road at Thixton Lane with a right turn lane on Thixton Lane**

|                                       | A.M.              |                                   | P.M.              |                                   |
|---------------------------------------|-------------------|-----------------------------------|-------------------|-----------------------------------|
| Approach                              | 2027<br>Build     | 2027<br>Build<br>Thixton Ln Right | 2027<br>Build     | 2027<br>Build<br>Thixton Ln Right |
| <b>Bardstown Road at Thixton Lane</b> | <b>B<br/>16.7</b> | <b>B<br/>11.5</b>                 | <b>D<br/>48.3</b> | <b>C<br/>24.7</b>                 |
| Thixton Lane Eastbound                | E<br>72.2         | D<br>51.3                         | E<br>66.6         | E<br>63.6                         |
| Bardstown Road Northbound             | B<br>11.0         | A<br>7.3                          | B<br>21.2         | B<br>12.9                         |
| Bardstown Road Southbound             | B<br>14.3         | B<br>10.1                         | E<br>60.5         | C<br>24.2                         |

## CONCLUSIONS

Based upon the volume of traffic generated by the development and the amount of traffic forecasted for the year 2027, there will be a slight impact to the existing highway network. No improvements are required.



## **APPENDIX**



Oak Grove Subdivision  
Traffic Impact Study

Traffic Counts

Classified Turn Movement Count || All vehicles



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Jefferson County, KY

Site 4 of 4

Cedar Creek Rd (South)  
Cedar Creek Rd (North)  
Independence School Rd (West)  
Independence School Rd (East)

Date

Tuesday, August 24, 2021

Weather

Fair  
87°F

Lat/Long

38.104664°, -85.607391°

0700 - 0900 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound             |             |              |               |              | Southbound             |             |              |               |              | Eastbound                     |              |               |                |              | Westbound                     |              |               |                |              | Int<br>Total |
|----------------|------------------------|-------------|--------------|---------------|--------------|------------------------|-------------|--------------|---------------|--------------|-------------------------------|--------------|---------------|----------------|--------------|-------------------------------|--------------|---------------|----------------|--------------|--------------|
|                | Cedar Creek Rd (South) |             |              |               |              | Cedar Creek Rd (North) |             |              |               |              | Independence School Rd (West) |              |               |                |              | Independence School Rd (East) |              |               |                |              |              |
|                | Left<br>4.1            | Thru<br>4.2 | Right<br>4.3 | U-Turn<br>4.4 | App<br>Total | Left<br>4.5            | Thru<br>4.6 | Right<br>4.7 | U-Turn<br>4.8 | App<br>Total | Left<br>4.9                   | Thru<br>4.10 | Right<br>4.11 | U-Turn<br>4.12 | App<br>Total | Left<br>4.13                  | Thru<br>4.14 | Right<br>4.15 | U-Turn<br>4.16 | App<br>Total |              |
| 0700 - 0715    | 0                      | 5           | 3            | 0             | 8            | 1                      | 6           | 0            | 0             | 7            | 0                             | 1            | 3             | 0              | 4            | 21                            | 0            | 2             | 0              | 23           | 42           |
| 0715 - 0730    | 1                      | 2           | 3            | 0             | 6            | 1                      | 5           | 0            | 0             | 6            | 0                             | 0            | 1             | 0              | 1            | 22                            | 0            | 2             | 0              | 24           | 37           |
| 0730 - 0745    | 2                      | 7           | 3            | 0             | 12           | 0                      | 11          | 0            | 0             | 11           | 0                             | 0            | 3             | 0              | 3            | 46                            | 0            | 2             | 0              | 48           | 74           |
| 0745 - 0800    | 0                      | 3           | 7            | 0             | 10           | 0                      | 1           | 0            | 0             | 1            | 0                             | 0            | 0             | 0              | 0            | 16                            | 1            | 3             | 0              | 20           | 31           |
| Hourly Total   | 3                      | 17          | 16           | 0             | 36           | 2                      | 23          | 0            | 0             | 25           | 0                             | 1            | 7             | 0              | 8            | 105                           | 1            | 9             | 0              | 115          | 184          |
| 0800 - 0815    | 0                      | 5           | 6            | 0             | 11           | 3                      | 6           | 1            | 0             | 10           | 2                             | 0            | 2             | 0              | 4            | 19                            | 0            | 2             | 0              | 21           | 46           |
| 0815 - 0830    | 0                      | 6           | 8            | 0             | 14           | 0                      | 12          | 0            | 0             | 12           | 1                             | 0            | 1             | 0              | 2            | 12                            | 0            | 2             | 0              | 14           | 42           |
| 0830 - 0845    | 0                      | 7           | 5            | 0             | 12           | 0                      | 7           | 0            | 0             | 7            | 0                             | 0            | 0             | 0              | 0            | 7                             | 0            | 3             | 0              | 10           | 29           |
| 0845 - 0900    | 0                      | 2           | 9            | 0             | 11           | 1                      | 13          | 0            | 0             | 14           | 0                             | 0            | 2             | 0              | 2            | 9                             | 0            | 3             | 0              | 12           | 39           |
| Hourly Total   | 0                      | 20          | 28           | 0             | 48           | 4                      | 38          | 1            | 0             | 43           | 3                             | 0            | 5             | 0              | 8            | 47                            | 0            | 10            | 0              | 57           | 156          |
| Grand Total    | 3                      | 37          | 44           | 0             | 84           | 6                      | 61          | 1            | 0             | 68           | 3                             | 1            | 12            | 0              | 16           | 152                           | 1            | 19            | 0              | 172          | 340          |
| Approach %     | 3.57                   | 44.05       | 52.38        | 0.00          | -            | 8.82                   | 89.71       | 1.47         | 0.00          | -            | 18.75                         | 6.25         | 75.00         | 0.00           | -            | 88.37                         | 0.58         | 11.05         | 0.00           | -            | -            |
| Intersection % | 0.88                   | 10.88       | 12.94        | 0.00          | 24.71        | 1.76                   | 17.94       | 0.29         | 0.00          | 20.00        | 0.88                          | 0.29         | 3.53          | 0.00           | 4.71         | 44.71                         | 0.29         | 5.59          | 0.00           | 50.59        | -            |
| PHF            | 0.25                   | 0.75        | 0.75         | 0.00          | 0.84         | 0.25                   | 0.63        | 0.25         | 0.00          | 0.71         | 0.38                          | 0.00         | 0.50          | 0.00           | 0.56         | 0.51                          | 0.25         | 0.75          | 0.00           | 0.54         | 0.65         |

1600 - 1800 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound             |             |              |               |              | Southbound             |             |              |               |              | Eastbound                     |              |               |                |              | Westbound                     |              |               |                |              | Int<br>Total |
|----------------|------------------------|-------------|--------------|---------------|--------------|------------------------|-------------|--------------|---------------|--------------|-------------------------------|--------------|---------------|----------------|--------------|-------------------------------|--------------|---------------|----------------|--------------|--------------|
|                | Cedar Creek Rd (South) |             |              |               |              | Cedar Creek Rd (North) |             |              |               |              | Independence School Rd (West) |              |               |                |              | Independence School Rd (East) |              |               |                |              |              |
|                | Left<br>4.1            | Thru<br>4.2 | Right<br>4.3 | U-Turn<br>4.4 | App<br>Total | Left<br>4.5            | Thru<br>4.6 | Right<br>4.7 | U-Turn<br>4.8 | App<br>Total | Left<br>4.9                   | Thru<br>4.10 | Right<br>4.11 | U-Turn<br>4.12 | App<br>Total | Left<br>4.13                  | Thru<br>4.14 | Right<br>4.15 | U-Turn<br>4.16 | App<br>Total |              |
| 1600 - 1615    | 3                      | 6           | 26           | 0             | 35           | 3                      | 10          | 2            | 0             | 15           | 0                             | 0            | 1             | 0              | 1            | 15                            | 0            | 2             | 0              | 17           | 68           |
| 1615 - 1630    | 3                      | 11          | 25           | 0             | 39           | 3                      | 7           | 0            | 0             | 10           | 0                             | 0            | 0             | 0              | 0            | 6                             | 1            | 3             | 0              | 10           | 59           |
| 1630 - 1645    | 1                      | 17          | 50           | 0             | 68           | 3                      | 19          | 2            | 0             | 24           | 1                             | 0            | 1             | 0              | 2            | 12                            | 0            | 4             | 0              | 16           | 110          |
| 1645 - 1700    | 1                      | 6           | 35           | 0             | 42           | 2                      | 6           | 0            | 0             | 8            | 1                             | 0            | 1             | 0              | 2            | 10                            | 1            | 4             | 0              | 15           | 67           |
| Hourly Total   | 8                      | 40          | 136          | 0             | 184          | 11                     | 42          | 4            | 0             | 57           | 2                             | 0            | 3             | 0              | 5            | 43                            | 2            | 13            | 0              | 58           | 304          |
| 1700 - 1715    | 5                      | 20          | 37           | 0             | 62           | 4                      | 8           | 0            | 0             | 12           | 0                             | 0            | 5             | 0              | 5            | 6                             | 1            | 1             | 0              | 8            | 87           |
| 1715 - 1730    | 3                      | 14          | 30           | 0             | 47           | 4                      | 6           | 0            | 0             | 10           | 0                             | 0            | 0             | 0              | 0            | 3                             | 0            | 0             | 0              | 3            | 60           |
| 1730 - 1745    | 2                      | 8           | 22           | 0             | 32           | 2                      | 7           | 2            | 0             | 11           | 1                             | 0            | 4             | 0              | 5            | 7                             | 0            | 4             | 0              | 11           | 59           |
| 1745 - 1800    | 4                      | 4           | 17           | 0             | 25           | 1                      | 7           | 1            | 0             | 9            | 3                             | 0            | 2             | 0              | 5            | 5                             | 0            | 2             | 0              | 7            | 46           |
| Hourly Total   | 14                     | 46          | 106          | 0             | 166          | 11                     | 28          | 3            | 0             | 42           | 4                             | 0            | 11            | 0              | 15           | 21                            | 1            | 7             | 0              | 29           | 252          |
| Grand Total    | 22                     | 86          | 242          | 0             | 350          | 22                     | 70          | 7            | 0             | 99           | 6                             | 0            | 14            | 0              | 20           | 64                            | 3            | 20            | 0              | 87           | 556          |
| Approach %     | 6.29                   | 24.57       | 69.14        | 0.00          | -            | 22.22                  | 70.71       | 7.07         | 0.00          | -            | 30.00                         | 0.00         | 70.00         | 0.00           | -            | 73.56                         | 3.45         | 22.99         | 0.00           | -            | -            |
| Intersection % | 3.96                   | 15.47       | 43.53        | 0.00          | 62.95        | 3.96                   | 12.59       | 1.26         | 0.00          | 17.81        | 1.08                          | 0.00         | 2.52          | 0.00           | 3.60         | 11.51                         | 0.54         | 3.60          | 0.00           | 15.65        | -            |
| PHF            | 0.50                   | 0.71        | 0.76         | 0.00          | 0.81         | 0.81                   | 0.51        | 0.25         | 0.00          | 0.56         | 0.50                          | 0.00         | 0.35          | 0.00           | 0.45         | 0.65                          | 0.50         | 0.56          | 0.00           | 0.66         | 0.74         |



# Oak Grove Subdivision Traffic Impact Study

## Classified Turn Movement Count || All vehicles

Jefferson County, KY



**Marr Traffic**  
DATA COLLECTION

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### Site 2 of 4

KY-2053 Thixton Ln (South)  
Oak Grove Rd

### Date

Tuesday, August 24, 2021

### Weather

Fair  
87°F

### Lat/Long

38.09235°, -85.593529°

### 0700 - 0900 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound<br>KY-2053 Thixton Ln (South) |              |               |              | Southbound<br>Oak Grove Rd |             |               |              |
|----------------|------------------------------------------|--------------|---------------|--------------|----------------------------|-------------|---------------|--------------|
|                | Thru<br>2.1                              | Right<br>2.2 | U-Turn<br>2.3 | App<br>Total | Left<br>2.4                | Thru<br>2.5 | U-Turn<br>2.6 | App<br>Total |
| 0700 - 0715    | 4                                        | 26           | 0             | 30           | 0                          | 3           | 0             | 3            |
| 0715 - 0730    | 6                                        | 29           | 0             | 35           | 0                          | 5           | 0             | 5            |
| 0730 - 0745    | 6                                        | 18           | 0             | 24           | 1                          | 1           | 0             | 2            |
| 0745 - 0800    | 6                                        | 18           | 0             | 24           | 1                          | 4           | 0             | 5            |
| Hourly Total   | 22                                       | 91           | 0             | 113          | 2                          | 13          | 0             | 15           |
| 0800 - 0815    | 6                                        | 24           | 0             | 30           | 1                          | 2           | 0             | 3            |
| 0815 - 0830    | 2                                        | 18           | 0             | 20           | 1                          | 3           | 0             | 4            |
| 0830 - 0845    | 3                                        | 22           | 0             | 25           | 0                          | 2           | 0             | 2            |
| 0845 - 0900    | 1                                        | 20           | 0             | 21           | 1                          | 3           | 0             | 4            |
| Hourly Total   | 12                                       | 84           | 0             | 96           | 3                          | 10          | 0             | 13           |
| Grand Total    | 34                                       | 175          | 0             | 209          | 5                          | 23          | 0             | 28           |
| Approach %     | 16.27                                    | 83.73        | 0.00          | -            | 17.86                      | 82.14       | 0.00          | -            |
| Intersection % | 8.81                                     | 45.34        | 0.00          | 54.15        | 1.30                       | 5.96        | 0.00          | 7.25         |
| PHF            | 1.00                                     | 0.77         | 0.00          | 0.81         | 0.75                       | 0.60        | 0.00          | 0.75         |

| Westbound<br>KY-2053 Thixton Ln (East) |              |               |              |              |
|----------------------------------------|--------------|---------------|--------------|--------------|
| Left<br>2.7                            | Right<br>2.8 | U-Turn<br>2.9 | App<br>Total | Int<br>Total |
| 13                                     | 2            | 0             | 15           | 48           |
| 14                                     | 1            | 0             | 15           | 55           |
| 30                                     | 2            | 0             | 32           | 58           |
| 20                                     | 2            | 0             | 22           | 51           |
| 77                                     | 7            | 0             | 84           | 212          |
| 26                                     | 0            | 0             | 26           | 59           |
| 16                                     | 2            | 0             | 18           | 42           |
| 8                                      | 0            | 0             | 8            | 35           |
| 12                                     | 1            | 0             | 13           | 38           |
| 62                                     | 3            | 0             | 65           | 174          |
| 139                                    | 10           | 0             | 149          | 386          |
| 93.29                                  | 6.71         | 0.00          | -            |              |
| 36.01                                  | 2.59         | 0.00          | 38.60        |              |
| 0.75                                   | 0.63         | 0.00          | 0.74         | 0.94         |

### 1600 - 1800 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound<br>KY-2053 Thixton Ln (South) |              |               |              | Southbound<br>Oak Grove Rd |             |               |              |
|----------------|------------------------------------------|--------------|---------------|--------------|----------------------------|-------------|---------------|--------------|
|                | Thru<br>2.1                              | Right<br>2.2 | U-Turn<br>2.3 | App<br>Total | Left<br>2.4                | Thru<br>2.5 | U-Turn<br>2.6 | App<br>Total |
| 1600 - 1615    | 3                                        | 29           | 0             | 32           | 3                          | 6           | 0             | 9            |
| 1615 - 1630    | 1                                        | 24           | 0             | 25           | 2                          | 8           | 0             | 10           |
| 1630 - 1645    | 6                                        | 43           | 0             | 49           | 3                          | 5           | 0             | 8            |
| 1645 - 1700    | 1                                        | 45           | 0             | 46           | 1                          | 1           | 0             | 2            |
| Hourly Total   | 11                                       | 141          | 0             | 152          | 9                          | 20          | 0             | 29           |
| 1700 - 1715    | 1                                        | 37           | 0             | 38           | 2                          | 7           | 0             | 9            |
| 1715 - 1730    | 1                                        | 32           | 0             | 33           | 0                          | 6           | 0             | 6            |
| 1730 - 1745    | 3                                        | 29           | 0             | 32           | 3                          | 6           | 0             | 9            |
| 1745 - 1800    | 4                                        | 23           | 0             | 27           | 2                          | 5           | 0             | 7            |
| Hourly Total   | 9                                        | 121          | 0             | 130          | 7                          | 24          | 0             | 31           |
| Grand Total    | 20                                       | 262          | 0             | 282          | 16                         | 44          | 0             | 60           |
| Approach %     | 7.09                                     | 92.91        | 0.00          | -            | 26.67                      | 73.33       | 0.00          | -            |
| Intersection % | 3.44                                     | 45.09        | 0.00          | 48.54        | 2.75                       | 7.57        | 0.00          | 10.33        |
| PHF            | 0.38                                     | 0.87         | 0.00          | 0.85         | 0.50                       | 0.68        | 0.00          | 0.69         |

| Westbound<br>KY-2053 Thixton Ln (East) |              |               |              |              |
|----------------------------------------|--------------|---------------|--------------|--------------|
| Left<br>2.7                            | Right<br>2.8 | U-Turn<br>2.9 | App<br>Total | Int<br>Total |
| 22                                     | 1            | 0             | 23           | 64           |
| 18                                     | 0            | 0             | 18           | 53           |
| 30                                     | 2            | 0             | 32           | 89           |
| 38                                     | 2            | 0             | 40           | 88           |
| 108                                    | 5            | 0             | 113          | 294          |
| 32                                     | 3            | 0             | 35           | 82           |
| 29                                     | 0            | 0             | 29           | 68           |
| 32                                     | 0            | 0             | 32           | 73           |
| 30                                     | 0            | 0             | 30           | 64           |
| 123                                    | 3            | 0             | 126          | 287          |
| 231                                    | 8            | 0             | 239          | 581          |
| 96.65                                  | 3.35         | 0.00          | -            |              |
| 39.76                                  | 1.38         | 0.00          | 41.14        |              |
| 0.85                                   | 0.58         | 0.00          | 0.85         | 0.92         |



# Oak Grove Subdivision Traffic Impact Study

## Classified Turn Movement Count | All vehicles

Jefferson County, KY



**Marr Traffic**  
DATA COLLECTION

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### Site 3 of 4

KY-2053 Thixton Ln (South)  
Pebble Trace

KY-2053 Thixton Ln (East)

### Date

Tuesday, August 24, 2021

### Lat/Long

38.089712°, -85.598788°

### Weather

Fair  
87°F

### 0700 - 0900 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound<br>KY-2053 Thixton Ln (South) |              |               |              | Southbound<br>Pebble Trace |             |               |              |
|----------------|------------------------------------------|--------------|---------------|--------------|----------------------------|-------------|---------------|--------------|
|                | Thru<br>3.1                              | Right<br>3.2 | U-Turn<br>3.3 | App<br>Total | Left<br>3.4                | Thru<br>3.5 | U-Turn<br>3.6 | App<br>Total |
| 0700 - 0715    | 0                                        | 20           | 0             | 20           | 11                         | 5           | 0             | 16           |
| 0715 - 0730    | 1                                        | 18           | 0             | 19           | 11                         | 6           | 0             | 17           |
| 0730 - 0745    | 4                                        | 17           | 0             | 21           | 8                          | 6           | 0             | 14           |
| 0745 - 0800    | 2                                        | 19           | 0             | 21           | 6                          | 6           | 0             | 12           |
| Hourly Total   | 7                                        | 74           | 0             | 81           | 36                         | 23          | 0             | 59           |
| 0800 - 0815    | 3                                        | 20           | 0             | 23           | 10                         | 8           | 0             | 18           |
| 0815 - 0830    | 1                                        | 14           | 0             | 15           | 8                          | 10          | 0             | 18           |
| 0830 - 0845    | 0                                        | 17           | 0             | 17           | 6                          | 2           | 0             | 8            |
| 0845 - 0900    | 0                                        | 15           | 0             | 15           | 4                          | 2           | 0             | 6            |
| Hourly Total   | 4                                        | 66           | 0             | 70           | 28                         | 22          | 0             | 50           |
| Grand Total    | 11                                       | 140          | 0             | 151          | 64                         | 45          | 0             | 109          |
| Approach %     | 7.28                                     | 92.72        | 0.00          | -            | 58.72                      | 41.28       | 0.00          | -            |
| Intersection % | 2.61                                     | 33.18        | 0.00          | 35.78        | 15.17                      | 10.66       | 0.00          | 25.83        |
| PHF            | 0.63                                     | 0.93         | 0.00          | 0.91         | 0.80                       | 0.81        | 0.00          | 0.85         |

| Westbound<br>KY-2053 Thixton Ln (East) |              |               |              |              |
|----------------------------------------|--------------|---------------|--------------|--------------|
| Left<br>3.7                            | Right<br>3.8 | U-Turn<br>3.9 | App<br>Total | Int<br>Total |
| 12                                     | 2            | 0             | 14           | 50           |
| 12                                     | 5            | 0             | 17           | 53           |
| 32                                     | 2            | 0             | 34           | 69           |
| 20                                     | 4            | 0             | 24           | 57           |
| 76                                     | 13           | 0             | 89           | 229          |
| 24                                     | 4            | 0             | 28           | 69           |
| 17                                     | 3            | 0             | 20           | 53           |
| 6                                      | 3            | 0             | 9            | 34           |
| 14                                     | 2            | 0             | 16           | 37           |
| 61                                     | 12           | 0             | 73           | 193          |
| 137                                    | 25           | 0             | 162          | 422          |
| 84.57                                  | 15.43        | 0.00          | -            |              |
| 32.46                                  | 5.92         | 0.00          | 38.39        |              |
| 0.69                                   | 0.75         | 0.00          | 0.76         | 0.90         |

### 1600 - 1800 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound<br>KY-2053 Thixton Ln (South) |              |               |              | Southbound<br>Pebble Trace |             |               |              |
|----------------|------------------------------------------|--------------|---------------|--------------|----------------------------|-------------|---------------|--------------|
|                | Thru<br>3.1                              | Right<br>3.2 | U-Turn<br>3.3 | App<br>Total | Left<br>3.4                | Thru<br>3.5 | U-Turn<br>3.6 | App<br>Total |
| 1600 - 1615    | 1                                        | 25           | 0             | 26           | 6                          | 1           | 0             | 7            |
| 1615 - 1630    | 3                                        | 23           | 0             | 26           | 4                          | 4           | 0             | 8            |
| 1630 - 1645    | 7                                        | 44           | 0             | 51           | 5                          | 2           | 0             | 7            |
| 1645 - 1700    | 4                                        | 38           | 0             | 42           | 5                          | 2           | 0             | 7            |
| Hourly Total   | 15                                       | 130          | 0             | 145          | 20                         | 9           | 0             | 29           |
| 1700 - 1715    | 4                                        | 33           | 0             | 37           | 4                          | 2           | 0             | 6            |
| 1715 - 1730    | 7                                        | 29           | 0             | 36           | 5                          | 3           | 0             | 8            |
| 1730 - 1745    | 8                                        | 29           | 0             | 37           | 4                          | 2           | 0             | 6            |
| 1745 - 1800    | 9                                        | 22           | 0             | 31           | 5                          | 2           | 0             | 7            |
| Hourly Total   | 28                                       | 113          | 0             | 141          | 18                         | 9           | 0             | 27           |
| Grand Total    | 43                                       | 243          | 0             | 286          | 38                         | 18          | 0             | 56           |
| Approach %     | 15.03                                    | 84.97        | 0.00          | -            | 67.86                      | 32.14       | 0.00          | -            |
| Intersection % | 6.97                                     | 39.38        | 0.00          | 46.35        | 6.16                       | 2.92        | 0.00          | 9.08         |
| PHF            | 0.79                                     | 0.82         | 0.00          | 0.81         | 0.95                       | 0.75        | 0.00          | 0.88         |

| Westbound<br>KY-2053 Thixton Ln (East) |              |               |              |              |
|----------------------------------------|--------------|---------------|--------------|--------------|
| Left<br>3.7                            | Right<br>3.8 | U-Turn<br>3.9 | App<br>Total | Int<br>Total |
| 20                                     | 9            | 0             | 29           | 62           |
| 18                                     | 7            | 0             | 25           | 59           |
| 30                                     | 5            | 0             | 35           | 93           |
| 24                                     | 9            | 0             | 33           | 82           |
| 92                                     | 30           | 0             | 122          | 296          |
| 29                                     | 15           | 0             | 44           | 87           |
| 31                                     | 5            | 0             | 36           | 80           |
| 21                                     | 17           | 0             | 38           | 81           |
| 26                                     | 9            | 0             | 35           | 73           |
| 107                                    | 46           | 0             | 153          | 321          |
| 199                                    | 76           | 0             | 275          | 617          |
| 72.36                                  | 27.64        | 0.00          | -            |              |
| 32.25                                  | 12.32        | 0.00          | 44.57        |              |
| 0.92                                   | 0.57         | 0.00          | 0.84         | 0.92         |



# Oak Grove Subdivision Traffic Impact Study

## Classified Turn Movement Count || All vehicles

Jefferson County, KY



**Marr Traffic**  
DATA COLLECTION

www.marrtraffic.com

### Site 1 of 4

US-150 Bardstown Rd (South)  
US-150 Bardstown Rd (North)  
KY-2053 Thixton Ln

### Date

Tuesday, August 24, 2021

### Weather

Fair  
87°F

### Lat/Long

38.100655°, -85.565656°

### 0700 - 0900 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound                  |             |  |               |              | Southbound                  |              |               |              |             | Eastbound          |              |               |              |      | Int<br>Total |
|----------------|-----------------------------|-------------|--|---------------|--------------|-----------------------------|--------------|---------------|--------------|-------------|--------------------|--------------|---------------|--------------|------|--------------|
|                | US-150 Bardstown Rd (South) |             |  |               |              | US-150 Bardstown Rd (North) |              |               |              |             | KY-2053 Thixton Ln |              |               |              |      |              |
|                | Left<br>1.1                 | Thru<br>1.2 |  | U-Turn<br>1.3 | App<br>Total | Thru<br>1.4                 | Right<br>1.5 | U-Turn<br>1.6 | App<br>Total | Left<br>1.7 |                    | Right<br>1.8 | U-Turn<br>1.9 | App<br>Total |      |              |
| 0700 - 0715    | 40                          | 455         |  | 0             | 495          | 178                         | 8            | 0             | 186          | 28          |                    | 17           | 0             | 45           | 726  |              |
| 0715 - 0730    | 76                          | 459         |  | 0             | 535          | 157                         | 9            | 0             | 166          | 30          |                    | 9            | 0             | 39           | 740  |              |
| 0730 - 0745    | 75                          | 335         |  | 0             | 410          | 196                         | 26           | 0             | 222          | 25          |                    | 14           | 0             | 39           | 671  |              |
| 0745 - 0800    | 40                          | 338         |  | 0             | 378          | 227                         | 13           | 1             | 241          | 14          |                    | 13           | 0             | 27           | 646  |              |
| Hourly Total   | 231                         | 1587        |  | 0             | 1818         | 758                         | 56           | 1             | 815          | 97          |                    | 53           | 0             | 150          | 2783 |              |
| 0800 - 0815    | 20                          | 336         |  | 0             | 356          | 198                         | 27           | 0             | 225          | 29          |                    | 10           | 0             | 39           | 620  |              |
| 0815 - 0830    | 24                          | 351         |  | 0             | 375          | 194                         | 16           | 0             | 210          | 26          |                    | 10           | 0             | 36           | 621  |              |
| 0830 - 0845    | 17                          | 347         |  | 0             | 364          | 159                         | 8            | 0             | 167          | 34          |                    | 13           | 0             | 47           | 578  |              |
| 0845 - 0900    | 20                          | 308         |  | 0             | 328          | 169                         | 13           | 0             | 182          | 26          |                    | 13           | 0             | 39           | 549  |              |
| Hourly Total   | 81                          | 1342        |  | 0             | 1423         | 720                         | 64           | 0             | 784          | 115         |                    | 46           | 0             | 161          | 2368 |              |
| Grand Total    | 312                         | 2929        |  | 0             | 3241         | 1478                        | 120          | 1             | 1599         | 212         |                    | 99           | 0             | 311          | 5151 |              |
| Approach %     | 9.63                        | 90.37       |  | 0.00          | -            | 92.43                       | 7.50         | 0.06          | -            | 68.17       |                    | 31.83        | 0.00          | -            |      |              |
| Intersection % | 6.06                        | 56.86       |  | 0.00          | 62.92        | 28.69                       | 2.33         | 0.02          | 31.04        | 4.12        |                    | 1.92         | 0.00          | 6.04         |      |              |
| PHF            | 0.76                        | 0.86        |  | 0.00          | 0.85         | 0.83                        | 0.54         | 0.25          | 0.85         | 0.81        |                    | 0.78         | 0.00          | 0.83         | 0.94 |              |

### 1600 - 1800 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound                  |             |               |              | Southbound                  |              |               |              | Eastbound          |              |               |              | Int<br>Total |
|----------------|-----------------------------|-------------|---------------|--------------|-----------------------------|--------------|---------------|--------------|--------------------|--------------|---------------|--------------|--------------|
|                | US-150 Bardstown Rd (South) |             |               |              | US-150 Bardstown Rd (North) |              |               |              | KY-2053 Thixton Ln |              |               |              |              |
|                | Left<br>1.1                 | Thru<br>1.2 | U-Turn<br>1.3 | App<br>Total | Thru<br>1.4                 | Right<br>1.5 | U-Turn<br>1.6 | App<br>Total | Left<br>1.7        | Right<br>1.8 | U-Turn<br>1.9 | App<br>Total |              |
| 1600 - 1615    | 23                          | 274         | 0             | 297          | 375                         | 37           | 0             | 412          | 23                 | 50           | 0             | 73           | 782          |
| 1615 - 1630    | 18                          | 257         | 0             | 275          | 422                         | 44           | 0             | 466          | 18                 | 44           | 0             | 62           | 803          |
| 1630 - 1645    | 23                          | 258         | 0             | 281          | 426                         | 37           | 0             | 463          | 27                 | 58           | 0             | 85           | 829          |
| 1645 - 1700    | 34                          | 294         | 0             | 328          | 414                         | 40           | 0             | 454          | 35                 | 62           | 0             | 97           | 879          |
| Hourly Total   | 98                          | 1083        | 0             | 1181         | 1637                        | 158          | 0             | 1795         | 103                | 214          | 0             | 317          | 3293         |
| 1700 - 1715    | 22                          | 249         | 0             | 271          | 503                         | 32           | 0             | 535          | 22                 | 43           | 0             | 65           | 871          |
| 1715 - 1730    | 23                          | 240         | 0             | 263          | 441                         | 32           | 0             | 473          | 23                 | 58           | 0             | 81           | 817          |
| 1730 - 1745    | 18                          | 252         | 0             | 270          | 483                         | 33           | 0             | 516          | 26                 | 48           | 0             | 74           | 860          |
| 1745 - 1800    | 19                          | 251         | 0             | 270          | 463                         | 40           | 0             | 503          | 28                 | 34           | 0             | 62           | 835          |
| Hourly Total   | 82                          | 992         | 0             | 1074         | 1890                        | 137          | 0             | 2027         | 99                 | 183          | 0             | 282          | 3383         |
| Grand Total    | 180                         | 2075        | 0             | 2255         | 3527                        | 295          | 0             | 3822         | 202                | 397          | 0             | 599          | 6676         |
| Approach %     | 7.98                        | 92.02       | 0.00          | -            | 92.28                       | 7.72         | 0.00          | -            | 33.72              | 66.28        | 0.00          | -            |              |
| Intersection % | 2.70                        | 31.08       | 0.00          | 33.78        | 52.83                       | 4.42         | 0.00          | 57.25        | 3.03               | 5.95         | 0.00          | 8.97         |              |
| PHF            | 0.71                        | 0.88        | 0.00          | 0.86         | 0.92                        | 0.86         | 0.00          | 0.92         | 0.76               | 0.85         | 0.00          | 0.82         | 0.97         |



## HCS Reports

| HCS7 Two-Way Stop-Control Report                 |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
|--------------------------------------------------|---------------------------------------|------|------|------|-----------|------|------|----------------------------|---------------------------|------|-----|----|------------|------|-----|---|
| General Information                              |                                       |      |      |      |           |      |      | Site Information           |                           |      |     |    |            |      |     |   |
| Analyst                                          | DBZ                                   |      |      |      |           |      |      | Intersection               | Cedar Creek at Ind School |      |     |    |            |      |     |   |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |      |      |      |           |      |      | Jurisdiction               |                           |      |     |    |            |      |     |   |
| Date Performed                                   | 9/19/2021                             |      |      |      |           |      |      | East/West Street           | Independence School Road  |      |     |    |            |      |     |   |
| Analysis Year                                    | 2021                                  |      |      |      |           |      |      | North/South Street         | Cedar Creek Road          |      |     |    |            |      |     |   |
| Time Analyzed                                    | AM Peak                               |      |      |      |           |      |      | Peak Hour Factor           | 0.65                      |      |     |    |            |      |     |   |
| Intersection Orientation                         | North-South                           |      |      |      |           |      |      | Analysis Time Period (hrs) | 0.25                      |      |     |    |            |      |     |   |
| Project Description                              | Oak Grove                             |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Lanes</b>                                     |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <p>Major Street: North-South</p>                 |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Approach                                         | Eastbound                             |      |      |      | Westbound |      |      |                            | Northbound                |      |     |    | Southbound |      |     |   |
| Movement                                         | U                                     | L    | T    | R    | U         | L    | T    | R                          | U                         | L    | T   | R  | U          | L    | T   | R |
| Priority                                         |                                       | 10   | 11   | 12   |           | 7    | 8    | 9                          | 1U                        | 1    | 2   | 3  | 4U         | 4    | 5   | 6 |
| Number of Lanes                                  |                                       | 0    | 1    | 0    |           | 0    | 1    | 0                          | 0                         | 0    | 1   | 0  | 0          | 0    | 1   | 0 |
| Configuration                                    |                                       |      | LTR  |      |           |      | LTR  |                            |                           |      | LTR |    |            |      | LTR |   |
| Volume (veh/h)                                   |                                       | 3    | 0    | 6    |           | 93   | 1    | 9                          |                           | 2    | 21  | 24 |            | 3    | 30  | 1 |
| Percent Heavy Vehicles (%)                       |                                       | 0    | 0    | 0    |           | 1    | 0    | 0                          |                           | 0    |     |    |            | 33   |     |   |
| Proportion Time Blocked                          |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Percent Grade (%)                                | 0                                     |      |      |      | 0         |      |      |                            |                           |      |     |    |            |      |     |   |
| Right Turn Channelized                           |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Median Type   Storage                            | Undivided                             |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Critical and Follow-up Headways</b>           |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Base Critical Headway (sec)                      |                                       | 7.1  | 6.5  | 6.2  |           | 7.1  | 6.5  | 6.2                        |                           | 4.1  |     |    |            | 4.1  |     |   |
| Critical Headway (sec)                           |                                       | 7.10 | 6.50 | 6.20 |           | 7.11 | 6.50 | 6.20                       |                           | 4.10 |     |    |            | 4.43 |     |   |
| Base Follow-Up Headway (sec)                     |                                       | 3.5  | 4.0  | 3.3  |           | 3.5  | 4.0  | 3.3                        |                           | 2.2  |     |    |            | 2.2  |     |   |
| Follow-Up Headway (sec)                          |                                       | 3.50 | 4.00 | 3.30 |           | 3.51 | 4.00 | 3.30                       |                           | 2.20 |     |    |            | 2.50 |     |   |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Flow Rate, v (veh/h)                             |                                       |      | 14   |      |           |      | 158  |                            |                           | 3    |     |    |            | 5    |     |   |
| Capacity, c (veh/h)                              |                                       |      | 958  |      |           |      | 861  |                            |                           | 1573 |     |    |            | 1356 |     |   |
| v/c Ratio                                        |                                       |      | 0.01 |      |           |      | 0.18 |                            |                           | 0.00 |     |    |            | 0.00 |     |   |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |      | 0.0  |      |           |      | 0.7  |                            |                           | 0.0  |     |    |            | 0.0  |     |   |
| Control Delay (s/veh)                            |                                       |      | 8.8  |      |           |      | 10.1 |                            |                           | 7.3  |     |    |            | 7.7  |     |   |
| Level of Service (LOS)                           |                                       |      | A    |      |           |      | B    |                            |                           | A    |     |    |            | A    |     |   |
| Approach Delay (s/veh)                           | 8.8                                   |      |      |      | 10.1      |      |      |                            | 0.3                       |      |     |    | 0.7        |      |     |   |
| Approach LOS                                     | A                                     |      |      |      | B         |      |      |                            |                           |      |     |    |            |      |     |   |



| HCS7 Two-Way Stop-Control Report                 |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
|--------------------------------------------------|---------------------------------------|------|------|------|-----------|------|------|----------------------------|---------------------------|------|-----|----|------------|------|-----|---|
| General Information                              |                                       |      |      |      |           |      |      | Site Information           |                           |      |     |    |            |      |     |   |
| Analyst                                          | DBZ                                   |      |      |      |           |      |      | Intersection               | Cedar Creek at Ind School |      |     |    |            |      |     |   |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |      |      |      |           |      |      | Jurisdiction               |                           |      |     |    |            |      |     |   |
| Date Performed                                   | 9/19/2021                             |      |      |      |           |      |      | East/West Street           | Independence School Road  |      |     |    |            |      |     |   |
| Analysis Year                                    | 2027                                  |      |      |      |           |      |      | North/South Street         | Cedar Creek Road          |      |     |    |            |      |     |   |
| Time Analyzed                                    | AM Peak No Build                      |      |      |      |           |      |      | Peak Hour Factor           | 0.65                      |      |     |    |            |      |     |   |
| Intersection Orientation                         | North-South                           |      |      |      |           |      |      | Analysis Time Period (hrs) | 0.25                      |      |     |    |            |      |     |   |
| Project Description                              | Oak Grove                             |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Lanes</b>                                     |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <p>Major Street: North-South</p>                 |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Approach                                         | Eastbound                             |      |      |      | Westbound |      |      |                            | Northbound                |      |     |    | Southbound |      |     |   |
| Movement                                         | U                                     | L    | T    | R    | U         | L    | T    | R                          | U                         | L    | T   | R  | U          | L    | T   | R |
| Priority                                         |                                       | 10   | 11   | 12   |           | 7    | 8    | 9                          | 1U                        | 1    | 2   | 3  | 4U         | 4    | 5   | 6 |
| Number of Lanes                                  |                                       | 0    | 1    | 0    |           | 0    | 1    | 0                          | 0                         | 0    | 1   | 0  | 0          | 0    | 1   | 0 |
| Configuration                                    |                                       |      | LTR  |      |           |      | LTR  |                            |                           |      | LTR |    |            |      | LTR |   |
| Volume (veh/h)                                   |                                       | 3    | 0    | 6    |           | 105  | 1    | 10                         |                           | 2    | 24  | 27 |            | 3    | 34  | 1 |
| Percent Heavy Vehicles (%)                       |                                       | 0    | 0    | 0    |           | 1    | 0    | 0                          |                           | 0    |     |    |            | 33   |     |   |
| Proportion Time Blocked                          |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Percent Grade (%)                                | 0                                     |      |      |      | 0         |      |      |                            |                           |      |     |    |            |      |     |   |
| Right Turn Channelized                           |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Median Type   Storage                            | Undivided                             |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Critical and Follow-up Headways</b>           |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Base Critical Headway (sec)                      |                                       | 7.1  | 6.5  | 6.2  |           | 7.1  | 6.5  | 6.2                        |                           | 4.1  |     |    |            | 4.1  |     |   |
| Critical Headway (sec)                           |                                       | 7.10 | 6.50 | 6.20 |           | 7.11 | 6.50 | 6.20                       |                           | 4.10 |     |    |            | 4.43 |     |   |
| Base Follow-Up Headway (sec)                     |                                       | 3.5  | 4.0  | 3.3  |           | 3.5  | 4.0  | 3.3                        |                           | 2.2  |     |    |            | 2.2  |     |   |
| Follow-Up Headway (sec)                          |                                       | 3.50 | 4.00 | 3.30 |           | 3.51 | 4.00 | 3.30                       |                           | 2.20 |     |    |            | 2.50 |     |   |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Flow Rate, v (veh/h)                             |                                       |      | 14   |      |           |      | 178  |                            |                           | 3    |     |    |            | 5    |     |   |
| Capacity, c (veh/h)                              |                                       |      | 945  |      |           |      | 845  |                            |                           | 1564 |     |    |            | 1345 |     |   |
| v/c Ratio                                        |                                       |      | 0.01 |      |           |      | 0.21 |                            |                           | 0.00 |     |    |            | 0.00 |     |   |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |      | 0.0  |      |           |      | 0.8  |                            |                           | 0.0  |     |    |            | 0.0  |     |   |
| Control Delay (s/veh)                            |                                       |      | 8.9  |      |           |      | 10.4 |                            |                           | 7.3  |     |    |            | 7.7  |     |   |
| Level of Service (LOS)                           |                                       |      | A    |      |           |      | B    |                            |                           | A    |     |    |            | A    |     |   |
| Approach Delay (s/veh)                           | 8.9                                   |      |      |      | 10.4      |      |      |                            | 0.3                       |      |     |    | 0.6        |      |     |   |
| Approach LOS                                     | A                                     |      |      |      | B         |      |      |                            |                           |      |     |    |            |      |     |   |



Oak Grove Subdivision  
Traffic Impact Study

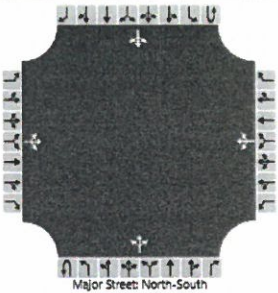
| HCS7 Two-Way Stop-Control Report                 |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
|--------------------------------------------------|---------------------------------------|------|------|------|-----------|------|------|----------------------------|---------------------------|------|-----|----|------------|------|-----|---|
| General Information                              |                                       |      |      |      |           |      |      | Site Information           |                           |      |     |    |            |      |     |   |
| Analyst                                          | DBZ                                   |      |      |      |           |      |      | Intersection               | Cedar Creek at Ind School |      |     |    |            |      |     |   |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |      |      |      |           |      |      | Jurisdiction               |                           |      |     |    |            |      |     |   |
| Date Performed                                   | 9/19/2021                             |      |      |      |           |      |      | East/West Street           | Independence School Road  |      |     |    |            |      |     |   |
| Analysis Year                                    | 2027                                  |      |      |      |           |      |      | North/South Street         | Cedar Creek Road          |      |     |    |            |      |     |   |
| Time Analyzed                                    | AM Peak Build                         |      |      |      |           |      |      | Peak Hour Factor           | 0.65                      |      |     |    |            |      |     |   |
| Intersection Orientation                         | North-South                           |      |      |      |           |      |      | Analysis Time Period (hrs) | 0.25                      |      |     |    |            |      |     |   |
| Project Description                              | Oak Grove                             |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Lanes</b>                                     |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <p>Major Street: North-South</p>                 |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Approach                                         | Eastbound                             |      |      |      | Westbound |      |      |                            | Northbound                |      |     |    | Southbound |      |     |   |
| Movement                                         | U                                     | L    | T    | R    | U         | L    | T    | R                          | U                         | L    | T   | R  | U          | L    | T   | R |
| Priority                                         |                                       | 10   | 11   | 12   |           | 7    | 8    | 9                          | 1U                        | 1    | 2   | 3  | 4U         | 4    | 5   | 6 |
| Number of Lanes                                  |                                       | 0    | 1    | 0    |           | 0    | 1    | 0                          | 0                         | 0    | 1   | 0  | 0          | 0    | 1   | 0 |
| Configuration                                    |                                       |      | LTR  |      |           |      | LTR  |                            |                           |      | LTR |    |            |      | LTR |   |
| Volume (veh/h)                                   |                                       | 3    | 0    | 6    |           | 131  | 1    | 13                         |                           | 2    | 24  | 36 |            | 4    | 34  | 1 |
| Percent Heavy Vehicles (%)                       |                                       | 0    | 0    | 0    |           | 1    | 0    | 0                          |                           | 0    |     |    |            | 25   |     |   |
| Proportion Time Blocked                          |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Percent Grade (%)                                | 0                                     |      |      |      | 0         |      |      |                            |                           |      |     |    |            |      |     |   |
| Right Turn Channelized                           |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Median Type   Storage                            | Undivided                             |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Critical and Follow-up Headways</b>           |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Base Critical Headway (sec)                      |                                       | 7.1  | 6.5  | 6.2  |           | 7.1  | 6.5  | 6.2                        |                           | 4.1  |     |    |            | 4.1  |     |   |
| Critical Headway (sec)                           |                                       | 7.10 | 6.50 | 6.20 |           | 7.11 | 6.50 | 6.20                       |                           | 4.10 |     |    |            | 4.35 |     |   |
| Base Follow-Up Headway (sec)                     |                                       | 3.5  | 4.0  | 3.3  |           | 3.5  | 4.0  | 3.3                        |                           | 2.2  |     |    |            | 2.2  |     |   |
| Follow-Up Headway (sec)                          |                                       | 3.50 | 4.00 | 3.30 |           | 3.51 | 4.00 | 3.30                       |                           | 2.20 |     |    |            | 2.43 |     |   |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Flow Rate, v (veh/h)                             |                                       |      | 14   |      |           |      | 223  |                            |                           | 3    |     |    |            | 6    |     |   |
| Capacity, c (veh/h)                              |                                       |      | 936  |      |           |      | 833  |                            |                           | 1564 |     |    |            | 1370 |     |   |
| v/c Ratio                                        |                                       |      | 0.01 |      |           |      | 0.27 |                            |                           | 0.00 |     |    |            | 0.00 |     |   |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |      | 0.0  |      |           |      | 1.1  |                            |                           | 0.0  |     |    |            | 0.0  |     |   |
| Control Delay (s/veh)                            |                                       |      | 8.9  |      |           |      | 10.9 |                            |                           | 7.3  |     |    |            | 7.6  |     |   |
| Level of Service (LOS)                           |                                       |      | A    |      |           |      | B    |                            |                           | A    |     |    |            | A    |     |   |
| Approach Delay (s/veh)                           | 8.9                                   |      |      |      | 10.9      |      |      |                            | 0.3                       |      |     |    | 0.8        |      |     |   |
| Approach LOS                                     | A                                     |      |      |      | B         |      |      |                            |                           |      |     |    |            |      |     |   |

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| HCS7 Two-Way Stop-Control Report                                                  |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
|-----------------------------------------------------------------------------------|---------------------------------------|------|------|------|-----------|------|------|----------------------------|---------------------------|------|-----|-----|------------|------|-----|---|
| General Information                                                               |                                       |      |      |      |           |      |      | Site Information           |                           |      |     |     |            |      |     |   |
| Analyst                                                                           | DBZ                                   |      |      |      |           |      |      | Intersection               | Cedar Creek at Ind School |      |     |     |            |      |     |   |
| Agency/Co.                                                                        | Diane B Zimmerman Traffic Engineering |      |      |      |           |      |      | Jurisdiction               |                           |      |     |     |            |      |     |   |
| Date Performed                                                                    | 9/19/2021                             |      |      |      |           |      |      | East/West Street           | Independence School Road  |      |     |     |            |      |     |   |
| Analysis Year                                                                     | 2021                                  |      |      |      |           |      |      | North/South Street         | Cedar Creek Road          |      |     |     |            |      |     |   |
| Time Analyzed                                                                     | PM Peak                               |      |      |      |           |      |      | Peak Hour Factor           | 0.74                      |      |     |     |            |      |     |   |
| Intersection Orientation                                                          | North-South                           |      |      |      |           |      |      | Analysis Time Period (hrs) | 0.25                      |      |     |     |            |      |     |   |
| Project Description                                                               | Oak Grove                             |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| <b>Lanes</b>                                                                      |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
|  |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| <b>Vehicle Volumes and Adjustments</b>                                            |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Approach                                                                          | Eastbound                             |      |      |      | Westbound |      |      |                            | Northbound                |      |     |     | Southbound |      |     |   |
| Movement                                                                          | U                                     | L    | T    | R    | U         | L    | T    | R                          | U                         | L    | T   | R   | U          | L    | T   | R |
| Priority                                                                          |                                       | 10   | 11   | 12   |           | 7    | 8    | 9                          | 1U                        | 1    | 2   | 3   | 4U         | 4    | 5   | 6 |
| Number of Lanes                                                                   |                                       | 0    | 1    | 0    |           | 0    | 1    | 0                          | 0                         | 0    | 1   | 0   | 0          | 0    | 1   | 0 |
| Configuration                                                                     |                                       |      | LTR  |      |           |      | LTR  |                            |                           |      | LTR |     |            |      | LTR |   |
| Volume (veh/h)                                                                    |                                       | 2    | 0    | 7    |           | 31   | 2    | 9                          |                           | 10   | 57  | 152 |            | 13   | 39  | 2 |
| Percent Heavy Vehicles (%)                                                        |                                       | 0    | 0    | 0    |           | 0    | 0    | 11                         |                           | 0    |     |     |            | 8    |     |   |
| Proportion Time Blocked                                                           |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Percent Grade (%)                                                                 | 0                                     |      |      |      | 0         |      |      |                            |                           |      |     |     |            |      |     |   |
| Right Turn Channelized                                                            |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Median Type   Storage                                                             | Undivided                             |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| <b>Critical and Follow-up Headways</b>                                            |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Base Critical Headway (sec)                                                       |                                       | 7.1  | 6.5  | 6.2  |           | 7.1  | 6.5  | 6.2                        |                           | 4.1  |     |     |            | 4.1  |     |   |
| Critical Headway (sec)                                                            |                                       | 7.10 | 6.50 | 6.20 |           | 7.10 | 6.50 | 6.31                       |                           | 4.10 |     |     |            | 4.18 |     |   |
| Base Follow-Up Headway (sec)                                                      |                                       | 3.5  | 4.0  | 3.3  |           | 3.5  | 4.0  | 3.3                        |                           | 2.2  |     |     |            | 2.2  |     |   |
| Follow-Up Headway (sec)                                                           |                                       | 3.50 | 4.00 | 3.30 |           | 3.50 | 4.00 | 3.40                       |                           | 2.20 |     |     |            | 2.27 |     |   |
| <b>Delay, Queue Length, and Level of Service</b>                                  |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Flow Rate, v (veh/h)                                                              |                                       |      | 12   |      |           |      | 57   |                            |                           | 14   |     |     |            | 18   |     |   |
| Capacity, c (veh/h)                                                               |                                       |      | 895  |      |           |      | 670  |                            |                           | 1562 |     |     |            | 1246 |     |   |
| v/c Ratio                                                                         |                                       |      | 0.01 |      |           |      | 0.08 |                            |                           | 0.01 |     |     |            | 0.01 |     |   |
| 95% Queue Length, Q <sub>95</sub> (veh)                                           |                                       |      | 0.0  |      |           |      | 0.3  |                            |                           | 0.0  |     |     |            | 0.0  |     |   |
| Control Delay (s/veh)                                                             |                                       |      | 9.1  |      |           |      | 10.9 |                            |                           | 7.3  |     |     |            | 7.9  |     |   |
| Level of Service (LOS)                                                            |                                       |      | A    |      |           |      | B    |                            |                           | A    |     |     |            | A    |     |   |
| Approach Delay (s/veh)                                                            | 9.1                                   |      |      |      | 10.9      |      |      |                            | 0.4                       |      |     |     | 2.0        |      |     |   |
| Approach LOS                                                                      | A                                     |      |      |      | B         |      |      |                            |                           |      |     |     |            |      |     |   |



Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Two-Way Stop-Control Report                 |                                       |      |      |      |           |           |      |                            |                           |      |     |     |            |      |     |   |  |  |  |
|--------------------------------------------------|---------------------------------------|------|------|------|-----------|-----------|------|----------------------------|---------------------------|------|-----|-----|------------|------|-----|---|--|--|--|
| General Information                              |                                       |      |      |      |           |           |      | Site Information           |                           |      |     |     |            |      |     |   |  |  |  |
| Analyst                                          | DBZ                                   |      |      |      |           |           |      | Intersection               | Cedar Creek at Ind School |      |     |     |            |      |     |   |  |  |  |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |      |      |      |           |           |      | Jurisdiction               |                           |      |     |     |            |      |     |   |  |  |  |
| Date Performed                                   | 9/19/2021                             |      |      |      |           |           |      | East/West Street           | Independence School Road  |      |     |     |            |      |     |   |  |  |  |
| Analysis Year                                    | 2027                                  |      |      |      |           |           |      | North/South Street         | Cedar Creek Road          |      |     |     |            |      |     |   |  |  |  |
| Time Analyzed                                    | PM Peak No Build                      |      |      |      |           |           |      | Peak Hour Factor           | 0.74                      |      |     |     |            |      |     |   |  |  |  |
| Intersection Orientation                         | North-South                           |      |      |      |           |           |      | Analysis Time Period (hrs) | 0.25                      |      |     |     |            |      |     |   |  |  |  |
| Project Description                              | Oak Grove                             |      |      |      |           |           |      |                            |                           |      |     |     |            |      |     |   |  |  |  |
| <b>Lanes</b>                                     |                                       |      |      |      |           |           |      |                            |                           |      |     |     |            |      |     |   |  |  |  |
| <p>Major Street: North-South</p>                 |                                       |      |      |      |           |           |      |                            |                           |      |     |     |            |      |     |   |  |  |  |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |      |      |      |           |           |      |                            |                           |      |     |     |            |      |     |   |  |  |  |
| Approach                                         | Eastbound                             |      |      |      | Westbound |           |      |                            | Northbound                |      |     |     | Southbound |      |     |   |  |  |  |
| Movement                                         | U                                     | L    | T    | R    | U         | L         | T    | R                          | U                         | L    | T   | R   | U          | L    | T   | R |  |  |  |
| Priority                                         |                                       | 10   | 11   | 12   |           | 7         | 8    | 9                          | 1U                        | 1    | 2   | 3   | 4U         | 4    | 5   | 6 |  |  |  |
| Number of Lanes                                  |                                       | 0    | 1    | 0    |           | 0         | 1    | 0                          | 0                         | 0    | 1   | 0   | 0          | 0    | 1   | 0 |  |  |  |
| Configuration                                    |                                       |      | LTR  |      |           |           | LTR  |                            |                           |      | LTR |     |            |      | LTR |   |  |  |  |
| Volume (veh/h)                                   |                                       | 2    | 0    | 7    |           | 35        | 2    | 10                         |                           | 10   | 64  | 171 |            | 15   | 44  | 2 |  |  |  |
| Percent Heavy Vehicles (%)                       |                                       | 0    | 0    | 0    |           | 0         | 0    | 11                         |                           | 0    |     |     |            | 8    |     |   |  |  |  |
| Proportion Time Blocked                          |                                       |      |      |      |           |           |      |                            |                           |      |     |     |            |      |     |   |  |  |  |
| Percent Grade (%)                                |                                       | 0    |      |      |           | 0         |      |                            |                           |      |     |     |            |      |     |   |  |  |  |
| Right Turn Channelized                           |                                       |      |      |      |           |           |      |                            |                           |      |     |     |            |      |     |   |  |  |  |
| Median Type   Storage                            |                                       |      |      |      |           | Undivided |      |                            |                           |      |     |     |            |      |     |   |  |  |  |
| <b>Critical and Follow-up Headways</b>           |                                       |      |      |      |           |           |      |                            |                           |      |     |     |            |      |     |   |  |  |  |
| Base Critical Headway (sec)                      |                                       | 7.1  | 6.5  | 6.2  |           | 7.1       | 6.5  | 6.2                        |                           | 4.1  |     |     |            | 4.1  |     |   |  |  |  |
| Critical Headway (sec)                           |                                       | 7.10 | 6.50 | 6.20 |           | 7.10      | 6.50 | 6.31                       |                           | 4.10 |     |     |            | 4.18 |     |   |  |  |  |
| Base Follow-Up Headway (sec)                     |                                       | 3.5  | 4.0  | 3.3  |           | 3.5       | 4.0  | 3.3                        |                           | 2.2  |     |     |            | 2.2  |     |   |  |  |  |
| Follow-Up Headway (sec)                          |                                       | 3.50 | 4.00 | 3.30 |           | 3.50      | 4.00 | 3.40                       |                           | 2.20 |     |     |            | 2.27 |     |   |  |  |  |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |      |      |      |           |           |      |                            |                           |      |     |     |            |      |     |   |  |  |  |
| Flow Rate, v (veh/h)                             |                                       |      | 12   |      |           |           | 64   |                            |                           | 14   |     |     |            | 20   |     |   |  |  |  |
| Capacity, c (veh/h)                              |                                       |      | 874  |      |           |           | 637  |                            |                           | 1554 |     |     |            | 1209 |     |   |  |  |  |
| v/c Ratio                                        |                                       |      | 0.01 |      |           |           | 0.10 |                            |                           | 0.01 |     |     |            | 0.02 |     |   |  |  |  |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |      | 0.0  |      |           |           | 0.3  |                            |                           | 0.0  |     |     |            | 0.1  |     |   |  |  |  |
| Control Delay (s/veh)                            |                                       |      | 9.2  |      |           |           | 11.3 |                            |                           | 7.3  |     |     |            | 8.0  |     |   |  |  |  |
| Level of Service (LOS)                           |                                       |      | A    |      |           |           | B    |                            |                           | A    |     |     |            | A    |     |   |  |  |  |
| Approach Delay (s/veh)                           |                                       | 9.2  |      |      |           | 11.3      |      |                            |                           |      | 0.4 |     |            |      | 2.1 |   |  |  |  |
| Approach LOS                                     |                                       | A    |      |      |           | B         |      |                            |                           |      |     |     |            |      |     |   |  |  |  |

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| HCS7 Two-Way Stop-Control Report                 |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
|--------------------------------------------------|---------------------------------------|------|------|------|-----------|------|------|----------------------------|---------------------------|------|-----|-----|------------|------|-----|---|
| General Information                              |                                       |      |      |      |           |      |      | Site Information           |                           |      |     |     |            |      |     |   |
| Analyst                                          | DBZ                                   |      |      |      |           |      |      | Intersection               | Cedar Creek at Ind School |      |     |     |            |      |     |   |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |      |      |      |           |      |      | Jurisdiction               |                           |      |     |     |            |      |     |   |
| Date Performed                                   | 9/19/2021                             |      |      |      |           |      |      | East/West Street           | Independence School Road  |      |     |     |            |      |     |   |
| Analysis Year                                    | 2027                                  |      |      |      |           |      |      | North/South Street         | Cedar Creek Road          |      |     |     |            |      |     |   |
| Time Analyzed                                    | PM Peak Build                         |      |      |      |           |      |      | Peak Hour Factor           | 0.74                      |      |     |     |            |      |     |   |
| Intersection Orientation                         | North-South                           |      |      |      |           |      |      | Analysis Time Period (hrs) | 0.25                      |      |     |     |            |      |     |   |
| Project Description                              | Oak Grove                             |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| <b>Lanes</b>                                     |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| <p>Major Street: North-South</p>                 |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Approach                                         | Eastbound                             |      |      |      | Westbound |      |      |                            | Northbound                |      |     |     | Southbound |      |     |   |
| Movement                                         | U                                     | L    | T    | R    | U         | L    | T    | R                          | U                         | L    | T   | R   | U          | L    | T   | R |
| Priority                                         |                                       | 10   | 11   | 12   |           | 7    | 8    | 9                          | 1U                        | 1    | 2   | 3   | 4U         | 4    | 5   | 6 |
| Number of Lanes                                  |                                       | 0    | 1    | 0    |           | 0    | 1    | 0                          | 0                         | 0    | 1   | 0   | 0          | 0    | 1   | 0 |
| Configuration                                    |                                       |      | LTR  |      |           |      | LTR  |                            |                           |      | LTR |     |            |      | LTR |   |
| Volume (veh/h)                                   |                                       | 2    | 0    | 7    |           | 50   | 2    | 14                         |                           | 10   | 64  | 200 |            | 18   | 44  | 2 |
| Percent Heavy Vehicles (%)                       |                                       | 0    | 0    | 0    |           | 0    | 0    | 11                         |                           | 0    |     |     |            | 8    |     |   |
| Proportion Time Blocked                          |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Percent Grade (%)                                | 0                                     |      |      |      | 0         |      |      |                            |                           |      |     |     |            |      |     |   |
| Right Turn Channelized                           |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Median Type   Storage                            | Undivided                             |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| <b>Critical and Follow-up Headways</b>           |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Base Critical Headway (sec)                      |                                       | 7.1  | 6.5  | 6.2  |           | 7.1  | 6.5  | 6.2                        |                           | 4.1  |     |     |            | 4.1  |     |   |
| Critical Headway (sec)                           |                                       | 7.10 | 6.50 | 6.20 |           | 7.10 | 6.50 | 6.31                       |                           | 4.10 |     |     |            | 4.18 |     |   |
| Base Follow-Up Headway (sec)                     |                                       | 3.5  | 4.0  | 3.3  |           | 3.5  | 4.0  | 3.3                        |                           | 2.2  |     |     |            | 2.2  |     |   |
| Follow-Up Headway (sec)                          |                                       | 3.50 | 4.00 | 3.30 |           | 3.50 | 4.00 | 3.40                       |                           | 2.20 |     |     |            | 2.27 |     |   |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Flow Rate, v (veh/h)                             |                                       |      | 12   |      |           |      | 89   |                            |                           | 14   |     |     |            | 24   |     |   |
| Capacity, c (veh/h)                              |                                       |      | 857  |      |           |      | 611  |                            |                           | 1554 |     |     |            | 1169 |     |   |
| v/c Ratio                                        |                                       |      | 0.01 |      |           |      | 0.15 |                            |                           | 0.01 |     |     |            | 0.02 |     |   |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |      | 0.0  |      |           |      | 0.5  |                            |                           | 0.0  |     |     |            | 0.1  |     |   |
| Control Delay (s/veh)                            |                                       |      | 9.3  |      |           |      | 11.9 |                            |                           | 7.3  |     |     |            | 8.1  |     |   |
| Level of Service (LOS)                           |                                       |      | A    |      |           |      | B    |                            |                           | A    |     |     |            | A    |     |   |
| Approach Delay (s/veh)                           | 9.3                                   |      |      |      | 11.9      |      |      |                            | 0.3                       |      |     |     | 2.4        |      |     |   |
| Approach LOS                                     | A                                     |      |      |      | B         |      |      |                            |                           |      |     |     |            |      |     |   |



Oak Grove Subdivision  
Traffic Impact Study

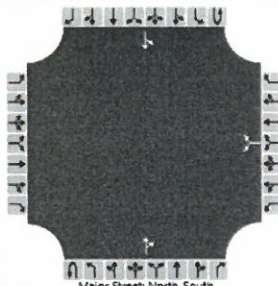
| HCS7 Two-Way Stop-Control Report                 |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
|--------------------------------------------------|---------------------------------------|----|----|----|-----------|------|----|----------------------------|----------------------|---|----|----|------------|------|----|---|
| General Information                              |                                       |    |    |    |           |      |    | Site Information           |                      |   |    |    |            |      |    |   |
| Analyst                                          | DBZ                                   |    |    |    |           |      |    | Intersection               | Thixton at Oak Grove |   |    |    |            |      |    |   |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |    |    |    |           |      |    | Jurisdiction               |                      |   |    |    |            |      |    |   |
| Date Performed                                   | 9/19/2021                             |    |    |    |           |      |    | East/West Street           | Thixton              |   |    |    |            |      |    |   |
| Analysis Year                                    | 2021                                  |    |    |    |           |      |    | North/South Street         | Oak Grove/Thixton    |   |    |    |            |      |    |   |
| Time Analyzed                                    | AM Peak                               |    |    |    |           |      |    | Peak Hour Factor           | 0.94                 |   |    |    |            |      |    |   |
| Intersection Orientation                         | North-South                           |    |    |    |           |      |    | Analysis Time Period (hrs) | 0.25                 |   |    |    |            |      |    |   |
| Project Description                              | Oak Grove                             |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| <b>Lanes</b>                                     |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
|                                                  |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| Approach                                         | Eastbound                             |    |    |    | Westbound |      |    |                            | Northbound           |   |    |    | Southbound |      |    |   |
| Movement                                         | U                                     | L  | T  | R  | U         | L    | T  | R                          | U                    | L | T  | R  | U          | L    | T  | R |
| Priority                                         |                                       | 10 | 11 | 12 |           | 7    | 8  | 9                          | 1U                   | 1 | 2  | 3  | 4U         | 4    | 5  | 6 |
| Number of Lanes                                  |                                       | 0  | 0  | 0  |           | 0    | 1  | 0                          | 0                    | 0 | 1  | 0  | 0          | 0    | 1  | 0 |
| Configuration                                    |                                       |    |    |    |           |      | LR |                            |                      |   |    | TR |            | LT   |    |   |
| Volume (veh/h)                                   |                                       |    |    |    |           | 90   |    | 5                          |                      |   | 24 | 89 |            | 3    | 12 |   |
| Percent Heavy Vehicles (%)                       |                                       |    |    |    |           | 6    |    | 0                          |                      |   |    |    |            | 67   |    |   |
| Proportion Time Blocked                          |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| Percent Grade (%)                                | 0                                     |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| Right Turn Channelized                           |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| Median Type   Storage                            | Undivided                             |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| <b>Critical and Follow-up Headways</b>           |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| Base Critical Headway (sec)                      |                                       |    |    |    |           | 7.1  |    | 6.2                        |                      |   |    |    |            | 4.1  |    |   |
| Critical Headway (sec)                           |                                       |    |    |    |           | 6.46 |    | 6.20                       |                      |   |    |    |            | 4.77 |    |   |
| Base Follow-Up Headway (sec)                     |                                       |    |    |    |           | 3.5  |    | 3.3                        |                      |   |    |    |            | 2.2  |    |   |
| Follow-Up Headway (sec)                          |                                       |    |    |    |           | 3.55 |    | 3.30                       |                      |   |    |    |            | 2.80 |    |   |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| Flow Rate, v (veh/h)                             |                                       |    |    |    |           | 101  |    |                            |                      |   |    |    |            | 3    |    |   |
| Capacity, c (veh/h)                              |                                       |    |    |    |           | 901  |    |                            |                      |   |    |    |            | 1147 |    |   |
| v/c Ratio                                        |                                       |    |    |    |           | 0.11 |    |                            |                      |   |    |    |            | 0.00 |    |   |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |    |    |    |           | 0.4  |    |                            |                      |   |    |    |            | 0.0  |    |   |
| Control Delay (s/veh)                            |                                       |    |    |    |           | 9.5  |    |                            |                      |   |    |    |            | 8.1  |    |   |
| Level of Service (LOS)                           |                                       |    |    |    |           | A    |    |                            |                      |   |    |    |            | A    |    |   |
| Approach Delay (s/veh)                           |                                       |    |    |    | 9.5       |      |    |                            |                      |   |    |    | 1.6        |      |    |   |
| Approach LOS                                     |                                       |    |    |    | A         |      |    |                            |                      |   |    |    |            |      |    |   |

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| HCS7 Two-Way Stop-Control Report                                                                                   |                                       |    |    |    |           |           |    |                            |                      |   |    |     |            |      |    |   |
|--------------------------------------------------------------------------------------------------------------------|---------------------------------------|----|----|----|-----------|-----------|----|----------------------------|----------------------|---|----|-----|------------|------|----|---|
| General Information                                                                                                |                                       |    |    |    |           |           |    | Site Information           |                      |   |    |     |            |      |    |   |
| Analyst                                                                                                            | DBZ                                   |    |    |    |           |           |    | Intersection               | Thixton at Oak Grove |   |    |     |            |      |    |   |
| Agency/Co.                                                                                                         | Diane B Zimmerman Traffic Engineering |    |    |    |           |           |    | Jurisdiction               |                      |   |    |     |            |      |    |   |
| Date Performed                                                                                                     | 9/19/2021                             |    |    |    |           |           |    | East/West Street           | Thixton              |   |    |     |            |      |    |   |
| Analysis Year                                                                                                      | 2027                                  |    |    |    |           |           |    | North/South Street         | Oak Grove/Thixton    |   |    |     |            |      |    |   |
| Time Analyzed                                                                                                      | AM Peak No Build                      |    |    |    |           |           |    | Peak Hour Factor           | 0.94                 |   |    |     |            |      |    |   |
| Intersection Orientation                                                                                           | North-South                           |    |    |    |           |           |    | Analysis Time Period (hrs) | 0.25                 |   |    |     |            |      |    |   |
| Project Description                                                                                                | Oak Grove                             |    |    |    |           |           |    |                            |                      |   |    |     |            |      |    |   |
| <b>Lanes</b>                                                                                                       |                                       |    |    |    |           |           |    |                            |                      |   |    |     |            |      |    |   |
|  <p>Major Street: North-South</p> |                                       |    |    |    |           |           |    |                            |                      |   |    |     |            |      |    |   |
| <b>Vehicle Volumes and Adjustments</b>                                                                             |                                       |    |    |    |           |           |    |                            |                      |   |    |     |            |      |    |   |
| Approach                                                                                                           | Eastbound                             |    |    |    | Westbound |           |    |                            | Northbound           |   |    |     | Southbound |      |    |   |
| Movement                                                                                                           | U                                     | L  | T  | R  | U         | L         | T  | R                          | U                    | L | T  | R   | U          | L    | T  | R |
| Priority                                                                                                           |                                       | 10 | 11 | 12 |           | 7         | 8  | 9                          | 1U                   | 1 | 2  | 3   | 4U         | 4    | 5  | 6 |
| Number of Lanes                                                                                                    |                                       | 0  | 0  | 0  |           | 0         | 1  | 0                          | 0                    | 0 | 1  | 0   | 0          | 0    | 1  | 0 |
| Configuration                                                                                                      |                                       |    |    |    |           |           | LR |                            |                      |   |    | TR  |            | LT   |    |   |
| Volume (veh/h)                                                                                                     |                                       |    |    |    |           | 101       |    | 5                          |                      |   | 24 | 100 |            | 3    | 12 |   |
| Percent Heavy Vehicles (%)                                                                                         |                                       |    |    |    |           | 6         |    | 0                          |                      |   |    |     |            | 67   |    |   |
| Proportion Time Blocked                                                                                            |                                       |    |    |    |           |           |    |                            |                      |   |    |     |            |      |    |   |
| Percent Grade (%)                                                                                                  |                                       |    |    |    |           | 0         |    |                            |                      |   |    |     |            |      |    |   |
| Right Turn Channelized                                                                                             |                                       |    |    |    |           |           |    |                            |                      |   |    |     |            |      |    |   |
| Median Type   Storage                                                                                              |                                       |    |    |    |           | Undivided |    |                            |                      |   |    |     |            |      |    |   |
| <b>Critical and Follow-up Headways</b>                                                                             |                                       |    |    |    |           |           |    |                            |                      |   |    |     |            |      |    |   |
| Base Critical Headway (sec)                                                                                        |                                       |    |    |    |           | 7.1       |    | 6.2                        |                      |   |    |     |            | 4.1  |    |   |
| Critical Headway (sec)                                                                                             |                                       |    |    |    |           | 6.46      |    | 6.20                       |                      |   |    |     |            | 4.77 |    |   |
| Base Follow-Up Headway (sec)                                                                                       |                                       |    |    |    |           | 3.5       |    | 3.3                        |                      |   |    |     |            | 2.2  |    |   |
| Follow-Up Headway (sec)                                                                                            |                                       |    |    |    |           | 3.55      |    | 3.30                       |                      |   |    |     |            | 2.80 |    |   |
| <b>Delay, Queue Length, and Level of Service</b>                                                                   |                                       |    |    |    |           |           |    |                            |                      |   |    |     |            |      |    |   |
| Flow Rate, v (veh/h)                                                                                               |                                       |    |    |    |           | 113       |    |                            |                      |   |    |     |            | 3    |    |   |
| Capacity, c (veh/h)                                                                                                |                                       |    |    |    |           | 893       |    |                            |                      |   |    |     |            | 1135 |    |   |
| v/c Ratio                                                                                                          |                                       |    |    |    |           | 0.13      |    |                            |                      |   |    |     |            | 0.00 |    |   |
| 95% Queue Length, Q <sub>95</sub> (veh)                                                                            |                                       |    |    |    |           | 0.4       |    |                            |                      |   |    |     |            | 0.0  |    |   |
| Control Delay (s/veh)                                                                                              |                                       |    |    |    |           | 9.6       |    |                            |                      |   |    |     |            | 8.2  |    |   |
| Level of Service (LOS)                                                                                             |                                       |    |    |    |           | A         |    |                            |                      |   |    |     |            | A    |    |   |
| Approach Delay (s/veh)                                                                                             |                                       |    |    |    |           | 9.6       |    |                            |                      |   |    |     |            | 1.7  |    |   |
| Approach LOS                                                                                                       |                                       |    |    |    |           | A         |    |                            |                      |   |    |     |            |      |    |   |



| HCS7 Two-Way Stop-Control Report                 |                                       |    |    |    |           |      |    |                            |            |   |    |                      |            |      |    |   |
|--------------------------------------------------|---------------------------------------|----|----|----|-----------|------|----|----------------------------|------------|---|----|----------------------|------------|------|----|---|
| General Information                              |                                       |    |    |    |           |      |    | Site Information           |            |   |    |                      |            |      |    |   |
| Analyst                                          | DBZ                                   |    |    |    |           |      |    | Intersection               |            |   |    | Thixton at Oak Grove |            |      |    |   |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |    |    |    |           |      |    | Jurisdiction               |            |   |    |                      |            |      |    |   |
| Date Performed                                   | 9/19/2021                             |    |    |    |           |      |    | East/West Street           |            |   |    | Thixton              |            |      |    |   |
| Analysis Year                                    | 2027                                  |    |    |    |           |      |    | North/South Street         |            |   |    | Oak Grove/Thixton    |            |      |    |   |
| Time Analyzed                                    | AM Peak Build                         |    |    |    |           |      |    | Peak Hour Factor           |            |   |    | 0.94                 |            |      |    |   |
| Intersection Orientation                         | North-South                           |    |    |    |           |      |    | Analysis Time Period (hrs) |            |   |    | 0.25                 |            |      |    |   |
| Project Description                              | Oak Grove                             |    |    |    |           |      |    |                            |            |   |    |                      |            |      |    |   |
| <b>Lanes</b>                                     |                                       |    |    |    |           |      |    |                            |            |   |    |                      |            |      |    |   |
| <p>Major Street: North-South</p>                 |                                       |    |    |    |           |      |    |                            |            |   |    |                      |            |      |    |   |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |    |    |    |           |      |    |                            |            |   |    |                      |            |      |    |   |
| Approach                                         | Eastbound                             |    |    |    | Westbound |      |    |                            | Northbound |   |    |                      | Southbound |      |    |   |
| Movement                                         | U                                     | L  | T  | R  | U         | L    | T  | R                          | U          | L | T  | R                    | U          | L    | T  | R |
| Priority                                         |                                       | 10 | 11 | 12 |           | 7    | 8  | 9                          | 1U         | 1 | 2  | 3                    | 4U         | 4    | 5  | 6 |
| Number of Lanes                                  |                                       | 0  | 0  | 0  |           | 0    | 1  | 0                          | 0          | 0 | 1  | 0                    | 0          | 0    | 1  | 0 |
| Configuration                                    |                                       |    |    |    |           |      | LR |                            |            |   |    | TR                   |            | LT   |    |   |
| Volume (veh/h)                                   |                                       |    |    |    |           | 106  |    | 24                         |            |   | 35 | 116                  |            | 59   | 46 |   |
| Percent Heavy Vehicles (%)                       |                                       |    |    |    |           | 6    |    | 0                          |            |   |    |                      |            | 67   |    |   |
| Proportion Time Blocked                          |                                       |    |    |    |           |      |    |                            |            |   |    |                      |            |      |    |   |
| Percent Grade (%)                                |                                       |    |    |    | 0         |      |    |                            |            |   |    |                      |            |      |    |   |
| Right Turn Channelized                           |                                       |    |    |    |           |      |    |                            |            |   |    |                      |            |      |    |   |
| Median Type   Storage                            |                                       |    |    |    | Undivided |      |    |                            |            |   |    |                      |            |      |    |   |
| <b>Critical and Follow-up Headways</b>           |                                       |    |    |    |           |      |    |                            |            |   |    |                      |            |      |    |   |
| Base Critical Headway (sec)                      |                                       |    |    |    |           | 7.1  |    | 6.2                        |            |   |    |                      |            | 4.1  |    |   |
| Critical Headway (sec)                           |                                       |    |    |    |           | 6.46 |    | 6.20                       |            |   |    |                      |            | 4.77 |    |   |
| Base Follow-Up Headway (sec)                     |                                       |    |    |    |           | 3.5  |    | 3.3                        |            |   |    |                      |            | 2.2  |    |   |
| Follow-Up Headway (sec)                          |                                       |    |    |    |           | 3.55 |    | 3.30                       |            |   |    |                      |            | 2.80 |    |   |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |    |    |    |           |      |    |                            |            |   |    |                      |            |      |    |   |
| Flow Rate, v (veh/h)                             |                                       |    |    |    |           | 138  |    |                            |            |   |    |                      |            | 63   |    |   |
| Capacity, c (veh/h)                              |                                       |    |    |    |           | 706  |    |                            |            |   |    |                      |            | 1104 |    |   |
| v/c Ratio                                        |                                       |    |    |    |           | 0.20 |    |                            |            |   |    |                      |            | 0.06 |    |   |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |    |    |    |           | 0.7  |    |                            |            |   |    |                      |            | 0.2  |    |   |
| Control Delay (s/veh)                            |                                       |    |    |    |           | 11.3 |    |                            |            |   |    |                      |            | 8.5  |    |   |
| Level of Service (LOS)                           |                                       |    |    |    |           | B    |    |                            |            |   |    |                      |            | A    |    |   |
| Approach Delay (s/veh)                           |                                       |    |    |    | 11.3      |      |    |                            |            |   |    |                      | 5.0        |      |    |   |
| Approach LOS                                     |                                       |    |    |    | B         |      |    |                            |            |   |    |                      |            |      |    |   |



| HCS7 Two-Way Stop-Control Report                 |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
|--------------------------------------------------|---------------------------------------|----|----|----|-----------|------|----|----------------------------|----------------------|---|---|-----|------------|------|----|---|
| General Information                              |                                       |    |    |    |           |      |    | Site Information           |                      |   |   |     |            |      |    |   |
| Analyst                                          | DBZ                                   |    |    |    |           |      |    | Intersection               | Thixton at Oak Grove |   |   |     |            |      |    |   |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |    |    |    |           |      |    | Jurisdiction               |                      |   |   |     |            |      |    |   |
| Date Performed                                   | 9/19/2021                             |    |    |    |           |      |    | East/West Street           | Thixton              |   |   |     |            |      |    |   |
| Analysis Year                                    | 2021                                  |    |    |    |           |      |    | North/South Street         | Oak Grove/Thixton    |   |   |     |            |      |    |   |
| Time Analyzed                                    | PM Peak                               |    |    |    |           |      |    | Peak Hour Factor           | 0.92                 |   |   |     |            |      |    |   |
| Intersection Orientation                         | North-South                           |    |    |    |           |      |    | Analysis Time Period (hrs) | 0.25                 |   |   |     |            |      |    |   |
| Project Description                              | Oak Grove                             |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| <b>Lanes</b>                                     |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| <p>Major Street: North-South</p>                 |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Approach                                         | Eastbound                             |    |    |    | Westbound |      |    |                            | Northbound           |   |   |     | Southbound |      |    |   |
| Movement                                         | U                                     | L  | T  | R  | U         | L    | T  | R                          | U                    | L | T | R   | U          | L    | T  | R |
| Priority                                         |                                       | 10 | 11 | 12 |           | 7    | 8  | 9                          | 1U                   | 1 | 2 | 3   | 4U         | 4    | 5  | 6 |
| Number of Lanes                                  |                                       | 0  | 0  | 0  |           | 0    | 1  | 0                          | 0                    | 0 | 1 | 0   | 0          | 0    | 1  | 0 |
| Configuration                                    |                                       |    |    |    |           |      | LR |                            |                      |   |   | TR  |            | LT   |    |   |
| Volume (veh/h)                                   |                                       |    |    |    |           | 129  |    | 7                          |                      |   | 9 | 157 |            | 6    | 19 |   |
| Percent Heavy Vehicles (%)                       |                                       |    |    |    |           | 3    |    | 0                          |                      |   |   |     |            | 17   |    |   |
| Proportion Time Blocked                          |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Percent Grade (%)                                |                                       |    |    |    | 0         |      |    |                            |                      |   |   |     |            |      |    |   |
| Right Turn Channelized                           |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Median Type   Storage                            | Undivided                             |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| <b>Critical and Follow-up Headways</b>           |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Base Critical Headway (sec)                      |                                       |    |    |    |           | 7.1  |    | 6.2                        |                      |   |   |     |            | 4.1  |    |   |
| Critical Headway (sec)                           |                                       |    |    |    |           | 6.43 |    | 6.20                       |                      |   |   |     |            | 4.27 |    |   |
| Base Follow-Up Headway (sec)                     |                                       |    |    |    |           | 3.5  |    | 3.3                        |                      |   |   |     |            | 2.2  |    |   |
| Follow-Up Headway (sec)                          |                                       |    |    |    |           | 3.53 |    | 3.30                       |                      |   |   |     |            | 2.35 |    |   |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Flow Rate, v (veh/h)                             |                                       |    |    |    |           | 148  |    |                            |                      |   |   |     |            | 7    |    |   |
| Capacity, c (veh/h)                              |                                       |    |    |    |           | 864  |    |                            |                      |   |   |     |            | 1309 |    |   |
| v/c Ratio                                        |                                       |    |    |    |           | 0.17 |    |                            |                      |   |   |     |            | 0.00 |    |   |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |    |    |    |           | 0.6  |    |                            |                      |   |   |     |            | 0.0  |    |   |
| Control Delay (s/veh)                            |                                       |    |    |    |           | 10.0 |    |                            |                      |   |   |     |            | 7.8  |    |   |
| Level of Service (LOS)                           |                                       |    |    |    |           | B    |    |                            |                      |   |   |     |            | A    |    |   |
| Approach Delay (s/veh)                           |                                       |    |    |    | 10.0      |      |    |                            |                      |   |   |     | 1.9        |      |    |   |
| Approach LOS                                     |                                       |    |    |    | B         |      |    |                            |                      |   |   |     |            |      |    |   |



Oak Grove Subdivision  
Traffic Impact Study

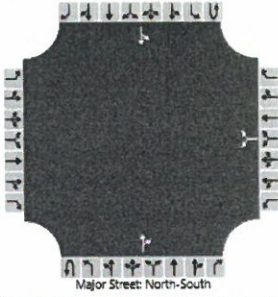
| HCS7 Two-Way Stop-Control Report                 |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
|--------------------------------------------------|---------------------------------------|----|----|----|-----------|------|----|----------------------------|----------------------|---|---|-----|------------|------|----|---|
| General Information                              |                                       |    |    |    |           |      |    | Site Information           |                      |   |   |     |            |      |    |   |
| Analyst                                          | DBZ                                   |    |    |    |           |      |    | Intersection               | Thixton at Oak Grove |   |   |     |            |      |    |   |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |    |    |    |           |      |    | Jurisdiction               |                      |   |   |     |            |      |    |   |
| Date Performed                                   | 9/19/2021                             |    |    |    |           |      |    | East/West Street           | Thixton              |   |   |     |            |      |    |   |
| Analysis Year                                    | 2027                                  |    |    |    |           |      |    | North/South Street         | Oak Grove/Thixton    |   |   |     |            |      |    |   |
| Time Analyzed                                    | PM Peak No Build                      |    |    |    |           |      |    | Peak Hour Factor           | 0.92                 |   |   |     |            |      |    |   |
| Intersection Orientation                         | North-South                           |    |    |    |           |      |    | Analysis Time Period (hrs) | 0.25                 |   |   |     |            |      |    |   |
| Project Description                              | Oak Grove                             |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| <b>Lanes</b>                                     |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
|                                                  |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Approach                                         | Eastbound                             |    |    |    | Westbound |      |    |                            | Northbound           |   |   |     | Southbound |      |    |   |
| Movement                                         | U                                     | L  | T  | R  | U         | L    | T  | R                          | U                    | L | T | R   | U          | L    | T  | R |
| Priority                                         |                                       | 10 | 11 | 12 |           | 7    | 8  | 9                          | 1U                   | 1 | 2 | 3   | 4U         | 4    | 5  | 6 |
| Number of Lanes                                  |                                       | 0  | 0  | 0  |           | 0    | 1  | 0                          | 0                    | 0 | 1 | 0   | 0          | 0    | 1  | 0 |
| Configuration                                    |                                       |    |    |    |           |      | LR |                            |                      |   |   | TR  |            | LT   |    |   |
| Volume (veh/h)                                   |                                       |    |    |    |           | 145  |    | 7                          |                      |   | 9 | 177 |            | 6    | 19 |   |
| Percent Heavy Vehicles (%)                       |                                       |    |    |    |           | 3    |    | 0                          |                      |   |   |     |            | 17   |    |   |
| Proportion Time Blocked                          |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Percent Grade (%)                                |                                       |    |    |    | 0         |      |    |                            |                      |   |   |     |            |      |    |   |
| Right Turn Channelized                           |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Median Type   Storage                            | Undivided                             |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| <b>Critical and Follow-up Headways</b>           |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Base Critical Headway (sec)                      |                                       |    |    |    |           | 7.1  |    | 6.2                        |                      |   |   |     |            | 4.1  |    |   |
| Critical Headway (sec)                           |                                       |    |    |    |           | 6.43 |    | 6.20                       |                      |   |   |     |            | 4.27 |    |   |
| Base Follow-Up Headway (sec)                     |                                       |    |    |    |           | 3.5  |    | 3.3                        |                      |   |   |     |            | 2.2  |    |   |
| Follow-Up Headway (sec)                          |                                       |    |    |    |           | 3.53 |    | 3.30                       |                      |   |   |     |            | 2.35 |    |   |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Flow Rate, v (veh/h)                             |                                       |    |    |    |           | 165  |    |                            |                      |   |   |     |            | 7    |    |   |
| Capacity, c (veh/h)                              |                                       |    |    |    |           | 851  |    |                            |                      |   |   |     |            | 1285 |    |   |
| v/c Ratio                                        |                                       |    |    |    |           | 0.19 |    |                            |                      |   |   |     |            | 0.01 |    |   |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |    |    |    |           | 0.7  |    |                            |                      |   |   |     |            | 0.0  |    |   |
| Control Delay (s/veh)                            |                                       |    |    |    |           | 10.2 |    |                            |                      |   |   |     |            | 7.8  |    |   |
| Level of Service (LOS)                           |                                       |    |    |    |           | B    |    |                            |                      |   |   |     |            | A    |    |   |
| Approach Delay (s/veh)                           |                                       |    |    |    | 10.2      |      |    |                            |                      |   |   |     | 1.9        |      |    |   |
| Approach LOS                                     |                                       |    |    |    | B         |      |    |                            |                      |   |   |     |            |      |    |   |

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| HCS7 Two-Way Stop-Control Report                                                  |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |   |      |    |
|-----------------------------------------------------------------------------------|---------------------------------------|----|----|----|-----------|------|----|----------------------------|----------------------|---|----|-----|------------|---|------|----|
| General Information                                                               |                                       |    |    |    |           |      |    | Site Information           |                      |   |    |     |            |   |      |    |
| Analyst                                                                           | DBZ                                   |    |    |    |           |      |    | Intersection               | Thixton at Oak Grove |   |    |     |            |   |      |    |
| Agency/Co.                                                                        | Diane B Zimmerman Traffic Engineering |    |    |    |           |      |    | Jurisdiction               |                      |   |    |     |            |   |      |    |
| Date Performed                                                                    | 9/19/2021                             |    |    |    |           |      |    | East/West Street           | Thixton              |   |    |     |            |   |      |    |
| Analysis Year                                                                     | 2027                                  |    |    |    |           |      |    | North/South Street         | Oak Grove/Thixton    |   |    |     |            |   |      |    |
| Time Analyzed                                                                     | PM Peak Build                         |    |    |    |           |      |    | Peak Hour Factor           | 0.92                 |   |    |     |            |   |      |    |
| Intersection Orientation                                                          | North-South                           |    |    |    |           |      |    | Analysis Time Period (hrs) | 0.25                 |   |    |     |            |   |      |    |
| Project Description                                                               | Oak Grove                             |    |    |    |           |      |    |                            |                      |   |    |     |            |   |      |    |
| Lanes                                                                             |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |   |      |    |
|  |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |   |      |    |
| Vehicle Volumes and Adjustments                                                   |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |   |      |    |
| Approach                                                                          | Eastbound                             |    |    |    | Westbound |      |    |                            | Northbound           |   |    |     | Southbound |   |      |    |
| Movement                                                                          | U                                     | L  | T  | R  | U         | L    | T  | R                          | U                    | L | T  | R   | U          | L | T    | R  |
| Priority                                                                          |                                       | 10 | 11 | 12 |           | 7    | 8  | 9                          | 1U                   | 1 | 2  | 3   | 4U         | 4 | 5    | 6  |
| Number of Lanes                                                                   |                                       | 0  | 0  | 0  |           | 0    | 1  | 0                          | 0                    | 0 | 1  | 0   | 0          | 0 | 1    | 0  |
| Configuration                                                                     |                                       |    |    |    |           |      | LR |                            |                      |   |    | TR  |            |   | LT   |    |
| Volume (veh/h)                                                                    |                                       |    |    |    |           | 163  |    | 70                         |                      |   | 47 | 187 |            |   | 43   | 42 |
| Percent Heavy Vehicles (%)                                                        |                                       |    |    |    |           | 3    |    | 0                          |                      |   |    |     |            |   | 2    |    |
| Proportion Time Blocked                                                           |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |   |      |    |
| Percent Grade (%)                                                                 | 0                                     |    |    |    |           |      |    |                            |                      |   |    |     |            |   |      |    |
| Right Turn Channelized                                                            |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |   |      |    |
| Median Type   Storage                                                             | Undivided                             |    |    |    |           |      |    |                            |                      |   |    |     |            |   |      |    |
| Critical and Follow-up Headways                                                   |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |   |      |    |
| Base Critical Headway (sec)                                                       |                                       |    |    |    |           | 7.1  |    | 6.2                        |                      |   |    |     |            |   | 4.1  |    |
| Critical Headway (sec)                                                            |                                       |    |    |    |           | 6.43 |    | 6.20                       |                      |   |    |     |            |   | 4.12 |    |
| Base Follow-Up Headway (sec)                                                      |                                       |    |    |    |           | 3.5  |    | 3.3                        |                      |   |    |     |            |   | 2.2  |    |
| Follow-Up Headway (sec)                                                           |                                       |    |    |    |           | 3.53 |    | 3.30                       |                      |   |    |     |            |   | 2.22 |    |
| Delay, Queue Length, and Level of Service                                         |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |   |      |    |
| Flow Rate, v (veh/h)                                                              |                                       |    |    |    |           | 253  |    |                            |                      |   |    |     |            |   | 47   |    |
| Capacity, c (veh/h)                                                               |                                       |    |    |    |           | 727  |    |                            |                      |   |    |     |            |   | 1311 |    |
| v/c Ratio                                                                         |                                       |    |    |    |           | 0.35 |    |                            |                      |   |    |     |            |   | 0.04 |    |
| 95% Queue Length, Q <sub>95</sub> (veh)                                           |                                       |    |    |    |           | 1.6  |    |                            |                      |   |    |     |            |   | 0.1  |    |
| Control Delay (s/veh)                                                             |                                       |    |    |    |           | 12.6 |    |                            |                      |   |    |     |            |   | 7.8  |    |
| Level of Service (LOS)                                                            |                                       |    |    |    |           | B    |    |                            |                      |   |    |     |            |   | A    |    |
| Approach Delay (s/veh)                                                            |                                       |    |    |    | 12.6      |      |    |                            |                      |   |    |     | 4.1        |   |      |    |
| Approach LOS                                                                      |                                       |    |    |    | B         |      |    |                            |                      |   |    |     |            |   |      |    |



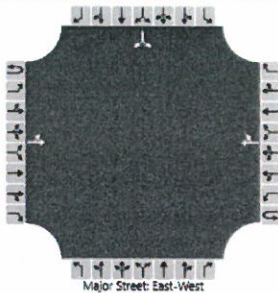
| HCS7 Two-Way Stop-Control Report                 |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
|--------------------------------------------------|---------------------------------------|----|----|----|-----------|------|----|----------------------------|-----------------------|---|----|----|------------|------|---|---|
| General Information                              |                                       |    |    |    |           |      |    | Site Information           |                       |   |    |    |            |      |   |   |
| Analyst                                          | DBZ                                   |    |    |    |           |      |    | Intersection               | Oak Grove at Entrance |   |    |    |            |      |   |   |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |    |    |    |           |      |    | Jurisdiction               |                       |   |    |    |            |      |   |   |
| Date Performed                                   | 9/19/2021                             |    |    |    |           |      |    | East/West Street           | Oak Grove             |   |    |    |            |      |   |   |
| Analysis Year                                    | 2027                                  |    |    |    |           |      |    | North/South Street         | Oak Grove/Entrance    |   |    |    |            |      |   |   |
| Time Analyzed                                    | AM Peak Build                         |    |    |    |           |      |    | Peak Hour Factor           | 0.94                  |   |    |    |            |      |   |   |
| Intersection Orientation                         | North-South                           |    |    |    |           |      |    | Analysis Time Period (hrs) | 0.25                  |   |    |    |            |      |   |   |
| Project Description                              | Oak Grove                             |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
| <b>Lanes</b>                                     |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
|                                                  |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
| Approach                                         | Eastbound                             |    |    |    | Westbound |      |    |                            | Northbound            |   |    |    | Southbound |      |   |   |
| Movement                                         | U                                     | L  | T  | R  | U         | L    | T  | R                          | U                     | L | T  | R  | U          | L    | T | R |
| Priority                                         |                                       | 10 | 11 | 12 |           | 7    | 8  | 9                          | 1U                    | 1 | 2  | 3  | 4U         | 4    | 5 | 6 |
| Number of Lanes                                  |                                       | 0  | 0  | 0  |           | 0    | 1  | 0                          | 0                     | 0 | 1  | 0  | 0          | 0    | 1 | 0 |
| Configuration                                    |                                       |    |    |    |           |      | LR |                            |                       |   |    | TR |            | LT   |   |   |
| Volume (veh/h)                                   |                                       |    |    |    |           | 30   |    | 29                         |                       |   | 29 | 90 |            | 15   | 9 |   |
| Percent Heavy Vehicles (%)                       |                                       |    |    |    |           | 0    |    | 3                          |                       |   |    |    |            | 7    |   |   |
| Proportion Time Blocked                          |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
| Percent Grade (%)                                |                                       |    |    |    | 0         |      |    |                            |                       |   |    |    |            |      |   |   |
| Right Turn Channelized                           |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
| Median Type   Storage                            |                                       |    |    |    | Undivided |      |    |                            |                       |   |    |    |            |      |   |   |
| <b>Critical and Follow-up Headways</b>           |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
| Base Critical Headway (sec)                      |                                       |    |    |    |           | 7.1  |    | 6.2                        |                       |   |    |    |            | 4.1  |   |   |
| Critical Headway (sec)                           |                                       |    |    |    |           | 6.40 |    | 6.23                       |                       |   |    |    |            | 4.17 |   |   |
| Base Follow-Up Headway (sec)                     |                                       |    |    |    |           | 3.5  |    | 3.3                        |                       |   |    |    |            | 2.2  |   |   |
| Follow-Up Headway (sec)                          |                                       |    |    |    |           | 3.50 |    | 3.33                       |                       |   |    |    |            | 2.26 |   |   |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
| Flow Rate, v (veh/h)                             |                                       |    |    |    |           | 63   |    |                            |                       |   |    |    |            | 16   |   |   |
| Capacity, c (veh/h)                              |                                       |    |    |    |           | 921  |    |                            |                       |   |    |    |            | 1429 |   |   |
| v/c Ratio                                        |                                       |    |    |    |           | 0.07 |    |                            |                       |   |    |    |            | 0.01 |   |   |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |    |    |    |           | 0.2  |    |                            |                       |   |    |    |            | 0.0  |   |   |
| Control Delay (s/veh)                            |                                       |    |    |    |           | 9.2  |    |                            |                       |   |    |    |            | 7.5  |   |   |
| Level of Service (LOS)                           |                                       |    |    |    |           | A    |    |                            |                       |   |    |    |            | A    |   |   |
| Approach Delay (s/veh)                           |                                       |    |    |    | 9.2       |      |    |                            |                       |   |    |    | 4.7        |      |   |   |
| Approach LOS                                     |                                       |    |    |    | A         |      |    |                            |                       |   |    |    |            |      |   |   |



| HCS7 Two-Way Stop-Control Report                                               |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |    |   |
|--------------------------------------------------------------------------------|---------------------------------------|----|----|----|-----------|------|----|----------------------------|-----------------------|---|----|----|------------|------|----|---|
| General Information                                                            |                                       |    |    |    |           |      |    | Site Information           |                       |   |    |    |            |      |    |   |
| Analyst                                                                        | DBZ                                   |    |    |    |           |      |    | Intersection               | Oak Grove at Entrance |   |    |    |            |      |    |   |
| Agency/Co.                                                                     | Diane B Zimmerman Traffic Engineering |    |    |    |           |      |    | Jurisdiction               |                       |   |    |    |            |      |    |   |
| Date Performed                                                                 | 9/19/2021                             |    |    |    |           |      |    | East/West Street           | Oak Grove             |   |    |    |            |      |    |   |
| Analysis Year                                                                  | 2027                                  |    |    |    |           |      |    | North/South Street         | Oak Grove/Entrance    |   |    |    |            |      |    |   |
| Time Analyzed                                                                  | PM Peak Build                         |    |    |    |           |      |    | Peak Hour Factor           | 0.92                  |   |    |    |            |      |    |   |
| Intersection Orientation                                                       | North-South                           |    |    |    |           |      |    | Analysis Time Period (hrs) | 0.25                  |   |    |    |            |      |    |   |
| Project Description                                                            | Oak Grove                             |    |    |    |           |      |    |                            |                       |   |    |    |            |      |    |   |
| <b>Lanes</b>                                                                   |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |    |   |
| <p style="text-align: center; font-size: small;">Major Street: North-South</p> |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |    |   |
| <b>Vehicle Volumes and Adjustments</b>                                         |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |    |   |
| Approach                                                                       | Eastbound                             |    |    |    | Westbound |      |    |                            | Northbound            |   |    |    | Southbound |      |    |   |
| Movement                                                                       | U                                     | L  | T  | R  | U         | L    | T  | R                          | U                     | L | T  | R  | U          | L    | T  | R |
| Priority                                                                       |                                       | 10 | 11 | 12 |           | 7    | 8  | 9                          | 1U                    | 1 | 2  | 3  | 4U         | 4    | 5  | 6 |
| Number of Lanes                                                                |                                       | 0  | 0  | 0  |           | 0    | 1  | 0                          | 0                     | 0 | 1  | 0  | 0          | 0    | 1  | 0 |
| Configuration                                                                  |                                       |    |    |    |           |      | LR |                            |                       |   |    | TR |            | LT   |    |   |
| Volume (veh/h)                                                                 |                                       |    |    |    |           | 101  |    | 16                         |                       |   | 19 | 60 |            | 25   | 32 |   |
| Percent Heavy Vehicles (%)                                                     |                                       |    |    |    |           | 0    |    | 0                          |                       |   |    |    |            | 4    |    |   |
| Proportion Time Blocked                                                        |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |    |   |
| Percent Grade (%)                                                              |                                       |    |    |    | 0         |      |    |                            |                       |   |    |    |            |      |    |   |
| Right Turn Channelized                                                         |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |    |   |
| Median Type   Storage                                                          | Undivided                             |    |    |    |           |      |    |                            |                       |   |    |    |            |      |    |   |
| <b>Critical and Follow-up Headways</b>                                         |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |    |   |
| Base Critical Headway (sec)                                                    |                                       |    |    |    |           | 7.1  |    | 6.2                        |                       |   |    |    |            | 4.1  |    |   |
| Critical Headway (sec)                                                         |                                       |    |    |    |           | 6.40 |    | 6.20                       |                       |   |    |    |            | 4.14 |    |   |
| Base Follow-Up Headway (sec)                                                   |                                       |    |    |    |           | 3.5  |    | 3.3                        |                       |   |    |    |            | 2.2  |    |   |
| Follow-Up Headway (sec)                                                        |                                       |    |    |    |           | 3.50 |    | 3.30                       |                       |   |    |    |            | 2.24 |    |   |
| <b>Delay, Queue Length, and Level of Service</b>                               |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |    |   |
| Flow Rate, v (veh/h)                                                           |                                       |    |    |    |           | 127  |    |                            |                       |   |    |    |            | 27   |    |   |
| Capacity, c (veh/h)                                                            |                                       |    |    |    |           | 860  |    |                            |                       |   |    |    |            | 1498 |    |   |
| v/c Ratio                                                                      |                                       |    |    |    |           | 0.15 |    |                            |                       |   |    |    |            | 0.02 |    |   |
| 95% Queue Length, Q <sub>95</sub> (veh)                                        |                                       |    |    |    |           | 0.5  |    |                            |                       |   |    |    |            | 0.1  |    |   |
| Control Delay (s/veh)                                                          |                                       |    |    |    |           | 9.9  |    |                            |                       |   |    |    |            | 7.4  |    |   |
| Level of Service (LOS)                                                         |                                       |    |    |    |           | A    |    |                            |                       |   |    |    |            | A    |    |   |
| Approach Delay (s/veh)                                                         |                                       |    |    |    | 9.9       |      |    |                            |                       |   |    |    | 3.3        |      |    |   |
| Approach LOS                                                                   |                                       |    |    |    | A         |      |    |                            |                       |   |    |    |            |      |    |   |



Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Two-Way Stop-Control Report                                                  |                                       |           |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |  |
|-----------------------------------------------------------------------------------|---------------------------------------|-----------|----|---|-----------|---|----|----------------------------|-------------------------|---|---|---|------------|------|----|------|--|
| General Information                                                               |                                       |           |    |   |           |   |    | Site Information           |                         |   |   |   |            |      |    |      |  |
| Analyst                                                                           | DBZ                                   |           |    |   |           |   |    | Intersection               | Thixton at Pebble Trace |   |   |   |            |      |    |      |  |
| Agency/Co.                                                                        | Diane B Zimmerman Traffic Engineering |           |    |   |           |   |    | Jurisdiction               |                         |   |   |   |            |      |    |      |  |
| Date Performed                                                                    | 9/19/2021                             |           |    |   |           |   |    | East/West Street           | Thixton Lane            |   |   |   |            |      |    |      |  |
| Analysis Year                                                                     | 2021                                  |           |    |   |           |   |    | North/South Street         | Pebble Trace            |   |   |   |            |      |    |      |  |
| Time Analyzed                                                                     | AM Peak                               |           |    |   |           |   |    | Peak Hour Factor           | 0.90                    |   |   |   |            |      |    |      |  |
| Intersection Orientation                                                          | East-West                             |           |    |   |           |   |    | Analysis Time Period (hrs) | 0.25                    |   |   |   |            |      |    |      |  |
| Project Description                                                               | Oak Grove                             |           |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |  |
| <b>Lanes</b>                                                                      |                                       |           |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |  |
|  |                                       |           |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |  |
| <b>Vehicle Volumes and Adjustments</b>                                            |                                       |           |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |  |
| Approach                                                                          | Eastbound                             |           |    |   | Westbound |   |    |                            | Northbound              |   |   |   | Southbound |      |    |      |  |
| Movement                                                                          | U                                     | L         | T  | R | U         | L | T  | R                          | U                       | L | T | R | U          | L    | T  | R    |  |
| Priority                                                                          | 1U                                    | 1         | 2  | 3 | 4U        | 4 | 5  | 6                          |                         | 7 | 8 | 9 |            | 10   | 11 | 12   |  |
| Number of Lanes                                                                   | 0                                     | 0         | 1  | 0 | 0         | 0 | 1  | 0                          |                         | 0 | 0 | 0 |            | 0    | 1  | 0    |  |
| Configuration                                                                     |                                       | LT        |    |   |           |   |    | TR                         |                         |   |   |   |            |      | LR |      |  |
| Volume (veh/h)                                                                    |                                       | 10        | 74 |   |           |   | 88 | 15                         |                         |   |   |   |            | 35   |    | 26   |  |
| Percent Heavy Vehicles (%)                                                        |                                       | 0         |    |   |           |   |    |                            |                         |   |   |   |            | 0    |    | 4    |  |
| Proportion Time Blocked                                                           |                                       |           |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |  |
| Percent Grade (%)                                                                 |                                       |           |    |   |           |   |    |                            |                         |   |   |   |            | 0    |    |      |  |
| Right Turn Channelized                                                            |                                       |           |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |  |
| Median Type   Storage                                                             |                                       | Undivided |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |  |
| <b>Critical and Follow-up Headways</b>                                            |                                       |           |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |  |
| Base Critical Headway (sec)                                                       |                                       | 4.1       |    |   |           |   |    |                            |                         |   |   |   |            | 7.1  |    | 6.2  |  |
| Critical Headway (sec)                                                            |                                       | 4.10      |    |   |           |   |    |                            |                         |   |   |   |            | 6.40 |    | 6.24 |  |
| Base Follow-Up Headway (sec)                                                      |                                       | 2.2       |    |   |           |   |    |                            |                         |   |   |   |            | 3.5  |    | 3.3  |  |
| Follow-Up Headway (sec)                                                           |                                       | 2.20      |    |   |           |   |    |                            |                         |   |   |   |            | 3.50 |    | 3.34 |  |
| <b>Delay, Queue Length, and Level of Service</b>                                  |                                       |           |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |  |
| Flow Rate, v (veh/h)                                                              |                                       | 11        |    |   |           |   |    |                            |                         |   |   |   |            | 68   |    |      |  |
| Capacity, c (veh/h)                                                               |                                       | 1487      |    |   |           |   |    |                            |                         |   |   |   |            | 839  |    |      |  |
| v/c Ratio                                                                         |                                       | 0.01      |    |   |           |   |    |                            |                         |   |   |   |            | 0.08 |    |      |  |
| 95% Queue Length, Q <sub>95</sub> (veh)                                           |                                       | 0.0       |    |   |           |   |    |                            |                         |   |   |   |            | 0.3  |    |      |  |
| Control Delay (s/veh)                                                             |                                       | 7.4       |    |   |           |   |    |                            |                         |   |   |   |            | 9.7  |    |      |  |
| Level of Service (LOS)                                                            |                                       | A         |    |   |           |   |    |                            |                         |   |   |   |            | A    |    |      |  |
| Approach Delay (s/veh)                                                            |                                       | 0.9       |    |   |           |   |    |                            |                         |   |   |   |            | 9.7  |    |      |  |
| Approach LOS                                                                      |                                       |           |    |   |           |   |    |                            |                         |   |   |   |            | A    |    |      |  |

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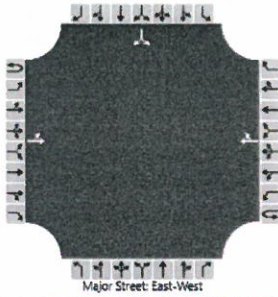
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| HCS7 Two-Way Stop-Control Report                 |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |      |      |
|--------------------------------------------------|---------------------------------------|------|----|---|-----------|---|----|----------------------------|-------------------------|---|---|---|------------|------|------|------|
| General Information                              |                                       |      |    |   |           |   |    | Site Information           |                         |   |   |   |            |      |      |      |
| Analyst                                          | DBZ                                   |      |    |   |           |   |    | Intersection               | Thixton at Pebble Trace |   |   |   |            |      |      |      |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |      |    |   |           |   |    | Jurisdiction               |                         |   |   |   |            |      |      |      |
| Date Performed                                   | 9/19/2021                             |      |    |   |           |   |    | East/West Street           | Thixton Lane            |   |   |   |            |      |      |      |
| Analysis Year                                    | 2027                                  |      |    |   |           |   |    | North/South Street         | Pebble Trace            |   |   |   |            |      |      |      |
| Time Analyzed                                    | AM Peak No Build                      |      |    |   |           |   |    | Peak Hour Factor           | 0.90                    |   |   |   |            |      |      |      |
| Intersection Orientation                         | East-West                             |      |    |   |           |   |    | Analysis Time Period (hrs) | 0.25                    |   |   |   |            |      |      |      |
| Project Description                              | Oak Grove                             |      |    |   |           |   |    |                            |                         |   |   |   |            |      |      |      |
| <b>Lanes</b>                                     |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |      |      |
|                                                  |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |      |      |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |      |      |
| Approach                                         | Eastbound                             |      |    |   | Westbound |   |    |                            | Northbound              |   |   |   | Southbound |      |      |      |
| Movement                                         | U                                     | L    | T  | R | U         | L | T  | R                          | U                       | L | T | R | U          | L    | T    | R    |
| Priority                                         | 1U                                    | 1    | 2  | 3 | 4U        | 4 | 5  | 6                          |                         | 7 | 8 | 9 |            | 10   | 11   | 12   |
| Number of Lanes                                  | 0                                     | 0    | 1  | 0 | 0         | 0 | 1  | 0                          |                         | 0 | 0 | 0 |            | 0    | 1    | 0    |
| Configuration                                    |                                       | LT   |    |   |           |   |    | TR                         |                         |   |   |   |            |      | LR   |      |
| Volume (veh/h)                                   |                                       | 10   | 83 |   |           |   | 99 | 15                         |                         |   |   |   |            | 35   |      | 26   |
| Percent Heavy Vehicles (%)                       |                                       | 0    |    |   |           |   |    |                            |                         |   |   |   |            | 0    |      | 4    |
| Proportion Time Blocked                          |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |      |      |
| Percent Grade (%)                                |                                       |      |    |   |           |   |    |                            |                         |   |   |   | 0          |      |      |      |
| Right Turn Channelized                           |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |      |      |
| Median Type   Storage                            |                                       |      |    |   | Undivided |   |    |                            |                         |   |   |   |            |      |      |      |
| <b>Critical and Follow-up Headways</b>           |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |      |      |
| Base Critical Headway (sec)                      |                                       | 4.1  |    |   |           |   |    |                            |                         |   |   |   |            | 7.1  |      | 6.2  |
| Critical Headway (sec)                           |                                       | 4.10 |    |   |           |   |    |                            |                         |   |   |   |            | 6.40 |      | 6.24 |
| Base Follow-Up Headway (sec)                     |                                       | 2.2  |    |   |           |   |    |                            |                         |   |   |   |            | 3.5  |      | 3.3  |
| Follow-Up Headway (sec)                          |                                       | 2.20 |    |   |           |   |    |                            |                         |   |   |   |            | 3.50 |      | 3.34 |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |      |      |
| Flow Rate, v (veh/h)                             |                                       | 11   |    |   |           |   |    |                            |                         |   |   |   |            |      | 68   |      |
| Capacity, c (veh/h)                              |                                       | 1472 |    |   |           |   |    |                            |                         |   |   |   |            |      | 819  |      |
| v/c Ratio                                        |                                       | 0.01 |    |   |           |   |    |                            |                         |   |   |   |            |      | 0.08 |      |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       | 0.0  |    |   |           |   |    |                            |                         |   |   |   |            |      | 0.3  |      |
| Control Delay (s/veh)                            |                                       | 7.5  |    |   |           |   |    |                            |                         |   |   |   |            |      | 9.8  |      |
| Level of Service (LOS)                           |                                       | A    |    |   |           |   |    |                            |                         |   |   |   |            |      | A    |      |
| Approach Delay (s/veh)                           | 0.9                                   |      |    |   |           |   |    |                            |                         |   |   |   | 9.8        |      |      |      |
| Approach LOS                                     |                                       |      |    |   |           |   |    |                            |                         |   |   |   | A          |      |      |      |



| HCS7 Two-Way Stop-Control Report                                                  |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
|-----------------------------------------------------------------------------------|---------------------------------------|------|----|---|-----------|---|-----|----------------------------|-------------------------|---|---|---|------------|------|----|------|
| General Information                                                               |                                       |      |    |   |           |   |     | Site Information           |                         |   |   |   |            |      |    |      |
| Analyst                                                                           | DBZ                                   |      |    |   |           |   |     | Intersection               | Thixton at Pebble Trace |   |   |   |            |      |    |      |
| Agency/Co.                                                                        | Diane B Zimmerman Traffic Engineering |      |    |   |           |   |     | Jurisdiction               |                         |   |   |   |            |      |    |      |
| Date Performed                                                                    | 9/19/2021                             |      |    |   |           |   |     | East/West Street           | Thixton Lane            |   |   |   |            |      |    |      |
| Analysis Year                                                                     | 2027                                  |      |    |   |           |   |     | North/South Street         | Pebble Trace            |   |   |   |            |      |    |      |
| Time Analyzed                                                                     | AM Peak Build                         |      |    |   |           |   |     | Peak Hour Factor           | 0.90                    |   |   |   |            |      |    |      |
| Intersection Orientation                                                          | East-West                             |      |    |   |           |   |     | Analysis Time Period (hrs) | 0.25                    |   |   |   |            |      |    |      |
| Project Description                                                               | Oak Grove                             |      |    |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| <b>Lanes</b>                                                                      |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
|  |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| <b>Vehicle Volumes and Adjustments</b>                                            |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Approach                                                                          | Eastbound                             |      |    |   | Westbound |   |     |                            | Northbound              |   |   |   | Southbound |      |    |      |
| Movement                                                                          | U                                     | L    | T  | R | U         | L | T   | R                          | U                       | L | T | R | U          | L    | T  | R    |
| Priority                                                                          | 1U                                    | 1    | 2  | 3 | 4U        | 4 | 5   | 6                          |                         | 7 | 8 | 9 |            | 10   | 11 | 12   |
| Number of Lanes                                                                   | 0                                     | 0    | 1  | 0 | 0         | 0 | 1   | 0                          |                         | 0 | 0 | 0 |            | 0    | 1  | 0    |
| Configuration                                                                     | LT                                    |      |    |   |           |   |     |                            | TR                      |   |   |   | LR         |      |    |      |
| Volume (veh/h)                                                                    |                                       | 13   | 94 |   |           |   | 133 | 20                         |                         |   |   |   |            | 51   |    | 35   |
| Percent Heavy Vehicles (%)                                                        |                                       | 0    |    |   |           |   |     |                            |                         |   |   |   |            | 0    |    | 4    |
| Proportion Time Blocked                                                           |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Percent Grade (%)                                                                 | 0                                     |      |    |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Right Turn Channelized                                                            |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Median Type   Storage                                                             | Undivided                             |      |    |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| <b>Critical and Follow-up Headways</b>                                            |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Base Critical Headway (sec)                                                       |                                       | 4.1  |    |   |           |   |     |                            |                         |   |   |   |            | 7.1  |    | 6.2  |
| Critical Headway (sec)                                                            |                                       | 4.10 |    |   |           |   |     |                            |                         |   |   |   |            | 6.40 |    | 6.24 |
| Base Follow-Up Headway (sec)                                                      |                                       | 2.2  |    |   |           |   |     |                            |                         |   |   |   |            | 3.5  |    | 3.3  |
| Follow-Up Headway (sec)                                                           |                                       | 2.20 |    |   |           |   |     |                            |                         |   |   |   |            | 3.50 |    | 3.34 |
| <b>Delay, Queue Length, and Level of Service</b>                                  |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Flow Rate, v (veh/h)                                                              |                                       | 14   |    |   |           |   |     |                            |                         |   |   |   |            | 96   |    |      |
| Capacity, c (veh/h)                                                               |                                       | 1420 |    |   |           |   |     |                            |                         |   |   |   |            | 761  |    |      |
| v/c Ratio                                                                         |                                       | 0.01 |    |   |           |   |     |                            |                         |   |   |   |            | 0.13 |    |      |
| 95% Queue Length, Q <sub>95</sub> (veh)                                           |                                       | 0.0  |    |   |           |   |     |                            |                         |   |   |   |            | 0.4  |    |      |
| Control Delay (s/veh)                                                             |                                       | 7.6  |    |   |           |   |     |                            |                         |   |   |   |            | 10.4 |    |      |
| Level of Service (LOS)                                                            |                                       | A    |    |   |           |   |     |                            |                         |   |   |   |            | B    |    |      |
| Approach Delay (s/veh)                                                            | 1.0                                   |      |    |   |           |   |     |                            |                         |   |   |   | 10.4       |      |    |      |
| Approach LOS                                                                      |                                       |      |    |   |           |   |     |                            |                         |   |   |   | B          |      |    |      |



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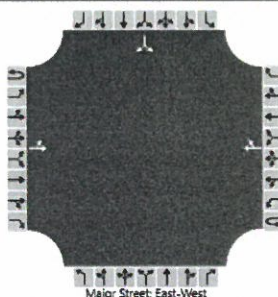
| HCS7 Two-Way Stop-Control Report                 |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
|--------------------------------------------------|---------------------------------------|------|-----|---|-----------|---|-----|----------------------------|-------------------------|---|---|---|------------|------|------|------|
| General Information                              |                                       |      |     |   |           |   |     | Site Information           |                         |   |   |   |            |      |      |      |
| Analyst                                          | DBZ                                   |      |     |   |           |   |     | Intersection               | Thixton at Pebble Trace |   |   |   |            |      |      |      |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |      |     |   |           |   |     | Jurisdiction               |                         |   |   |   |            |      |      |      |
| Date Performed                                   | 9/19/2021                             |      |     |   |           |   |     | East/West Street           | Thixton Lane            |   |   |   |            |      |      |      |
| Analysis Year                                    | 2021                                  |      |     |   |           |   |     | North/South Street         | Pebble Trace            |   |   |   |            |      |      |      |
| Time Analyzed                                    | PM Peak                               |      |     |   |           |   |     | Peak Hour Factor           | 0.92                    |   |   |   |            |      |      |      |
| Intersection Orientation                         | East-West                             |      |     |   |           |   |     | Analysis Time Period (hrs) | 0.25                    |   |   |   |            |      |      |      |
| Project Description                              | Oak Grove                             |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| <b>Lanes</b>                                     |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
|                                                  |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| Approach                                         | Eastbound                             |      |     |   | Westbound |   |     |                            | Northbound              |   |   |   | Southbound |      |      |      |
| Movement                                         | U                                     | L    | T   | R | U         | L | T   | R                          | U                       | L | T | R | U          | L    | T    | R    |
| Priority                                         | 1U                                    | 1    | 2   | 3 | 4U        | 4 | 5   | 6                          |                         | 7 | 8 | 9 |            | 10   | 11   | 12   |
| Number of Lanes                                  | 0                                     | 0    | 1   | 0 | 0         | 0 | 1   | 0                          |                         | 0 | 0 | 0 |            | 0    | 1    | 0    |
| Configuration                                    | LT                                    |      |     |   | TR        |   |     |                            |                         |   |   |   | LR         |      |      |      |
| Volume (veh/h)                                   |                                       | 22   | 144 |   |           |   | 114 | 34                         |                         |   |   |   |            | 19   |      | 9    |
| Percent Heavy Vehicles (%)                       |                                       | 5    |     |   |           |   |     |                            |                         |   |   |   |            | 5    |      | 11   |
| Proportion Time Blocked                          |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| Percent Grade (%)                                |                                       |      |     |   |           |   |     |                            |                         |   |   |   | 0          |      |      |      |
| Right Turn Channelized                           |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| Median Type   Storage                            | Undivided                             |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| <b>Critical and Follow-up Headways</b>           |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| Base Critical Headway (sec)                      |                                       | 4.1  |     |   |           |   |     |                            |                         |   |   |   |            | 7.1  |      | 6.2  |
| Critical Headway (sec)                           |                                       | 4.15 |     |   |           |   |     |                            |                         |   |   |   |            | 6.45 |      | 6.31 |
| Base Follow-Up Headway (sec)                     |                                       | 2.2  |     |   |           |   |     |                            |                         |   |   |   |            | 3.5  |      | 3.3  |
| Follow-Up Headway (sec)                          |                                       | 2.25 |     |   |           |   |     |                            |                         |   |   |   |            | 3.55 |      | 3.40 |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| Flow Rate, v (veh/h)                             |                                       | 24   |     |   |           |   |     |                            |                         |   |   |   |            |      | 30   |      |
| Capacity, c (veh/h)                              |                                       | 1400 |     |   |           |   |     |                            |                         |   |   |   |            |      | 695  |      |
| v/c Ratio                                        |                                       | 0.02 |     |   |           |   |     |                            |                         |   |   |   |            |      | 0.04 |      |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       | 0.1  |     |   |           |   |     |                            |                         |   |   |   |            |      | 0.1  |      |
| Control Delay (s/veh)                            |                                       | 7.6  |     |   |           |   |     |                            |                         |   |   |   |            |      | 10.4 |      |
| Level of Service (LOS)                           |                                       | A    |     |   |           |   |     |                            |                         |   |   |   |            |      | B    |      |
| Approach Delay (s/veh)                           | 1.1                                   |      |     |   |           |   |     |                            |                         |   |   |   | 10.4       |      |      |      |
| Approach LOS                                     |                                       |      |     |   |           |   |     |                            |                         |   |   |   | B          |      |      |      |



Oak Grove Subdivision  
Traffic Impact Study

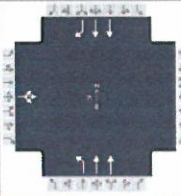
| HCS7 Two-Way Stop-Control Report                 |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
|--------------------------------------------------|---------------------------------------|------|-----|---|-----------|---|-----|----------------------------|-------------------------|---|---|---|------------|------|----|------|
| General Information                              |                                       |      |     |   |           |   |     | Site Information           |                         |   |   |   |            |      |    |      |
| Analyst                                          | DBZ                                   |      |     |   |           |   |     | Intersection               | Thixton at Pebble Trace |   |   |   |            |      |    |      |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |      |     |   |           |   |     | Jurisdiction               |                         |   |   |   |            |      |    |      |
| Date Performed                                   | 9/19/2021                             |      |     |   |           |   |     | East/West Street           | Thixton Lane            |   |   |   |            |      |    |      |
| Analysis Year                                    | 2027                                  |      |     |   |           |   |     | North/South Street         | Pebble Trace            |   |   |   |            |      |    |      |
| Time Analyzed                                    | PM Peak No Build                      |      |     |   |           |   |     | Peak Hour Factor           | 0.92                    |   |   |   |            |      |    |      |
| Intersection Orientation                         | East-West                             |      |     |   |           |   |     | Analysis Time Period (hrs) | 0.25                    |   |   |   |            |      |    |      |
| Project Description                              | Oak Grove                             |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| <b>Lanes</b>                                     |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
|                                                  |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Approach                                         | Eastbound                             |      |     |   | Westbound |   |     |                            | Northbound              |   |   |   | Southbound |      |    |      |
| Movement                                         | U                                     | L    | T   | R | U         | L | T   | R                          | U                       | L | T | R | U          | L    | T  | R    |
| Priority                                         | 1U                                    | 1    | 2   | 3 | 4U        | 4 | 5   | 6                          |                         | 7 | 8 | 9 |            | 10   | 11 | 12   |
| Number of Lanes                                  | 0                                     | 0    | 1   | 0 | 0         | 0 | 1   | 0                          |                         | 0 | 0 | 0 |            | 0    | 1  | 0    |
| Configuration                                    | LT                                    |      |     |   | TR        |   |     |                            |                         |   |   |   | LR         |      |    |      |
| Volume (veh/h)                                   |                                       | 22   | 162 |   |           |   | 128 | 34                         |                         |   |   |   |            | 19   |    | 9    |
| Percent Heavy Vehicles (%)                       |                                       | 5    |     |   |           |   |     |                            |                         |   |   |   |            | 5    |    | 11   |
| Proportion Time Blocked                          |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Percent Grade (%)                                |                                       |      |     |   |           |   |     |                            |                         |   |   |   | 0          |      |    |      |
| Right Turn Channelized                           |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Median Type   Storage                            | Undivided                             |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| <b>Critical and Follow-up Headways</b>           |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Base Critical Headway (sec)                      |                                       | 4.1  |     |   |           |   |     |                            |                         |   |   |   |            | 7.1  |    | 6.2  |
| Critical Headway (sec)                           |                                       | 4.15 |     |   |           |   |     |                            |                         |   |   |   |            | 6.45 |    | 6.31 |
| Base Follow-Up Headway (sec)                     |                                       | 2.2  |     |   |           |   |     |                            |                         |   |   |   |            | 3.5  |    | 3.3  |
| Follow-Up Headway (sec)                          |                                       | 2.25 |     |   |           |   |     |                            |                         |   |   |   |            | 3.55 |    | 3.40 |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Flow Rate, v (veh/h)                             |                                       | 24   |     |   |           |   |     |                            |                         |   |   |   |            | 30   |    |      |
| Capacity, c (veh/h)                              |                                       | 1382 |     |   |           |   |     |                            |                         |   |   |   |            | 668  |    |      |
| v/c Ratio                                        |                                       | 0.02 |     |   |           |   |     |                            |                         |   |   |   |            | 0.05 |    |      |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       | 0.1  |     |   |           |   |     |                            |                         |   |   |   |            | 0.1  |    |      |
| Control Delay (s/veh)                            |                                       | 7.7  |     |   |           |   |     |                            |                         |   |   |   |            | 10.6 |    |      |
| Level of Service (LOS)                           |                                       | A    |     |   |           |   |     |                            |                         |   |   |   |            | B    |    |      |
| Approach Delay (s/veh)                           | 1.0                                   |      |     |   |           |   |     |                            |                         |   |   |   | 10.6       |      |    |      |
| Approach LOS                                     |                                       |      |     |   |           |   |     |                            |                         |   |   |   | B          |      |    |      |



| HCS7 Two-Way Stop-Control Report                                                  |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
|-----------------------------------------------------------------------------------|---------------------------------------|------|-----|---|-----------|---|-----|----------------------------|-------------------------|---|---|---|------------|------|----|------|
| General Information                                                               |                                       |      |     |   |           |   |     | Site Information           |                         |   |   |   |            |      |    |      |
| Analyst                                                                           | DBZ                                   |      |     |   |           |   |     | Intersection               | Thixton at Pebble Trace |   |   |   |            |      |    |      |
| Agency/Co.                                                                        | Diane B Zimmerman Traffic Engineering |      |     |   |           |   |     | Jurisdiction               |                         |   |   |   |            |      |    |      |
| Date Performed                                                                    | 9/19/2021                             |      |     |   |           |   |     | East/West Street           | Thixton Lane            |   |   |   |            |      |    |      |
| Analysis Year                                                                     | 2027                                  |      |     |   |           |   |     | North/South Street         | Pebble Trace            |   |   |   |            |      |    |      |
| Time Analyzed                                                                     | PM Peak Build                         |      |     |   |           |   |     | Peak Hour Factor           | 0.92                    |   |   |   |            |      |    |      |
| Intersection Orientation                                                          | East-West                             |      |     |   |           |   |     | Analysis Time Period (hrs) | 0.25                    |   |   |   |            |      |    |      |
| Project Description                                                               | Oak Grove                             |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| <b>Lanes</b>                                                                      |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
|  |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| <b>Vehicle Volumes and Adjustments</b>                                            |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Approach                                                                          | Eastbound                             |      |     |   | Westbound |   |     |                            | Northbound              |   |   |   | Southbound |      |    |      |
| Movement                                                                          | U                                     | L    | T   | R | U         | L | T   | R                          | U                       | L | T | R | U          | L    | T  | R    |
| Priority                                                                          | 1U                                    | 1    | 2   | 3 | 4U        | 4 | 5   | 6                          |                         | 7 | 8 | 9 |            | 10   | 11 | 12   |
| Number of Lanes                                                                   | 0                                     | 0    | 1   | 0 | 0         | 0 | 1   | 0                          |                         | 0 | 0 | 0 |            | 0    | 1  | 0    |
| Configuration                                                                     |                                       | LT   |     |   |           |   |     | TR                         |                         |   |   |   |            |      | LR |      |
| Volume (veh/h)                                                                    |                                       | 33   | 200 |   |           |   | 151 | 52                         |                         |   |   |   |            | 29   |    | 15   |
| Percent Heavy Vehicles (%)                                                        |                                       | 5    |     |   |           |   |     |                            |                         |   |   |   |            | 5    |    | 11   |
| Proportion Time Blocked                                                           |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Percent Grade (%)                                                                 |                                       |      |     |   |           |   |     |                            |                         |   |   |   | 0          |      |    |      |
| Right Turn Channelized                                                            |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Median Type   Storage                                                             | Undivided                             |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| <b>Critical and Follow-up Headways</b>                                            |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Base Critical Headway (sec)                                                       |                                       | 4.1  |     |   |           |   |     |                            |                         |   |   |   |            | 7.1  |    | 6.2  |
| Critical Headway (sec)                                                            |                                       | 4.15 |     |   |           |   |     |                            |                         |   |   |   |            | 6.45 |    | 6.31 |
| Base Follow-Up Headway (sec)                                                      |                                       | 2.2  |     |   |           |   |     |                            |                         |   |   |   |            | 3.5  |    | 3.3  |
| Follow-Up Headway (sec)                                                           |                                       | 2.25 |     |   |           |   |     |                            |                         |   |   |   |            | 3.55 |    | 3.40 |
| <b>Delay, Queue Length, and Level of Service</b>                                  |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Flow Rate, v (veh/h)                                                              |                                       | 36   |     |   |           |   |     |                            |                         |   |   |   |            | 48   |    |      |
| Capacity, c (veh/h)                                                               |                                       | 1331 |     |   |           |   |     |                            |                         |   |   |   |            | 597  |    |      |
| v/c Ratio                                                                         |                                       | 0.03 |     |   |           |   |     |                            |                         |   |   |   |            | 0.08 |    |      |
| 95% Queue Length, Q <sub>95</sub> (veh)                                           |                                       | 0.1  |     |   |           |   |     |                            |                         |   |   |   |            | 0.3  |    |      |
| Control Delay (s/veh)                                                             |                                       | 7.8  |     |   |           |   |     |                            |                         |   |   |   |            | 11.6 |    |      |
| Level of Service (LOS)                                                            |                                       | A    |     |   |           |   |     |                            |                         |   |   |   |            | B    |    |      |
| Approach Delay (s/veh)                                                            | 1.3                                   |      |     |   |           |   |     |                            |                         |   |   |   | 11.6       |      |    |      |
| Approach LOS                                                                      |                                       |      |     |   |           |   |     |                            |                         |   |   |   | B          |      |    |      |



Oak Grove Subdivision  
Traffic Impact Study

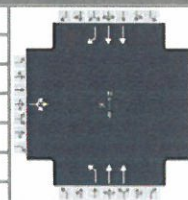
| HCS7 Signalized Intersection Results Summary    |       |                                        |     |               |      |                   |                          |                 |       |         |                                                                                     |   |       |       |    |
|-------------------------------------------------|-------|----------------------------------------|-----|---------------|------|-------------------|--------------------------|-----------------|-------|---------|-------------------------------------------------------------------------------------|---|-------|-------|----|
| General Information                             |       |                                        |     |               |      |                   | Intersection Information |                 |       |         |  |   |       |       |    |
| Agency                                          |       | Diane B. Zimmerman Traffic Engineering |     |               |      |                   | Duration, h              |                 | 0.250 |         |                                                                                     |   |       |       |    |
| Analyst                                         |       | DBZ                                    |     | Analysis Date |      | 9/19/2021         |                          | Area Type       |       | Other   |                                                                                     |   |       |       |    |
| Jurisdiction                                    |       |                                        |     | Time Period   |      | AM Peak           |                          | PHF             |       | 0.94    |                                                                                     |   |       |       |    |
| Urban Street                                    |       | Bardstown Road                         |     | Analysis Year |      | 2021              |                          | Analysis Period |       | 1> 7:00 |                                                                                     |   |       |       |    |
| Intersection                                    |       | Thixton                                |     | File Name     |      | Thixton AM 21.xus |                          |                 |       |         |                                                                                     |   |       |       |    |
| Project Description                             |       | Oak Grove                              |     |               |      |                   |                          |                 |       |         |                                                                                     |   |       |       |    |
| Demand Information                              |       |                                        |     | EB            |      |                   | WB                       |                 |       | NB      |                                                                                     |   | SB    |       |    |
| Approach Movement                               |       |                                        |     | L             | T    | R                 | L                        | T               | R     | L       | T                                                                                   | R | L     | T     | R  |
| Demand ( v ), veh/h                             |       |                                        |     | 97            | 0    | 53                |                          |                 |       | 231     | 1587                                                                                |   |       | 758   | 56 |
| Signal Information                              |       |                                        |     |               |      |                   |                          |                 |       |         |                                                                                     |   |       |       |    |
| Cycle, s                                        | 120.0 | Reference Phase                        | 2   |               |      |                   |                          |                 |       |         |                                                                                     |   |       |       |    |
| Offset, s                                       | 0     | Reference Point                        | End | Green         | 8.8  | 67.6              | 23.4                     | 0.0             | 0.0   | 0.0     |                                                                                     |   |       |       |    |
| Uncoordinated                                   | No    | Simult. Gap E/W                        | On  | Yellow        | 3.6  | 5.0               | 3.6                      | 0.0             | 0.0   | 0.0     |                                                                                     |   |       |       |    |
| Force Mode                                      | Fixed | Simult. Gap N/S                        | On  | Red           | 3.0  | 2.0               | 3.0                      | 0.0             | 0.0   | 0.0     |                                                                                     |   |       |       |    |
| Timer Results                                   |       |                                        |     | EBL           | EBT  | WBL               | WBT                      | NBL             | NBT   | SBL     | SBT                                                                                 |   |       |       |    |
| Assigned Phase                                  |       |                                        |     |               | 4    |                   |                          | 5               | 2     |         | 6                                                                                   |   |       |       |    |
| Case Number                                     |       |                                        |     |               | 12.0 |                   |                          | 1.0             | 4.0   |         | 7.3                                                                                 |   |       |       |    |
| Phase Duration, s                               |       |                                        |     |               | 30.0 |                   |                          | 15.4            | 90.0  |         | 74.6                                                                                |   |       |       |    |
| Change Period, ( Y+R c ), s                     |       |                                        |     |               | 6.6  |                   |                          | 6.6             | 7.0   |         | 7.0                                                                                 |   |       |       |    |
| Max Allow Headway ( MAH ), s                    |       |                                        |     |               | 3.2  |                   |                          | 3.0             | 0.0   |         | 0.0                                                                                 |   |       |       |    |
| Queue Clearance Time ( g s ), s                 |       |                                        |     |               | 25.4 |                   |                          | 8.7             |       |         |                                                                                     |   |       |       |    |
| Green Extension Time ( g e ), s                 |       |                                        |     |               | 0.0  |                   |                          | 0.2             | 0.0   |         | 0.0                                                                                 |   |       |       |    |
| Phase Call Probability                          |       |                                        |     |               | 1.00 |                   |                          | 1.00            |       |         |                                                                                     |   |       |       |    |
| Max Out Probability                             |       |                                        |     |               | 1.00 |                   |                          | 0.18            |       |         |                                                                                     |   |       |       |    |
| Movement Group Results                          |       |                                        |     | EB            |      |                   | WB                       |                 |       | NB      |                                                                                     |   | SB    |       |    |
| Approach Movement                               |       |                                        |     | L             | T    | R                 | L                        | T               | R     | L       | T                                                                                   | R | L     | T     | R  |
| Assigned Movement                               |       |                                        |     | 7             | 4    | 14                |                          |                 |       | 5       | 2                                                                                   |   | 6     | 16    |    |
| Adjusted Flow Rate ( v ), veh/h                 |       |                                        |     | 160           |      |                   |                          |                 |       | 246     | 1688                                                                                |   | 806   | 60    |    |
| Adjusted Saturation Flow Rate ( s ), veh/h/ln   |       |                                        |     | 1707          |      |                   |                          |                 |       | 1781    | 1766                                                                                |   | 1724  | 1547  |    |
| Queue Service Time ( g s ), s                   |       |                                        |     | 10.0          |      |                   |                          |                 |       | 6.7     | 33.9                                                                                |   | 16.0  | 2.1   |    |
| Cycle Queue Clearance Time ( g c ), s           |       |                                        |     | 10.0          |      |                   |                          |                 |       | 6.7     | 33.9                                                                                |   | 16.0  | 2.1   |    |
| Green Ratio ( g/C )                             |       |                                        |     | 0.20          |      |                   |                          |                 |       | 0.65    | 0.69                                                                                |   | 0.56  | 0.56  |    |
| Capacity ( c ), veh/h                           |       |                                        |     | 333           |      |                   |                          |                 |       | 481     | 2444                                                                                |   | 1941  | 871   |    |
| Volume-to-Capacity Ratio ( X )                  |       |                                        |     | 0.479         |      |                   |                          |                 |       | 0.510   | 0.691                                                                               |   | 0.415 | 0.068 |    |
| Back of Queue ( Q ), ft/ln ( 95 th percentile)  |       |                                        |     | 192.6         |      |                   |                          |                 |       | 102.7   | 422.7                                                                               |   | 257   | 32.9  |    |
| Back of Queue ( Q ), veh/ln ( 95 th percentile) |       |                                        |     | 7.6           |      |                   |                          |                 |       | 4.0     | 16.5                                                                                |   | 9.8   | 1.3   |    |
| Queue Storage Ratio ( RQ ) ( 95 th percentile)  |       |                                        |     | 0.00          |      |                   |                          |                 |       | 0.34    | 0.00                                                                                |   | 0.00  | 0.00  |    |
| Uniform Delay ( d 1 ), s/veh                    |       |                                        |     | 42.9          |      |                   |                          |                 |       | 10.5    | 10.9                                                                                |   | 15.0  | 11.9  |    |
| Incremental Delay ( d 2 ), s/veh                |       |                                        |     | 0.4           |      |                   |                          |                 |       | 0.3     | 1.6                                                                                 |   | 0.7   | 0.2   |    |
| Initial Queue Delay ( d 3 ), s/veh              |       |                                        |     | 0.0           |      |                   |                          |                 |       | 0.0     | 0.0                                                                                 |   | 0.0   | 0.0   |    |
| Control Delay ( d ), s/veh                      |       |                                        |     | 43.3          |      |                   |                          |                 |       | 10.8    | 12.6                                                                                |   | 15.6  | 12.1  |    |
| Level of Service (LOS)                          |       |                                        |     |               | D    |                   |                          |                 |       | B       | B                                                                                   |   | B     | B     |    |
| Approach Delay, s/veh / LOS                     |       |                                        |     | 43.3          |      | D                 |                          | 0.0             |       | 12.3    |                                                                                     | B | 15.4  |       | B  |
| Intersection Delay, s/veh / LOS                 |       |                                        |     | 14.9          |      |                   |                          |                 | B     |         |                                                                                     |   |       |       |    |
| Multimodal Results                              |       |                                        |     | EB            |      |                   | WB                       |                 |       | NB      |                                                                                     |   | SB    |       |    |
| Pedestrian LOS Score / LOS                      |       |                                        |     | 2.33          |      | B                 | 2.32                     |                 | B     | 1.35    |                                                                                     | A | 1.67  |       | B  |
| Bicycle LOS Score / LOS                         |       |                                        |     | 0.75          |      | A                 |                          |                 |       | 2.08    |                                                                                     | B | 1.20  |       | A  |



### HCS7 Signalized Intersection Results Summary

#### General Information

|                     |                                        |               |                      |                 |         |
|---------------------|----------------------------------------|---------------|----------------------|-----------------|---------|
| Agency              | Diane B. Zimmerman Traffic Engineering |               |                      | Duration, h     | 0.250   |
| Analyst             | DBZ                                    | Analysis Date | 9/19/2021            | Area Type       | Other   |
| Jurisdiction        |                                        | Time Period   | AM Peak              | PHF             | 0.94    |
| Urban Street        | Bardstown Road                         | Analysis Year | 2027 No Build        | Analysis Period | 1> 7:00 |
| Intersection        | Thixton                                | File Name     | Thixton AM 27 NB.xus |                 |         |
| Project Description | Oak Grove                              |               |                      |                 |         |



#### Demand Information

|                   | EB  |   |    | WB |   |   | NB  |      |   | SB |     |    |
|-------------------|-----|---|----|----|---|---|-----|------|---|----|-----|----|
| Approach Movement | L   | T | R  | L  | T | R | L   | T    | R | L  | T   | R  |
| Demand (v), veh/h | 109 | 0 | 60 |    |   |   | 260 | 1685 |   |    | 805 | 63 |

#### Signal Information

|               |       |                 |     |        |     |      |      |     |     |     |  |  |
|---------------|-------|-----------------|-----|--------|-----|------|------|-----|-----|-----|--|--|
| Cycle, s      | 120.0 | Reference Phase | 2   |        |     |      |      |     |     |     |  |  |
| Offset, s     | 0     | Reference Point | End |        |     |      |      |     |     |     |  |  |
| Uncoordinated | No    | Simult. Gap E/W | On  | Green  | 9.8 | 66.6 | 23.4 | 0.0 | 0.0 | 0.0 |  |  |
| Force Mode    | Fixed | Simult. Gap N/S | On  | Yellow | 3.6 | 5.0  | 3.6  | 0.0 | 0.0 | 0.0 |  |  |
|               |       |                 |     | Red    | 3.0 | 2.0  | 3.0  | 0.0 | 0.0 | 0.0 |  |  |

#### Timer Results

|                                           | EBL | EBT  | WBL | WBT | NBL  | NBT  | SBL | SBT  |
|-------------------------------------------|-----|------|-----|-----|------|------|-----|------|
| Assigned Phase                            |     | 4    |     |     | 5    | 2    |     | 6    |
| Case Number                               |     | 12.0 |     |     | 1.0  | 4.0  |     | 7.3  |
| Phase Duration, s                         |     | 30.0 |     |     | 16.4 | 90.0 |     | 73.6 |
| Change Period, (Y+R), s                   |     | 6.6  |     |     | 6.6  | 7.0  |     | 7.0  |
| Max Allow Headway (MAH), s                |     | 3.2  |     |     | 3.0  | 0.0  |     | 0.0  |
| Queue Clearance Time (g <sub>s</sub> ), s |     | 25.4 |     |     | 9.6  |      |     |      |
| Green Extension Time (g <sub>e</sub> ), s |     | 0.0  |     |     | 0.2  | 0.0  |     | 0.0  |
| Phase Call Probability                    |     | 1.00 |     |     | 1.00 |      |     |      |
| Max Out Probability                       |     | 1.00 |     |     | 0.49 |      |     |      |

#### Movement Group Results

|                                                 | EB    |   |    | WB  |   |   | NB    |       |   | SB    |       |   |
|-------------------------------------------------|-------|---|----|-----|---|---|-------|-------|---|-------|-------|---|
| Approach Movement                               | L     | T | R  | L   | T | R | L     | T     | R | L     | T     | R |
| Assigned Movement                               | 7     | 4 | 14 |     |   |   | 5     | 2     |   | 6     | 16    |   |
| Adjusted Flow Rate (v), veh/h                   | 180   |   |    |     |   |   | 277   | 1793  |   | 856   | 67    |   |
| Adjusted Saturation Flow Rate (s), veh/h/in     | 1706  |   |    |     |   |   | 1781  | 1766  |   | 1724  | 1547  |   |
| Queue Service Time (g <sub>s</sub> ), s         | 11.4  |   |    |     |   |   | 7.6   | 38.1  |   | 17.7  | 2.4   |   |
| Cycle Queue Clearance Time (g <sub>c</sub> ), s | 11.4  |   |    |     |   |   | 7.6   | 38.1  |   | 17.7  | 2.4   |   |
| Green Ratio (g/C)                               | 0.20  |   |    |     |   |   | 0.65  | 0.69  |   | 0.55  | 0.55  |   |
| Capacity (c), veh/h                             | 333   |   |    |     |   |   | 469   | 2444  |   | 1913  | 858   |   |
| Volume-to-Capacity Ratio (X)                    | 0.540 |   |    |     |   |   | 0.590 | 0.734 |   | 0.448 | 0.078 |   |
| Back of Queue (Q), ft/in (95 th percentile)     | 215.3 |   |    |     |   |   | 120.4 | 468.5 |   | 279.6 | 38.3  |   |
| Back of Queue (Q), veh/in (95 th percentile)    | 8.5   |   |    |     |   |   | 4.7   | 18.3  |   | 10.7  | 1.5   |   |
| Queue Storage Ratio (RQ) (95 th percentile)     | 0.00  |   |    |     |   |   | 0.40  | 0.00  |   | 0.00  | 0.00  |   |
| Uniform Delay (d <sub>1</sub> ), s/veh          | 43.5  |   |    |     |   |   | 11.4  | 11.6  |   | 15.8  | 12.4  |   |
| Incremental Delay (d <sub>2</sub> ), s/veh      | 1.0   |   |    |     |   |   | 0.7   | 2.0   |   | 0.8   | 0.2   |   |
| Initial Queue Delay (d <sub>3</sub> ), s/veh    | 0.0   |   |    |     |   |   | 0.0   | 0.0   |   | 0.0   | 0.0   |   |
| Control Delay (d), s/veh                        | 44.4  |   |    |     |   |   | 12.1  | 13.6  |   | 16.6  | 12.6  |   |
| Level of Service (LOS)                          | D     |   |    |     |   |   | B     | B     |   | B     | B     |   |
| Approach Delay, s/veh / LOS                     | 44.4  | D |    | 0.0 |   |   | 13.4  | B     |   | 16.3  | B     |   |
| Intersection Delay, s/veh / LOS                 | 16.0  |   |    |     |   |   | B     |       |   |       |       |   |

#### Multimodal Results

|                            | EB   |   | WB   |   | NB   |   | SB   |   |
|----------------------------|------|---|------|---|------|---|------|---|
| Pedestrian LOS Score / LOS | 2.33 | B | 2.32 | B | 1.35 | A | 1.67 | B |
| Bicycle LOS Score / LOS    | 0.78 | A |      |   | 2.19 | B | 1.25 | A |

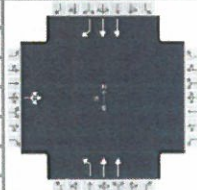


Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Signalized Intersection Results Summary    |                                        |                 |               |                     |       |                 |                          |       |       |       |      |       |       |     |    |  |
|-------------------------------------------------|----------------------------------------|-----------------|---------------|---------------------|-------|-----------------|--------------------------|-------|-------|-------|------|-------|-------|-----|----|--|
| General Information                             |                                        |                 |               |                     |       |                 | Intersection Information |       |       |       |      |       |       |     |    |  |
| Agency                                          | Diane B. Zimmerman Traffic Engineering |                 |               |                     |       |                 | Duration, h              | 0.250 |       |       |      |       |       |     |    |  |
| Analyst                                         | DBZ                                    |                 | Analysis Date | 9/19/2021           |       | Area Type       | Other                    |       |       |       |      |       |       |     |    |  |
| Jurisdiction                                    |                                        |                 | Time Period   | AM Peak             |       | PHF             | 0.94                     |       |       |       |      |       |       |     |    |  |
| Urban Street                                    | Bardstown Road                         |                 | Analysis Year | 2027 Build          |       | Analysis Period | 1> 7:00                  |       |       |       |      |       |       |     |    |  |
| Intersection                                    | Thixton                                |                 | File Name     | Thixton AM 27 B.xus |       |                 |                          |       |       |       |      |       |       |     |    |  |
| Project Description                             | Oak Grove                              |                 |               |                     |       |                 |                          |       |       |       |      |       |       |     |    |  |
| Demand Information                              |                                        |                 |               | EB                  |       |                 | WB                       |       |       | NB    |      |       | SB    |     |    |  |
| Approach Movement                               |                                        |                 |               | L                   | T     | R               | L                        | T     | R     | L     | T    | R     | L     | T   | R  |  |
| Demand ( v ), veh/h                             |                                        |                 |               | 156                 | 0     | 85              |                          |       |       | 279   | 1685 |       |       | 805 | 68 |  |
| Signal Information                              |                                        |                 |               |                     |       |                 |                          |       |       |       |      |       |       |     |    |  |
| Cycle, s                                        | 120.0                                  | Reference Phase | 2             |                     |       |                 |                          |       |       |       |      |       |       |     |    |  |
| Offset, s                                       | 0                                      | Reference Point | End           |                     |       |                 |                          |       |       |       |      |       |       |     |    |  |
| Uncoordinated                                   | No                                     | Simult. Gap E/W | On            | Green               | 9.9   | 70.0            | 19.9                     | 0.0   | 0.0   | 0.0   | 0.0  |       |       |     |    |  |
| Force Mode                                      | Fixed                                  | Simult. Gap N/S | On            | Yellow              | 3.6   | 5.0             | 3.6                      | 0.0   | 0.0   | 0.0   | 0.0  |       |       |     |    |  |
|                                                 |                                        |                 |               | Red                 | 3.0   | 2.0             | 3.0                      | 0.0   | 0.0   | 0.0   | 0.0  |       |       |     |    |  |
| Timer Results                                   |                                        |                 |               | EBL                 | EBT   | WBL             | WBT                      | NBL   | NBT   | SBL   | SBT  |       |       |     |    |  |
| Assigned Phase                                  |                                        |                 |               |                     | 4     |                 |                          | 5     | 2     |       | 6    |       |       |     |    |  |
| Case Number                                     |                                        |                 |               |                     | 12.0  |                 |                          | 1.0   | 4.0   |       | 7.3  |       |       |     |    |  |
| Phase Duration, s                               |                                        |                 |               |                     | 26.5  |                 |                          | 16.5  | 93.5  |       | 77.0 |       |       |     |    |  |
| Change Period, ( Y+R c ), s                     |                                        |                 |               |                     | 6.6   |                 |                          | 6.6   | 7.0   |       | 7.0  |       |       |     |    |  |
| Max Allow Headway ( MAH ), s                    |                                        |                 |               |                     | 3.2   |                 |                          | 3.0   | 0.0   |       | 0.0  |       |       |     |    |  |
| Queue Clearance Time ( g s ), s                 |                                        |                 |               |                     | 19.7  |                 |                          | 9.6   |       |       |      |       |       |     |    |  |
| Green Extension Time ( g e ), s                 |                                        |                 |               |                     | 0.2   |                 |                          | 0.3   | 0.0   |       | 0.0  |       |       |     |    |  |
| Phase Call Probability                          |                                        |                 |               |                     | 1.00  |                 |                          | 1.00  |       |       |      |       |       |     |    |  |
| Max Out Probability                             |                                        |                 |               |                     | 0.66  |                 |                          | 0.02  |       |       |      |       |       |     |    |  |
| Movement Group Results                          |                                        |                 |               | EB                  |       |                 | WB                       |       |       | NB    |      |       | SB    |     |    |  |
| Approach Movement                               |                                        |                 |               | L                   | T     | R               | L                        | T     | R     | L     | T    | R     | L     | T   | R  |  |
| Assigned Movement                               |                                        |                 |               | 7                   | 4     | 14              |                          |       |       | 5     | 2    |       | 6     | 16  |    |  |
| Adjusted Flow Rate ( v ), veh/h                 |                                        |                 |               |                     | 256   |                 |                          |       | 297   | 1793  |      | 856   | 72    |     |    |  |
| Adjusted Saturation Flow Rate ( s ), veh/h/ln   |                                        |                 |               |                     | 1707  |                 |                          |       | 1781  | 1766  |      | 1724  | 1547  |     |    |  |
| Queue Service Time ( g s ), s                   |                                        |                 |               |                     | 17.7  |                 |                          |       | 7.6   | 34.5  |      | 16.5  | 2.5   |     |    |  |
| Cycle Queue Clearance Time ( g c ), s           |                                        |                 |               |                     | 17.7  |                 |                          |       | 7.6   | 34.5  |      | 16.5  | 2.5   |     |    |  |
| Green Ratio ( g/C )                             |                                        |                 |               |                     | 0.17  |                 |                          |       | 0.68  | 0.72  |      | 0.58  | 0.58  |     |    |  |
| Capacity ( c ), veh/h                           |                                        |                 |               |                     | 283   |                 |                          |       | 495   | 2547  |      | 2011  | 902   |     |    |  |
| Volume-to-Capacity Ratio ( X )                  |                                        |                 |               |                     | 0.907 |                 |                          |       | 0.600 | 0.704 |      | 0.426 | 0.080 |     |    |  |
| Back of Queue ( Q ), ft/ln ( 95 th percentile)  |                                        |                 |               |                     | 362.2 |                 |                          |       | 112.8 | 408.7 |      | 260.4 | 38    |     |    |  |
| Back of Queue ( Q ), veh/ln ( 95 th percentile) |                                        |                 |               |                     | 14.3  |                 |                          |       | 4.4   | 16.0  |      | 9.9   | 1.5   |     |    |  |
| Queue Storage Ratio ( RQ ) ( 95 th percentile)  |                                        |                 |               |                     | 0.00  |                 |                          |       | 0.38  | 0.00  |      | 0.00  | 0.00  |     |    |  |
| Uniform Delay ( d 1 ), s/veh                    |                                        |                 |               |                     | 49.1  |                 |                          |       | 9.9   | 9.5   |      | 13.9  | 10.9  |     |    |  |
| Incremental Delay ( d 2 ), s/veh                |                                        |                 |               |                     | 23.0  |                 |                          |       | 0.4   | 1.7   |      | 0.7   | 0.2   |     |    |  |
| Initial Queue Delay ( d 3 ), s/veh              |                                        |                 |               |                     | 0.0   |                 |                          |       | 0.0   | 0.0   |      | 0.0   | 0.0   |     |    |  |
| Control Delay ( d ), s/veh                      |                                        |                 |               |                     | 72.2  |                 |                          |       | 10.3  | 11.1  |      | 14.5  | 11.1  |     |    |  |
| Level of Service (LOS)                          |                                        |                 |               |                     | E     |                 |                          |       | B     | B     |      | B     | B     |     |    |  |
| Approach Delay, s/veh / LOS                     |                                        |                 |               | 72.2                | E     |                 | 0.0                      |       | 11.0  | B     |      | 14.3  | B     |     |    |  |
| Intersection Delay, s/veh / LOS                 |                                        |                 |               | 16.7                |       |                 |                          |       | B     |       |      |       |       |     |    |  |
| Multimodal Results                              |                                        |                 |               | EB                  |       |                 | WB                       |       |       | NB    |      |       | SB    |     |    |  |
| Pedestrian LOS Score / LOS                      |                                        |                 |               | 2.33                | B     |                 | 2.32                     | B     |       | 1.34  | A    |       | 1.67  | B   |    |  |
| Bicycle LOS Score / LOS                         |                                        |                 |               | 0.91                | A     |                 |                          |       | 2.21  | B     |      | 1.25  | A     |     |    |  |



### HCS7 Signalized Intersection Results Summary

| General Information                             |                                        |                 |                   | Intersection Information |                                                                                   |                                                                                   |      |  |     |       |                                                                                     |                                                                                     |       |                                                                                     |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
|-------------------------------------------------|----------------------------------------|-----------------|-------------------|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-----|-------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|--|--|-------|--|--|-----|--|--|------|--|--|
| Agency                                          | Diane B. Zimmerman Traffic Engineering |                 |                   | Duration, h              | 0.250                                                                             |                                                                                   |      |                                                                                     |     |       |                                                                                     |                                                                                     |       |                                                                                     |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Analyst                                         | DBZ                                    | Analysis Date   | 9/19/2021         | Area Type                | Other                                                                             |                                                                                   |      |                                                                                     |     |       |                                                                                     |                                                                                     |       |                                                                                     |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Jurisdiction                                    |                                        | Time Period     | PM Peak           | PHF                      | 0.98                                                                              |                                                                                   |      |                                                                                     |     |       |                                                                                     |                                                                                     |       |                                                                                     |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Urban Street                                    | Bardstown Road                         | Analysis Year   | 2021              | Analysis Period          | 1> 4:45                                                                           |                                                                                   |      |                                                                                     |     |       |                                                                                     |                                                                                     |       |                                                                                     |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Intersection                                    | Thixton                                | File Name       | Thixton PM 21.xus |                          |                                                                                   |                                                                                   |      |                                                                                     |     |       |                                                                                     |                                                                                     |       |                                                                                     |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Project Description                             | Oak Grove                              |                 |                   |                          |                                                                                   |                                                                                   |      |                                                                                     |     |       |                                                                                     |                                                                                     |       |                                                                                     |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Demand Information                              |                                        |                 |                   | EB                       |                                                                                   |                                                                                   | WB   |                                                                                     |     | NB    |                                                                                     |                                                                                     | SB    |                                                                                     |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Approach Movement                               |                                        |                 |                   | L                        | T                                                                                 | R                                                                                 | L    | T                                                                                   | R   | L     | T                                                                                   | R                                                                                   | L     | T                                                                                   | R                                                                                   |      |  |  |       |  |  |     |  |  |      |  |  |
| Demand ( v ), veh/h                             |                                        |                 |                   | 106                      | 0                                                                                 | 211                                                                               |      |                                                                                     |     | 97    | 1035                                                                                |                                                                                     |       | 1841                                                                                | 137                                                                                 |      |  |  |       |  |  |     |  |  |      |  |  |
| Signal Information                              |                                        |                 |                   |                          |  |  |      |                                                                                     |     |       |  |  |       |  |  |      |  |  |       |  |  |     |  |  |      |  |  |
| Cycle, s                                        | 140.0                                  | Reference Phase | 2                 | Green                    | 5.9                                                                               | 80.5                                                                              | 33.4 | 0.0                                                                                 | 0.0 | 0.0   |                                                                                     |                                                                                     |       |                                                                                     |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Offset, s                                       | 0                                      | Reference Point | End               | Yellow                   | 3.6                                                                               | 5.0                                                                               | 3.6  | 0.0                                                                                 | 0.0 | 0.0   |                                                                                     |                                                                                     |       |                                                                                     |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Uncoordinated                                   | No                                     | Simult. Gap E/W | On                | Red                      | 3.0                                                                               | 5.0                                                                               | 3.6  | 0.0                                                                                 | 0.0 | 0.0   |                                                                                     |                                                                                     |       |                                                                                     |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Force Mode                                      | Fixed                                  | Simult. Gap N/S | On                | Red                      | 3.0                                                                               | 2.0                                                                               | 3.0  | 0.0                                                                                 | 0.0 | 0.0   |                                                                                     |                                                                                     |       |                                                                                     |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Timer Results                                   |                                        |                 |                   | EBL                      |                                                                                   |                                                                                   | EBT  |                                                                                     |     | WBL   |                                                                                     |                                                                                     | WBT   |                                                                                     |                                                                                     | NBL  |  |  | NBT   |  |  | SBL |  |  | SBT  |  |  |
| Assigned Phase                                  |                                        |                 |                   |                          |                                                                                   |                                                                                   | 4    |                                                                                     |     |       |                                                                                     |                                                                                     |       |                                                                                     |                                                                                     | 5    |  |  | 2     |  |  |     |  |  | 6    |  |  |
| Case Number                                     |                                        |                 |                   |                          |                                                                                   |                                                                                   | 12.0 |                                                                                     |     |       |                                                                                     |                                                                                     |       |                                                                                     |                                                                                     | 1.0  |  |  | 4.0   |  |  |     |  |  | 7.3  |  |  |
| Phase Duration, s                               |                                        |                 |                   |                          |                                                                                   |                                                                                   | 40.0 |                                                                                     |     |       |                                                                                     |                                                                                     |       |                                                                                     |                                                                                     | 12.5 |  |  | 100.0 |  |  |     |  |  | 87.5 |  |  |
| Change Period, ( Y+R c ), s                     |                                        |                 |                   |                          |                                                                                   |                                                                                   | 6.6  |                                                                                     |     |       |                                                                                     |                                                                                     |       |                                                                                     |                                                                                     | 6.6  |  |  | 7.0   |  |  |     |  |  | 7.0  |  |  |
| Max Allow Headway ( MAH ), s                    |                                        |                 |                   |                          |                                                                                   |                                                                                   | 3.3  |                                                                                     |     |       |                                                                                     |                                                                                     |       |                                                                                     |                                                                                     | 3.0  |  |  | 0.0   |  |  |     |  |  | 0.0  |  |  |
| Queue Clearance Time ( g s ), s                 |                                        |                 |                   |                          |                                                                                   |                                                                                   | 35.4 |                                                                                     |     |       |                                                                                     |                                                                                     |       |                                                                                     |                                                                                     | 5.0  |  |  |       |  |  |     |  |  |      |  |  |
| Green Extension Time ( g e ), s                 |                                        |                 |                   |                          |                                                                                   |                                                                                   | 0.0  |                                                                                     |     |       |                                                                                     |                                                                                     |       |                                                                                     |                                                                                     | 0.1  |  |  | 0.0   |  |  |     |  |  | 0.0  |  |  |
| Phase Call Probability                          |                                        |                 |                   |                          |                                                                                   |                                                                                   | 1.00 |                                                                                     |     |       |                                                                                     |                                                                                     |       |                                                                                     |                                                                                     | 0.98 |  |  |       |  |  |     |  |  |      |  |  |
| Max Out Probability                             |                                        |                 |                   |                          |                                                                                   |                                                                                   | 1.00 |                                                                                     |     |       |                                                                                     |                                                                                     |       |                                                                                     |                                                                                     | 0.00 |  |  |       |  |  |     |  |  |      |  |  |
| Movement Group Results                          |                                        |                 |                   | EB                       |                                                                                   |                                                                                   | WB   |                                                                                     |     | NB    |                                                                                     |                                                                                     | SB    |                                                                                     |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Approach Movement                               |                                        |                 |                   | L                        | T                                                                                 | R                                                                                 | L    | T                                                                                   | R   | L     | T                                                                                   | R                                                                                   | L     | T                                                                                   | R                                                                                   |      |  |  |       |  |  |     |  |  |      |  |  |
| Assigned Movement                               |                                        |                 |                   | 7                        | 4                                                                                 | 14                                                                                |      |                                                                                     |     | 5     | 2                                                                                   |                                                                                     | 6     | 16                                                                                  |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Adjusted Flow Rate ( v ), veh/h                 |                                        |                 |                   |                          | 323                                                                               |                                                                                   |      |                                                                                     |     | 99    | 1056                                                                                |                                                                                     | 1879  | 140                                                                                 |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Adjusted Saturation Flow Rate ( s ), veh/h/ln   |                                        |                 |                   |                          | 1620                                                                              |                                                                                   |      |                                                                                     |     | 1795  | 1781                                                                                |                                                                                     | 1795  | 1572                                                                                |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Queue Service Time ( g s ), s                   |                                        |                 |                   |                          | 26.6                                                                              |                                                                                   |      |                                                                                     |     | 3.0   | 19.8                                                                                |                                                                                     | 65.3  | 5.8                                                                                 |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Cycle Queue Clearance Time ( g c ), s           |                                        |                 |                   |                          | 26.6                                                                              |                                                                                   |      |                                                                                     |     | 3.0   | 19.8                                                                                |                                                                                     | 65.3  | 5.8                                                                                 |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Green Ratio ( g/C )                             |                                        |                 |                   |                          | 0.24                                                                              |                                                                                   |      |                                                                                     |     | 0.63  | 0.66                                                                                |                                                                                     | 0.58  | 0.58                                                                                |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Capacity ( c ), veh/h                           |                                        |                 |                   |                          | 386                                                                               |                                                                                   |      |                                                                                     |     | 153   | 2366                                                                                |                                                                                     | 2065  | 904                                                                                 |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Volume-to-Capacity Ratio ( X )                  |                                        |                 |                   |                          | 0.837                                                                             |                                                                                   |      |                                                                                     |     | 0.646 | 0.446                                                                               |                                                                                     | 0.910 | 0.155                                                                               |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Back of Queue ( Q ), ft/ln ( 95 th percentile)  |                                        |                 |                   |                          | 463.5                                                                             |                                                                                   |      |                                                                                     |     | 89.3  | 293.1                                                                               |                                                                                     | 901.9 | 94                                                                                  |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Back of Queue ( Q ), veh/ln ( 95 th percentile) |                                        |                 |                   |                          | 18.0                                                                              |                                                                                   |      |                                                                                     |     | 3.5   | 11.5                                                                                |                                                                                     | 35.8  | 3.7                                                                                 |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Queue Storage Ratio ( RQ ) ( 95 th percentile)  |                                        |                 |                   |                          | 0.00                                                                              |                                                                                   |      |                                                                                     |     | 0.30  | 0.00                                                                                |                                                                                     | 0.00  | 0.00                                                                                |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Uniform Delay ( d 1 ), s/veh                    |                                        |                 |                   |                          | 50.7                                                                              |                                                                                   |      |                                                                                     |     | 32.3  | 11.2                                                                                |                                                                                     | 26.5  | 13.9                                                                                |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Incremental Delay ( d 2 ), s/veh                |                                        |                 |                   |                          | 14.1                                                                              |                                                                                   |      |                                                                                     |     | 1.7   | 0.6                                                                                 |                                                                                     | 7.4   | 0.4                                                                                 |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Initial Queue Delay ( d 3 ), s/veh              |                                        |                 |                   |                          | 0.0                                                                               |                                                                                   |      |                                                                                     |     | 0.0   | 0.0                                                                                 |                                                                                     | 0.0   | 0.0                                                                                 |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Control Delay ( d ), s/veh                      |                                        |                 |                   |                          | 64.8                                                                              |                                                                                   |      |                                                                                     |     | 34.0  | 11.8                                                                                |                                                                                     | 33.9  | 14.2                                                                                |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Level of Service (LOS)                          |                                        |                 |                   |                          | E                                                                                 |                                                                                   |      |                                                                                     |     | C     | B                                                                                   |                                                                                     | C     | B                                                                                   |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Approach Delay, s/veh / LOS                     |                                        |                 |                   | 64.8                     | E                                                                                 |                                                                                   | 0.0  |                                                                                     |     | 13.7  | B                                                                                   |                                                                                     | 32.6  | C                                                                                   |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Intersection Delay, s/veh / LOS                 |                                        |                 |                   | 29.3                     |                                                                                   |                                                                                   |      |                                                                                     |     | C     |                                                                                     |                                                                                     |       |                                                                                     |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Multimodal Results                              |                                        |                 |                   | EB                       |                                                                                   |                                                                                   | WB   |                                                                                     |     | NB    |                                                                                     |                                                                                     | SB    |                                                                                     |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Pedestrian LOS Score / LOS                      |                                        |                 |                   | 2.33                     | B                                                                                 |                                                                                   | 2.33 | B                                                                                   |     | 1.36  | A                                                                                   |                                                                                     | 1.67  | B                                                                                   |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |
| Bicvcle LOS Score / LOS                         |                                        |                 |                   | 1.02                     | A                                                                                 |                                                                                   |      |                                                                                     |     | 1.44  | A                                                                                   |                                                                                     | 2.15  | B                                                                                   |                                                                                     |      |  |  |       |  |  |     |  |  |      |  |  |



Oak Grove Subdivision  
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### HCS7 Signalized Intersection Results Summary

| General Information                             |                                        |                 |               | Intersection Information |       |                 |         |      |       |       |       |   |      |       |       |
|-------------------------------------------------|----------------------------------------|-----------------|---------------|--------------------------|-------|-----------------|---------|------|-------|-------|-------|---|------|-------|-------|
| Agency                                          | Diane B. Zimmerman Traffic Engineering |                 |               |                          |       | Duration, h     | 0.250   |      |       |       |       |   |      |       |       |
| Analyst                                         | DBZ                                    |                 | Analysis Date | 9/19/2021                |       | Area Type       | Other   |      |       |       |       |   |      |       |       |
| Jurisdiction                                    |                                        |                 | Time Period   | PM Peak                  |       | PHF             | 0.98    |      |       |       |       |   |      |       |       |
| Urban Street                                    | Bardstown Road                         |                 | Analysis Year | 2027 No Build            |       | Analysis Period | 1> 4:45 |      |       |       |       |   |      |       |       |
| Intersection                                    | Thixton                                |                 | File Name     | Thixton PM 27 NB.xus     |       |                 |         |      |       |       |       |   |      |       |       |
| Project Description                             | Oak Grove                              |                 |               |                          |       |                 |         |      |       |       |       |   |      |       |       |
| Demand Information                              |                                        |                 |               | EB                       |       |                 | WB      |      |       | NB    |       |   | SB   |       |       |
| Approach Movement                               |                                        |                 |               | L                        | T     | R               | L       | T    | R     | L     | T     | R | L    | T     | R     |
| Demand ( v ), veh/h                             |                                        |                 |               | 119                      | 0     | 238             |         |      |       | 109   | 1099  |   |      | 1954  | 154   |
| Signal Information                              |                                        |                 |               |                          |       |                 |         |      |       |       |       |   |      |       |       |
| Cycle, s                                        | 170.0                                  | Reference Phase | 2             |                          |       |                 |         |      |       |       |       |   |      |       |       |
| Offset, s                                       | 0                                      | Reference Point | End           |                          |       |                 |         |      |       |       |       |   |      |       |       |
| Uncoordinated                                   | No                                     | Simult. Gap E/W | On            |                          |       |                 |         |      |       |       |       |   |      |       |       |
| Force Mode                                      | Fixed                                  | Simult. Gap N/S | On            |                          |       |                 |         |      |       |       |       |   |      |       |       |
|                                                 |                                        |                 |               | Green                    | 6.2   | 103.2           | 40.4    | 0.0  | 0.0   | 0.0   | 0.0   |   |      |       |       |
|                                                 |                                        |                 |               | Yellow                   | 3.6   | 5.0             | 3.6     | 0.0  | 0.0   | 0.0   | 0.0   |   |      |       |       |
|                                                 |                                        |                 |               | Red                      | 3.0   | 2.0             | 3.0     | 0.0  | 0.0   | 0.0   | 0.0   |   |      |       |       |
| Timer Results                                   |                                        |                 |               | EBL                      | EBT   | WBL             | WBT     | NBL  | NBT   | SBL   | SBT   |   |      |       |       |
| Assigned Phase                                  |                                        |                 |               |                          | 4     |                 |         | 5    | 2     |       | 6     |   |      |       |       |
| Case Number                                     |                                        |                 |               |                          | 12.0  |                 |         | 1.0  | 4.0   |       | 7.3   |   |      |       |       |
| Phase Duration, s                               |                                        |                 |               |                          | 47.0  |                 |         | 12.8 | 123.0 |       | 110.2 |   |      |       |       |
| Change Period, ( Y+R c ), s                     |                                        |                 |               |                          | 6.6   |                 |         | 6.6  | 7.0   |       | 7.0   |   |      |       |       |
| Max Allow Headway ( MAH ), s                    |                                        |                 |               |                          | 3.3   |                 |         | 3.0  | 0.0   |       | 0.0   |   |      |       |       |
| Queue Clearance Time ( g s ), s                 |                                        |                 |               |                          | 39.6  |                 |         | 6.0  |       |       |       |   |      |       |       |
| Green Extension Time ( g e ), s                 |                                        |                 |               |                          | 0.8   |                 |         | 0.2  | 0.0   |       | 0.0   |   |      |       |       |
| Phase Call Probability                          |                                        |                 |               |                          | 1.00  |                 |         | 0.99 |       |       |       |   |      |       |       |
| Max Out Probability                             |                                        |                 |               |                          | 0.00  |                 |         | 0.00 |       |       |       |   |      |       |       |
| Movement Group Results                          |                                        |                 |               | EB                       |       |                 | WB      |      |       | NB    |       |   | SB   |       |       |
| Approach Movement                               |                                        |                 |               | L                        | T     | R               | L       | T    | R     | L     | T     | R | L    | T     | R     |
| Assigned Movement                               |                                        |                 |               | 7                        | 4     | 14              |         |      |       | 5     | 2     |   |      | 6     | 16    |
| Adjusted Flow Rate ( v ), veh/h                 |                                        |                 |               |                          | 364   |                 |         |      |       | 111   | 1121  |   |      | 1994  | 157   |
| Adjusted Saturation Flow Rate ( s ), veh/h/ln   |                                        |                 |               |                          | 1619  |                 |         |      |       | 1795  | 1781  |   |      | 1795  | 1572  |
| Queue Service Time ( g s ), s                   |                                        |                 |               |                          | 37.6  |                 |         |      |       | 4.0   | 24.8  |   |      | 83.5  | 7.4   |
| Cycle Queue Clearance Time ( g c ), s           |                                        |                 |               |                          | 37.6  |                 |         |      |       | 4.0   | 24.8  |   |      | 83.5  | 7.4   |
| Green Ratio ( g/C )                             |                                        |                 |               |                          | 0.24  |                 |         |      |       | 0.66  | 0.68  |   |      | 0.61  | 0.61  |
| Capacity ( c ), veh/h                           |                                        |                 |               |                          | 385   |                 |         |      |       | 133   | 2430  |   |      | 2178  | 954   |
| Volume-to-Capacity Ratio ( X )                  |                                        |                 |               |                          | 0.946 |                 |         |      |       | 0.836 | 0.462 |   |      | 0.915 | 0.165 |
| Back of Queue ( Q ), ft/ln ( 95 th percentile)  |                                        |                 |               |                          | 582.9 |                 |         |      |       | 136.9 | 367.1 |   |      | 1139  | 123.6 |
| Back of Queue ( Q ), veh/ln ( 95 th percentile) |                                        |                 |               |                          | 22.6  |                 |         |      |       | 5.4   | 14.5  |   |      | 45.2  | 4.8   |
| Queue Storage Ratio ( RQ ) ( 95 th percentile)  |                                        |                 |               |                          | 0.00  |                 |         |      |       | 0.46  | 0.00  |   |      | 0.00  | 0.00  |
| Uniform Delay ( d 1 ), s/veh                    |                                        |                 |               |                          | 63.7  |                 |         |      |       | 41.9  | 12.5  |   |      | 29.6  | 14.6  |
| Incremental Delay ( d 2 ), s/veh                |                                        |                 |               |                          | 5.4   |                 |         |      |       | 5.2   | 0.6   |   |      | 7.5   | 0.4   |
| Initial Queue Delay ( d 3 ), s/veh              |                                        |                 |               |                          | 0.0   |                 |         |      |       | 0.0   | 0.0   |   |      | 0.0   | 0.0   |
| Control Delay ( d ), s/veh                      |                                        |                 |               |                          | 69.1  |                 |         |      |       | 47.1  | 13.2  |   |      | 37.0  | 15.0  |
| Level of Service (LOS)                          |                                        |                 |               |                          | E     |                 |         |      |       | D     | B     |   |      | D     | B     |
| Approach Delay, s/veh / LOS                     |                                        |                 |               | 69.1                     | E     |                 | 0.0     |      |       | 16.2  | B     |   | 35.4 | D     |       |
| Intersection Delay, s/veh / LOS                 |                                        |                 |               | 32.4                     |       |                 |         |      | C     |       |       |   |      |       |       |
| Multimodal Results                              |                                        |                 |               | EB                       |       |                 | WB      |      |       | NB    |       |   | SB   |       |       |
| Pedestrian LOS Score / LOS                      |                                        |                 |               | 2.34                     | B     |                 | 2.34    | B    |       | 1.37  | A     |   | 1.68 | B     |       |
| Bicycle LOS Score / LOS                         |                                        |                 |               | 1.09                     | A     |                 |         |      |       | 1.50  | B     |   | 2.26 | B     |       |



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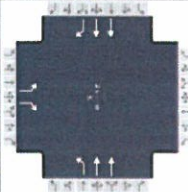
### HCS7 Signalized Intersection Results Summary

| General Information                             |       |                                        |     |               |  | Intersection Information |      |                 |     |         |     |             |      |      |              |       |     |      |  |      |  |
|-------------------------------------------------|-------|----------------------------------------|-----|---------------|--|--------------------------|------|-----------------|-----|---------|-----|-------------|------|------|--------------|-------|-----|------|--|------|--|
| Agency                                          |       | Diane B. Zimmerman Traffic Engineering |     |               |  | Duration, h              |      | 0.250           |     |         |     |             |      |      |              |       |     |      |  |      |  |
| Analyst                                         |       | DBZ                                    |     | Analysis Date |  | 9/19/2021                |      | Area Type       |     | Other   |     |             |      |      |              |       |     |      |  |      |  |
| Jurisdiction                                    |       |                                        |     | Time Period   |  | PM Peak                  |      | PHF             |     | 0.98    |     |             |      |      |              |       |     |      |  |      |  |
| Urban Street                                    |       | Bardstown Road                         |     | Analysis Year |  | 2027 Build               |      | Analysis Period |     | 1> 4:45 |     |             |      |      |              |       |     |      |  |      |  |
| Intersection                                    |       | Thlxton                                |     | File Name     |  | Thlxton PM 27 B.xus      |      |                 |     |         |     |             |      |      |              |       |     |      |  |      |  |
| Project Description                             |       | Oak Grove                              |     |               |  |                          |      |                 |     |         |     |             |      |      |              |       |     |      |  |      |  |
| Demand Information                              |       |                                        |     |               |  | EB                       |      |                 | WB  |         |     | NB          |      |      | SB           |       |     |      |  |      |  |
| Approach Movement                               |       |                                        |     |               |  | L                        | T    | R               | L   | T       | R   | L           | T    | R    | L            | T     | R   |      |  |      |  |
| Demand ( v ), veh/h                             |       |                                        |     |               |  | 135                      | 0    | 269             |     |         |     | 143         | 1099 |      |              | 1954  | 201 |      |  |      |  |
| Signal Information                              |       |                                        |     |               |  |                          |      |                 |     |         |     |             |      |      |              |       |     |      |  |      |  |
| Cycle, s                                        | 170.0 | Reference Phase                        | 2   |               |  |                          |      |                 |     |         |     |             |      |      |              |       |     |      |  |      |  |
| Offset, s                                       | 0     | Reference Point                        | End |               |  |                          |      |                 |     |         |     |             |      |      |              |       |     |      |  |      |  |
| Uncoordinated                                   | No    | Simult. Gap E/W                        | On  | Green         |  | 11.8                     | 92.5 | 45.5            | 0.0 | 0.0     | 0.0 |             |      |      |              |       |     |      |  |      |  |
| Force Mode                                      | Fixed | Simult. Gap N/S                        | On  | Yellow        |  | 3.6                      | 5.0  | 3.6             | 0.0 | 0.0     | 0.0 |             |      |      |              |       |     |      |  |      |  |
|                                                 |       |                                        |     | Red           |  | 3.0                      | 2.0  | 3.0             | 0.0 | 0.0     | 0.0 |             |      |      |              |       |     |      |  |      |  |
| Timer Results                                   |       |                                        |     |               |  | EBL                      |      | EBT             |     | WBL     |     | WBT         |      | NBL  |              | NBT   |     | SBL  |  | SBT  |  |
| Assigned Phase                                  |       |                                        |     |               |  |                          |      | 4               |     |         |     |             |      | 5    |              | 2     |     |      |  | 6    |  |
| Case Number                                     |       |                                        |     |               |  |                          |      | 12.0            |     |         |     |             |      | 1.0  |              | 4.0   |     |      |  | 7.3  |  |
| Phase Duration, s                               |       |                                        |     |               |  |                          |      | 52.1            |     |         |     |             |      | 18.4 |              | 117.9 |     |      |  | 99.5 |  |
| Change Period, ( Y+R c ), s                     |       |                                        |     |               |  |                          |      | 6.6             |     |         |     |             |      | 6.6  |              | 7.0   |     |      |  | 7.0  |  |
| Max Allow Headway ( MAH ), s                    |       |                                        |     |               |  |                          |      | 3.3             |     |         |     |             |      | 3.0  |              | 0.0   |     |      |  | 0.0  |  |
| Queue Clearance Time ( g s ), s                 |       |                                        |     |               |  |                          |      | 44.5            |     |         |     |             |      | 11.6 |              |       |     |      |  |      |  |
| Green Extension Time ( g e ), s                 |       |                                        |     |               |  |                          |      | 0.9             |     |         |     |             |      | 0.2  |              | 0.0   |     |      |  | 0.0  |  |
| Phase Call Probability                          |       |                                        |     |               |  |                          |      | 1.00            |     |         |     |             |      | 1.00 |              |       |     |      |  |      |  |
| Max Out Probability                             |       |                                        |     |               |  |                          |      | 0.00            |     |         |     |             |      | 0.00 |              |       |     |      |  |      |  |
| Movement Group Results                          |       |                                        |     |               |  | EB                       |      |                 | WB  |         |     | NB          |      |      | SB           |       |     |      |  |      |  |
| Approach Movement                               |       |                                        |     |               |  | L                        | T    | R               | L   | T       | R   | L           | T    | R    | L            | T     | R   |      |  |      |  |
| Assigned Movement                               |       |                                        |     |               |  | 7                        | 4    | 14              |     |         |     | 5           | 2    |      |              | 6     | 16  |      |  |      |  |
| Adjusted Flow Rate ( v ), veh/h                 |       |                                        |     |               |  | 412                      |      |                 |     |         |     | 146 1121    |      |      | 1994 205     |       |     |      |  |      |  |
| Adjusted Saturation Flow Rate ( s ), veh/h/ln   |       |                                        |     |               |  | 1620                     |      |                 |     |         |     | 1795 1781   |      |      | 1795 1572    |       |     |      |  |      |  |
| Queue Service Time ( g s ), s                   |       |                                        |     |               |  | 42.5                     |      |                 |     |         |     | 9.6 27.1    |      |      | 92.5 11.6    |       |     |      |  |      |  |
| Cycle Queue Clearance Time ( g c ), s           |       |                                        |     |               |  | 42.5                     |      |                 |     |         |     | 9.6 27.1    |      |      | 92.5 11.6    |       |     |      |  |      |  |
| Green Ratio ( g/C )                             |       |                                        |     |               |  | 0.27                     |      |                 |     |         |     | 0.63 0.65   |      |      | 0.54 0.54    |       |     |      |  |      |  |
| Capacity ( c ), veh/h                           |       |                                        |     |               |  | 433                      |      |                 |     |         |     | 167 2324    |      |      | 1953 856     |       |     |      |  |      |  |
| Volume-to-Capacity Ratio ( X )                  |       |                                        |     |               |  | 0.952                    |      |                 |     |         |     | 0.872 0.483 |      |      | 1.021 0.240  |       |     |      |  |      |  |
| Back of Queue ( Q ), ft/ln ( 95 th percentile)  |       |                                        |     |               |  | 645.9                    |      |                 |     |         |     | 267.5 404.1 |      |      | 1438.6 198.7 |       |     |      |  |      |  |
| Back of Queue ( Q ), veh/ln ( 95 th percentile) |       |                                        |     |               |  | 25.0                     |      |                 |     |         |     | 10.6 15.9   |      |      | 57.1 7.8     |       |     |      |  |      |  |
| Queue Storage Ratio ( RQ ) ( 95 th percentile)  |       |                                        |     |               |  | 0.00                     |      |                 |     |         |     | 0.89 0.00   |      |      | 0.00 0.00    |       |     |      |  |      |  |
| Uniform Delay ( d 1 ), s/veh                    |       |                                        |     |               |  | 61.2                     |      |                 |     |         |     | 58.2 15.0   |      |      | 38.8 20.3    |       |     |      |  |      |  |
| Incremental Delay ( d 2 ), s/veh                |       |                                        |     |               |  | 5.4                      |      |                 |     |         |     | 5.4 0.7     |      |      | 25.8 0.7     |       |     |      |  |      |  |
| Initial Queue Delay ( d 3 ), s/veh              |       |                                        |     |               |  | 0.0                      |      |                 |     |         |     | 0.0 0.0     |      |      | 0.0 0.0      |       |     |      |  |      |  |
| Control Delay ( d ), s/veh                      |       |                                        |     |               |  | 66.6                     |      |                 |     |         |     | 63.5 15.7   |      |      | 64.6 21.0    |       |     |      |  |      |  |
| Level of Service (LOS)                          |       |                                        |     |               |  | E                        |      |                 |     |         |     | E B         |      |      | F C          |       |     |      |  |      |  |
| Approach Delay, s/veh / LOS                     |       |                                        |     |               |  | 66.6                     |      | E               |     | 0.0     |     | 21.2        |      | C    |              | 60.5  |     | E    |  |      |  |
| Intersection Delay, s/veh / LOS                 |       |                                        |     |               |  | 48.3                     |      |                 |     |         |     | D           |      |      |              |       |     |      |  |      |  |
| Multimodal Results                              |       |                                        |     |               |  | EB                       |      |                 | WB  |         |     | NB          |      |      | SB           |       |     |      |  |      |  |
| Pedestrian LOS Score / LOS                      |       |                                        |     |               |  | 2.34                     |      | B               |     | 2.34    |     | B           |      | 1.37 |              | A     |     | 1.69 |  | B    |  |
| Bicycle LOS Score / LOS                         |       |                                        |     |               |  | 1.17                     |      | A               |     |         |     | 1.53        |      | B    |              | 2.30  |     | B    |  |      |  |



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### HCS7 Signalized Intersection Results Summary

| General Information                             |                                        |                 |                           | Intersection Information |         |       |      |  |       |       |       |   |      |       |       |
|-------------------------------------------------|----------------------------------------|-----------------|---------------------------|--------------------------|---------|-------|------|-------------------------------------------------------------------------------------|-------|-------|-------|---|------|-------|-------|
| Agency                                          | Diane B. Zimmerman Traffic Engineering |                 |                           | Duration, h              | 0.250   |       |      |                                                                                     |       |       |       |   |      |       |       |
| Analyst                                         | DBZ                                    | Analysis Date   | 9/19/2021                 | Area Type                | Other   |       |      |                                                                                     |       |       |       |   |      |       |       |
| Jurisdiction                                    |                                        | Time Period     | AM Peak                   | PHF                      | 0.94    |       |      |                                                                                     |       |       |       |   |      |       |       |
| Urban Street                                    | Bardstown Road                         | Analysis Year   | 2027 Build                | Analysis Period          | 1> 7:00 |       |      |                                                                                     |       |       |       |   |      |       |       |
| Intersection                                    | Thixton                                | File Name       | Thixton AM 27 B Right.xus |                          |         |       |      |                                                                                     |       |       |       |   |      |       |       |
| Project Description                             | Oak Grove Right turn Thixton           |                 |                           |                          |         |       |      |                                                                                     |       |       |       |   |      |       |       |
| Demand Information                              |                                        |                 |                           | EB                       |         |       | WB   |                                                                                     |       | NB    |       |   | SB   |       |       |
| Approach Movement                               |                                        |                 |                           | L                        | T       | R     | L    | T                                                                                   | R     | L     | T     | R | L    | T     | R     |
| Demand ( v ), veh/h                             |                                        |                 |                           | 156                      |         | 85    |      |                                                                                     |       | 279   | 1685  |   |      | 805   | 68    |
| Signal Information                              |                                        |                 |                           |                          |         |       |      |                                                                                     |       |       |       |   |      |       |       |
| Cycle, s                                        | 120.0                                  | Reference Phase | 2                         |                          |         |       |      |                                                                                     |       |       |       |   |      |       |       |
| Offset, s                                       | 0                                      | Reference Point | End                       |                          |         |       |      |                                                                                     |       |       |       |   |      |       |       |
| Uncoordinated                                   | No                                     | Simult. Gap E/W | On                        | Green                    | 8.7     | 77.9  | 13.2 | 0.0                                                                                 | 0.0   | 0.0   |       |   |      |       |       |
|                                                 |                                        |                 |                           | Yellow                   | 3.6     | 5.0   | 3.6  | 0.0                                                                                 | 0.0   | 0.0   |       |   |      |       |       |
| Force Mode                                      | Fixed                                  | Simult. Gap N/S | On                        | Red                      | 3.0     | 2.0   | 3.0  | 0.0                                                                                 | 0.0   | 0.0   |       |   |      |       |       |
| Timer Results                                   |                                        |                 |                           | EBL                      | EBT     | WBL   | WBT  | NBL                                                                                 | NBT   | SBL   | SBT   |   |      |       |       |
| Assigned Phase                                  |                                        |                 |                           |                          | 4       |       |      | 5                                                                                   | 2     |       | 6     |   |      |       |       |
| Case Number                                     |                                        |                 |                           |                          | 9.0     |       |      | 1.0                                                                                 | 4.0   |       | 7.3   |   |      |       |       |
| Phase Duration, s                               |                                        |                 |                           |                          | 19.8    |       |      | 15.3                                                                                | 100.2 |       | 84.9  |   |      |       |       |
| Change Period, ( Y+R c ), s                     |                                        |                 |                           |                          | 6.6     |       |      | 6.6                                                                                 | 7.0   |       | 7.0   |   |      |       |       |
| Max Allow Headway ( MAH ), s                    |                                        |                 |                           |                          | 3.2     |       |      | 3.0                                                                                 | 0.0   |       | 0.0   |   |      |       |       |
| Queue Clearance Time ( g s ), s                 |                                        |                 |                           |                          | 12.8    |       |      | 8.3                                                                                 |       |       |       |   |      |       |       |
| Green Extension Time ( g e ), s                 |                                        |                 |                           |                          | 0.4     |       |      | 0.4                                                                                 | 0.0   |       | 0.0   |   |      |       |       |
| Phase Call Probability                          |                                        |                 |                           |                          | 1.00    |       |      | 1.00                                                                                |       |       |       |   |      |       |       |
| Max Out Probability                             |                                        |                 |                           |                          | 0.00    |       |      | 0.00                                                                                |       |       |       |   |      |       |       |
| Movement Group Results                          |                                        |                 |                           | EB                       |         |       | WB   |                                                                                     |       | NB    |       |   | SB   |       |       |
| Approach Movement                               |                                        |                 |                           | L                        | T       | R     | L    | T                                                                                   | R     | L     | T     | R | L    | T     | R     |
| Assigned Movement                               |                                        |                 |                           | 7                        |         | 14    |      |                                                                                     |       | 5     | 2     |   |      | 6     | 16    |
| Adjusted Flow Rate ( v ), veh/h                 |                                        |                 |                           | 166                      |         | 90    |      |                                                                                     |       | 297   | 1793  |   |      | 856   | 72    |
| Adjusted Saturation Flow Rate ( s ), veh/h/ln   |                                        |                 |                           | 1810                     |         | 1610  |      |                                                                                     |       | 1781  | 1766  |   |      | 1724  | 1547  |
| Queue Service Time ( g s ), s                   |                                        |                 |                           | 10.8                     |         | 5.8   |      |                                                                                     |       | 6.3   | 27.6  |   |      | 13.9  | 2.1   |
| Cycle Queue Clearance Time ( g c ), s           |                                        |                 |                           | 10.8                     |         | 5.8   |      |                                                                                     |       | 6.3   | 27.6  |   |      | 13.9  | 2.1   |
| Green Ratio ( g/C )                             |                                        |                 |                           | 0.11                     |         | 0.18  |      |                                                                                     |       | 0.74  | 0.78  |   |      | 0.65  | 0.65  |
| Capacity ( c ), veh/h                           |                                        |                 |                           | 198                      |         | 293   |      |                                                                                     |       | 533   | 2745  |   |      | 2239  | 1005  |
| Volume-to-Capacity Ratio ( X )                  |                                        |                 |                           | 0.837                    |         | 0.308 |      |                                                                                     |       | 0.557 | 0.653 |   |      | 0.382 | 0.072 |
| Back of Queue ( Q ), ft/ln ( 95 th percentile)  |                                        |                 |                           | 218.4                    |         | 104.8 |      |                                                                                     |       | 81.8  | 294.1 |   |      | 214.5 | 29.8  |
| Back of Queue ( Q ), veh/ln ( 95 th percentile) |                                        |                 |                           | 8.7                      |         | 4.2   |      |                                                                                     |       | 3.2   | 11.5  |   |      | 8.2   | 1.1   |
| Queue Storage Ratio ( RQ ) ( 95 th percentile)  |                                        |                 |                           | 0.00                     |         | 0.00  |      |                                                                                     |       | 0.27  | 0.00  |   |      | 0.00  | 0.00  |
| Uniform Delay ( d 1 ), s/veh                    |                                        |                 |                           | 52.4                     |         | 42.5  |      |                                                                                     |       | 6.9   | 6.1   |   |      | 9.8   | 7.7   |
| Incremental Delay ( d 2 ), s/veh                |                                        |                 |                           | 3.6                      |         | 0.2   |      |                                                                                     |       | 0.3   | 1.2   |   |      | 0.5   | 0.1   |
| Initial Queue Delay ( d 3 ), s/veh              |                                        |                 |                           | 0.0                      |         | 0.0   |      |                                                                                     |       | 0.0   | 0.0   |   |      | 0.0   | 0.0   |
| Control Delay ( d ), s/veh                      |                                        |                 |                           | 55.9                     |         | 42.7  |      |                                                                                     |       | 7.2   | 7.3   |   |      | 10.3  | 7.9   |
| Level of Service ( LOS )                        |                                        |                 |                           | E                        |         | D     |      |                                                                                     |       | A     | A     |   |      | B     | A     |
| Approach Delay, s/veh / LOS                     |                                        |                 |                           | 51.3                     |         | D     |      | 0.0                                                                                 |       | 7.3   | A     |   | 10.1 |       | B     |
| Intersection Delay, s/veh / LOS                 |                                        |                 |                           | 11.5                     |         |       |      |                                                                                     |       | B     |       |   |      |       |       |
| Multimodal Results                              |                                        |                 |                           | EB                       |         |       | WB   |                                                                                     |       | NB    |       |   | SB   |       |       |
| Pedestrian LOS Score / LOS                      |                                        |                 |                           | 2.33                     |         | B     | 2.32 |                                                                                     | B     | 0.64  | A     |   | 1.88 |       | B     |
| Bicycle LOS Score / LOS                         |                                        |                 |                           |                          |         | F     |      |                                                                                     |       | 2.21  | B     |   | 1.25 |       | A     |



| HCS7 Signalized Intersection Results Summary    |                                        |                 |               |                           |      |                 |                          |       |       |       |       |      |       |      |       |  |
|-------------------------------------------------|----------------------------------------|-----------------|---------------|---------------------------|------|-----------------|--------------------------|-------|-------|-------|-------|------|-------|------|-------|--|
| General Information                             |                                        |                 |               |                           |      |                 | Intersection Information |       |       |       |       |      |       |      |       |  |
| Agency                                          | Diane B. Zimmerman Traffic Engineering |                 |               |                           |      |                 | Duration, h              | 0.250 |       |       |       |      |       |      |       |  |
| Analyst                                         | DBZ                                    |                 | Analysis Date | 9/19/2021                 |      | Area Type       | Other                    |       |       |       |       |      |       |      |       |  |
| Jurisdiction                                    |                                        |                 | Time Period   | PM Peak                   |      | PHF             | 0.98                     |       |       |       |       |      |       |      |       |  |
| Urban Street                                    | Bardstown Road                         |                 | Analysis Year | 2027 Build                |      | Analysis Period | 1> 4:45                  |       |       |       |       |      |       |      |       |  |
| Intersection                                    | Thixton                                |                 | File Name     | Thixton PM 27 B Right.xus |      |                 |                          |       |       |       |       |      |       |      |       |  |
| Project Description                             | Oak Grove Right                        |                 |               |                           |      |                 |                          |       |       |       |       |      |       |      |       |  |
| Demand Information                              |                                        |                 |               | EB                        |      |                 | WB                       |       |       | NB    |       |      | SB    |      |       |  |
| Approach Movement                               |                                        |                 |               | L                         | T    | R               | L                        | T     | R     | L     | T     | R    | L     | T    | R     |  |
| Demand ( v ), veh/h                             |                                        |                 |               | 135                       |      | 269             |                          |       |       | 143   | 1099  |      |       | 1954 | 201   |  |
| Signal Information                              |                                        |                 |               |                           |      |                 |                          |       |       |       |       |      |       |      |       |  |
| Cycle, s                                        | 170.0                                  | Reference Phase | 2             |                           |      |                 |                          |       |       |       |       |      |       |      |       |  |
| Offset, s                                       | 0                                      | Reference Point | End           |                           |      |                 |                          |       |       |       |       |      |       |      |       |  |
| Uncoordinated                                   | No                                     | Simult. Gap E/W | On            | Green                     | 6.9  | 112.7           | 30.2                     | 0.0   | 0.0   | 0.0   |       |      |       |      |       |  |
| Force Mode                                      | Fixed                                  | Simult. Gap N/S | On            | Yellow                    | 3.6  | 5.0             | 3.6                      | 0.0   | 0.0   | 0.0   |       |      |       |      |       |  |
|                                                 |                                        |                 |               | Red                       | 3.0  | 2.0             | 3.0                      | 0.0   | 0.0   | 0.0   |       |      |       |      |       |  |
| Timer Results                                   |                                        |                 |               | EBL                       | EBT  | WBL             | WBT                      | NBL   | NBT   | SBL   | SBT   |      |       |      |       |  |
| Assigned Phase                                  |                                        |                 |               |                           | 4    |                 |                          | 5     | 2     |       | 6     |      |       |      |       |  |
| Case Number                                     |                                        |                 |               |                           | 9.0  |                 |                          | 1.0   | 4.0   |       | 7.3   |      |       |      |       |  |
| Phase Duration, s                               |                                        |                 |               |                           | 36.8 |                 |                          | 13.5  | 133.2 |       | 119.7 |      |       |      |       |  |
| Change Period, ( Y+R c ), s                     |                                        |                 |               |                           | 6.6  |                 |                          | 6.6   | 7.0   |       | 7.0   |      |       |      |       |  |
| Max Allow Headway ( MAH ), s                    |                                        |                 |               |                           | 3.3  |                 |                          | 3.0   | 0.0   |       | 0.0   |      |       |      |       |  |
| Queue Clearance Time ( g s ), s                 |                                        |                 |               |                           | 29.3 |                 |                          | 6.7   |       |       |       |      |       |      |       |  |
| Green Extension Time ( g e ), s                 |                                        |                 |               |                           | 0.9  |                 |                          | 0.2   | 0.0   |       | 0.0   |      |       |      |       |  |
| Phase Call Probability                          |                                        |                 |               |                           | 1.00 |                 |                          | 1.00  |       |       |       |      |       |      |       |  |
| Max Out Probability                             |                                        |                 |               |                           | 0.00 |                 |                          | 0.00  |       |       |       |      |       |      |       |  |
| Movement Group Results                          |                                        |                 |               | EB                        |      |                 | WB                       |       |       | NB    |       |      | SB    |      |       |  |
| Approach Movement                               |                                        |                 |               | L                         | T    | R               | L                        | T     | R     | L     | T     | R    | L     | T    | R     |  |
| Assigned Movement                               |                                        |                 |               | 7                         |      | 14              |                          |       |       | 5     | 2     |      | 6     |      | 16    |  |
| Adjusted Flow Rate ( v ), veh/h                 |                                        |                 |               | 138                       |      | 274             |                          |       |       | 146   | 1121  |      | 1994  |      | 205   |  |
| Adjusted Saturation Flow Rate ( s ), veh/h/in   |                                        |                 |               | 1810                      |      | 1610            |                          |       |       | 1795  | 1781  |      | 1795  |      | 1572  |  |
| Queue Service Time ( g s ), s                   |                                        |                 |               | 11.5                      |      | 27.3            |                          |       |       | 4.7   | 20.1  |      | 71.6  |      | 8.6   |  |
| Cycle Queue Clearance Time ( g c ), s           |                                        |                 |               | 11.5                      |      | 27.3            |                          |       |       | 4.7   | 20.1  |      | 71.6  |      | 8.6   |  |
| Green Ratio ( g/C )                             |                                        |                 |               | 0.18                      |      | 0.22            |                          |       |       | 0.72  | 0.74  |      | 0.66  |      | 0.66  |  |
| Capacity ( c ), veh/h                           |                                        |                 |               | 321                       |      | 352             |                          |       |       | 168   | 2644  |      | 2379  |      | 1042  |  |
| Volume-to-Capacity Ratio ( X )                  |                                        |                 |               | 0.429                     |      | 0.781           |                          |       |       | 0.867 | 0.424 |      | 0.838 |      | 0.197 |  |
| Back of Queue ( Q ), ft/in ( 95 th percentile)  |                                        |                 |               | 228.9                     |      | 421.1           |                          |       |       | 195.4 | 289.2 |      | 938.3 |      | 137.7 |  |
| Back of Queue ( Q ), veh/in ( 95 th percentile) |                                        |                 |               | 9.2                       |      | 16.8            |                          |       |       | 7.8   | 11.4  |      | 37.2  |      | 5.4   |  |
| Queue Storage Ratio ( RQ ) ( 95 th percentile)  |                                        |                 |               | 0.00                      |      | 0.00            |                          |       |       | 0.65  | 0.00  |      | 0.00  |      | 0.00  |  |
| Uniform Delay ( d 1 ), s/veh                    |                                        |                 |               | 62.3                      |      | 62.6            |                          |       |       | 40.2  | 8.2   |      | 21.7  |      | 11.1  |  |
| Incremental Delay ( d 2 ), s/veh                |                                        |                 |               | 0.3                       |      | 1.4             |                          |       |       | 5.2   | 0.5   |      | 3.7   |      | 0.4   |  |
| Initial Queue Delay ( d 3 ), s/veh              |                                        |                 |               | 0.0                       |      | 0.0             |                          |       |       | 0.0   | 0.0   |      | 0.0   |      | 0.0   |  |
| Control Delay ( d ), s/veh                      |                                        |                 |               | 62.6                      |      | 64.0            |                          |       |       | 45.3  | 8.7   |      | 25.5  |      | 11.5  |  |
| Level of Service (LOS)                          |                                        |                 |               | E                         |      | E               |                          |       |       | D     | A     |      | C     |      | B     |  |
| Approach Delay, s/veh / LOS                     |                                        |                 |               | 63.6                      |      | E               | 0.0                      |       |       | 12.9  | B     | 24.2 |       | C    |       |  |
| Intersection Delay, s/veh / LOS                 |                                        |                 |               | 24.7                      |      |                 |                          |       | C     |       |       |      |       |      |       |  |
| Multimodal Results                              |                                        |                 |               | EB                        |      |                 | WB                       |       |       | NB    |       |      | SB    |      |       |  |
| Pedestrian LOS Score / LOS                      |                                        |                 |               | 2.34                      |      | B               | 2.34                     |       | B     | 0.67  | A     | 1.89 |       | B    |       |  |
| Bicycle LOS Score / LOS                         |                                        |                 |               |                           |      | F               |                          |       |       | 1.53  | B     | 2.30 |       | B    |       |  |



Entrance PM Peak Hour Southbound Approach

## Left Turn Lane Warrants

### Input Fields

|                        |    |                                          |      |
|------------------------|----|------------------------------------------|------|
| Left Turn Volume (vph) | 25 | Speed Limit (mph)                        | 35   |
| Advancing Volume (vph) | 57 | No. of through lanes                     | 1    |
| Opposing Volume (vph)  | 79 | Percent Heavy Vehicles (decimal percent) | 0.01 |



Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.



Entrance AM Peak Hour Northbound Approach

### Right Turn Lane Warrants

Input Fields

Right Turn Volume (vph)

29

Speed Limit (mph)

35

Advancing Volume (vph)

119



Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.



## Docket No. 21-ZONE-0059

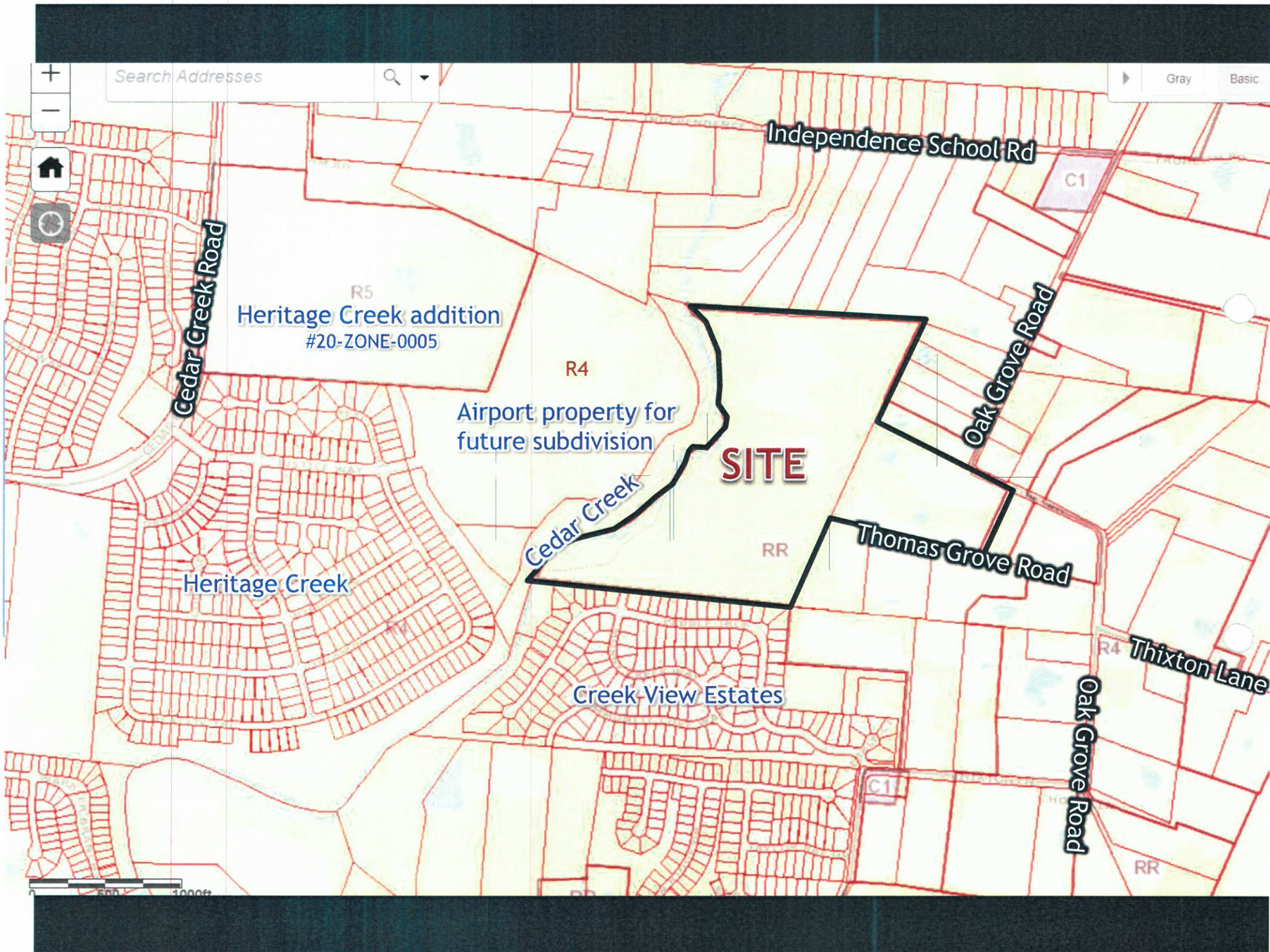


Zone Change from RR to R-4 and a LDC 4.7.7  
density transfer subdivision to allow a 263-lot  
single family subdivision on property located  
at 10212 and 10302 Oak Grove Road

Attorneys: Bardenwerper Talbott & Roberts, PLLC

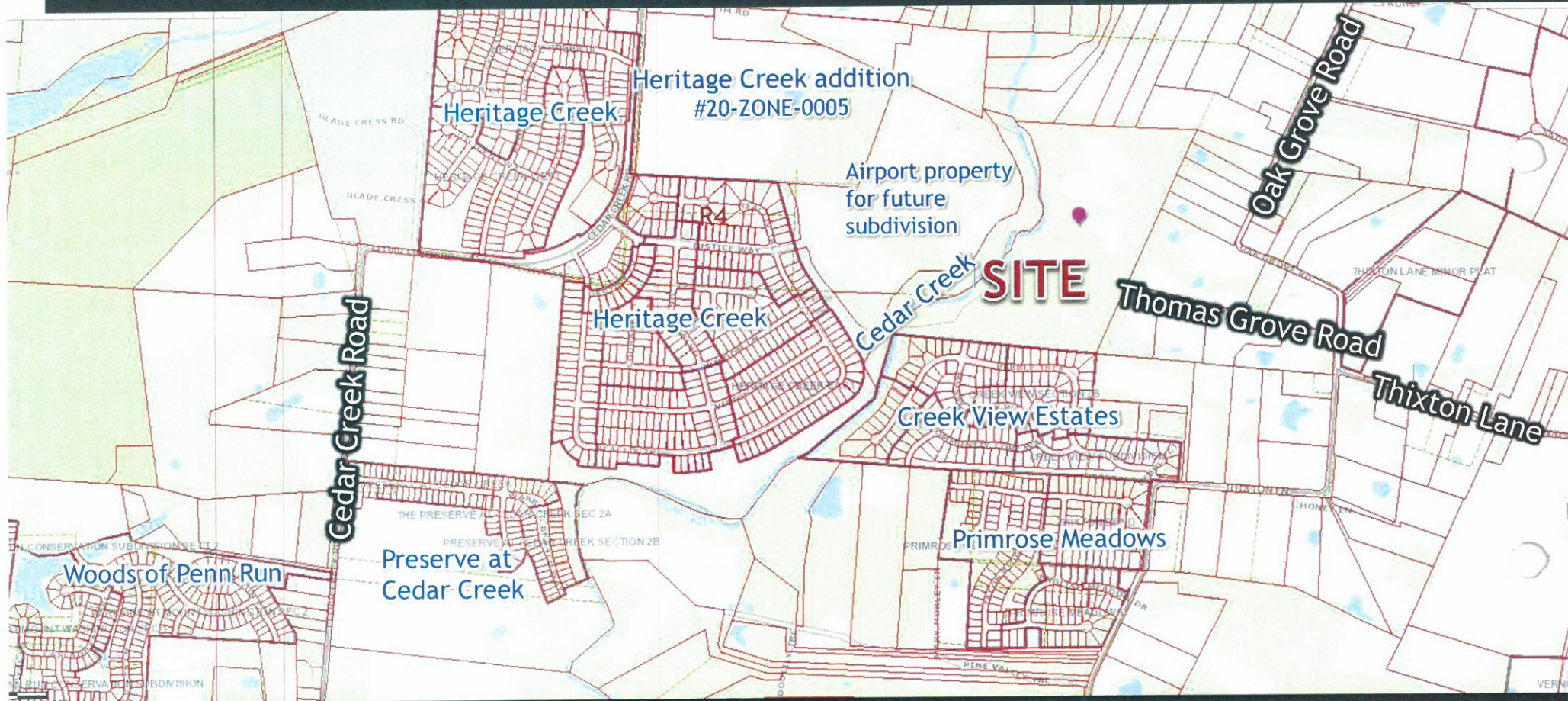
Land Planners, Landscape Architects & Engineers: Mindel Scott & Associates, Inc.







Independence School Rd





Heritage Creek addition  
#20-ZONE-0005

Airport property  
for future  
subdivision

Heritage Creek

Creek View Estates

Mossy Creek Way

Oak Grove Road

Thomas Grove Road

Thixton Lane





Ordinance for area-wide  
rezoning in area on 72 parcels,  
Case #9868

ORDINANCE No. 40, SERIES 2008

AN ORDINANCE CHANGING THE ZONING FROM R-4 SINGLE-FAMILY RESIDENTIAL TO R-R RURAL RESIDENTIAL ON 732 PARCELS OF PROPERTY, AND 1011 THIXTON LANE (TAX BLOCK 0087 LOT 0243 SUB LOT 0000) SHALL REMAIN R-4 SINGLE-FAMILY RESIDENTIAL, AS IDENTIFIED FURTHER IN THE ATTACHED LEGAL DESCRIPTIONS, LOCATED IN THE THIXTON LANE AREA, CONTAINING 466.03 461.10 ACRES AND BEING IN LOUISVILLE METRO (CASE NO. 9868) (AS AMENDED)

SPONSORED BY: COUNCILMAN TOM OWEN

WHEREAS, the Legislative Council of the Louisville/Jefferson County Metro Government (the "Council") has considered the evidence presented at the public hearing held by the Louisville Metro Planning Commission and the recommendations of the Commission and its staff as set out in the minutes and records of the Planning Commission in Case No. 9868; and

WHEREAS, the Council concurs in and adopts the findings of the Planning Commission for the zoning changes in Case No. 9868 and approves and accepts the recommendations of the Planning Commission as set out in said minutes and records;

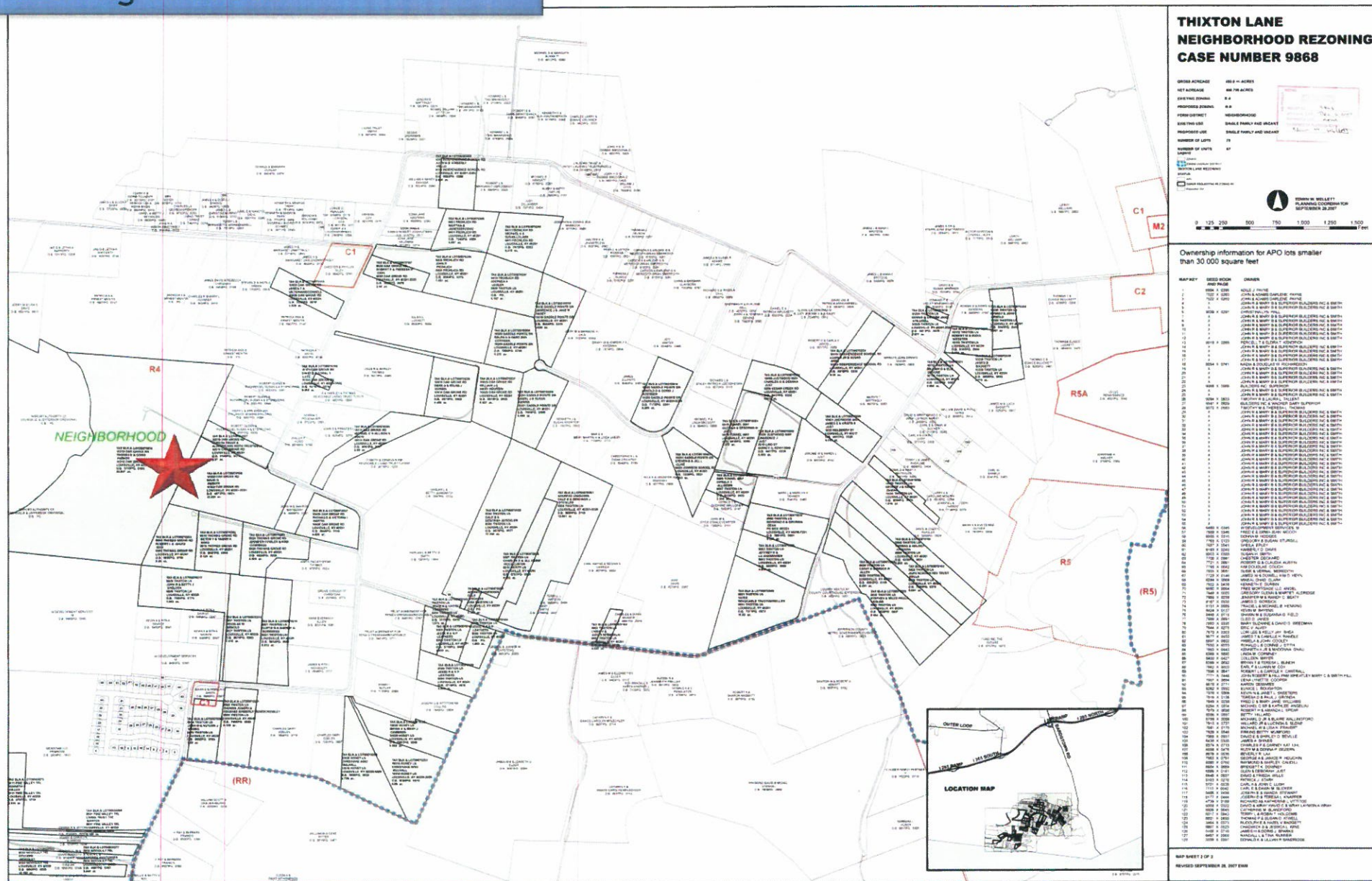
**NOW THEREFORE BE IT ORDAINED BY THE LEGISLATIVE COUNCIL OF THE LOUISVILLE/JEFFERSON COUNTY METRO GOVERNMENT AS FOLLOWS:**

**Section I:** That the properties located in the Thixton Lane Rezoning Area, as that term is defined in the minutes and records of the Planning Commission in Case No. 9868, containing 466.03 461.10 acres and being in Louisville Metro, more particularly described in said minutes and records, are hereby rezoned from R-4 Single Family

000467



Properties within the area-wide rezoning in #9868







View of site from Oak Grove Road, looking south toward 90° bend, where proposed subdivision entrance will be located.





View Oak Grove Road looking west toward 90° bend. Site is to the left.





View Oak Grove Road at Thomas Grove Road





View site from Mossy Creek Way



Previously proposed subdivision  
plan on site from Pulte Homes as  
developer (#15ZONE1069)

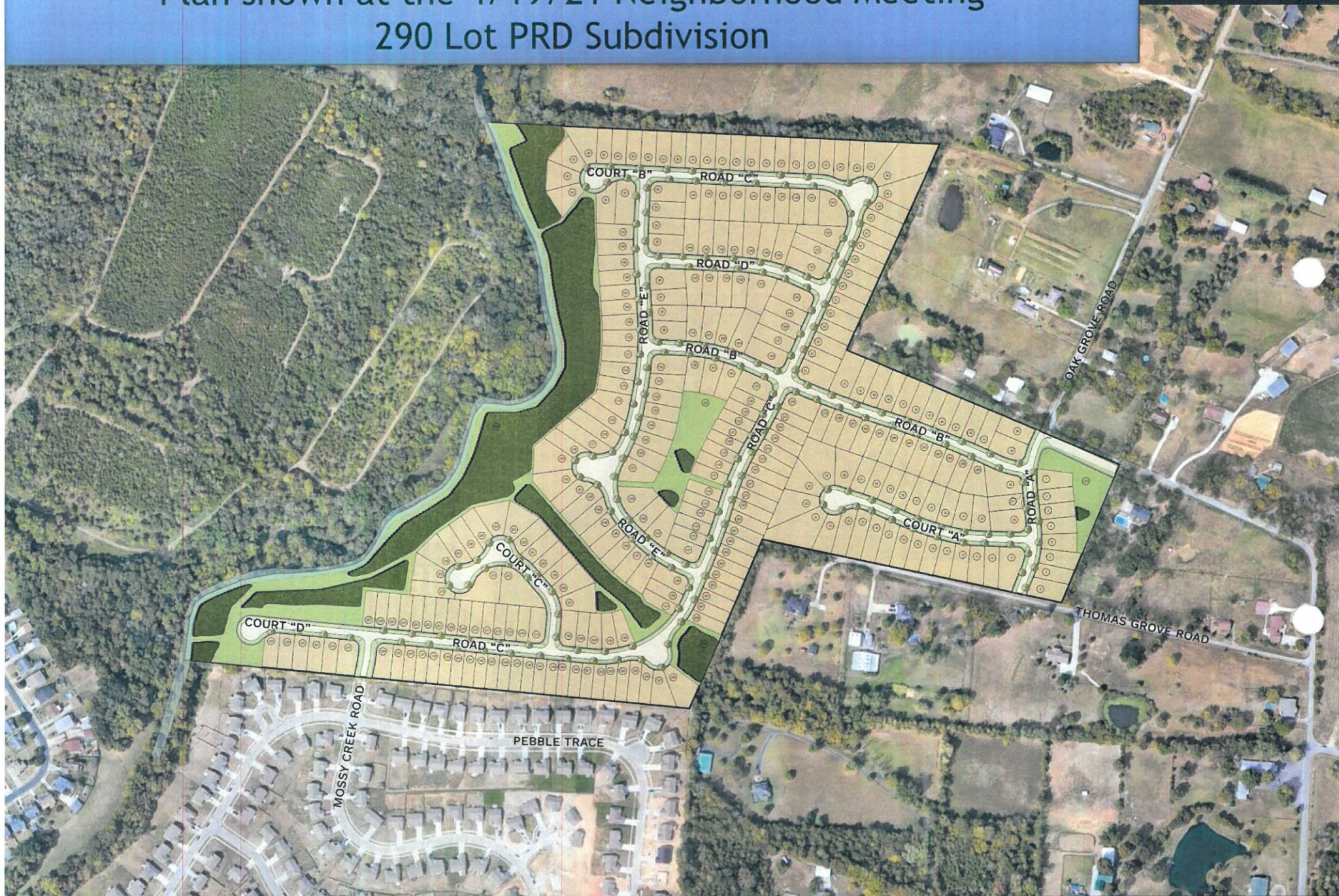
Not part of  
current proposal

SITE



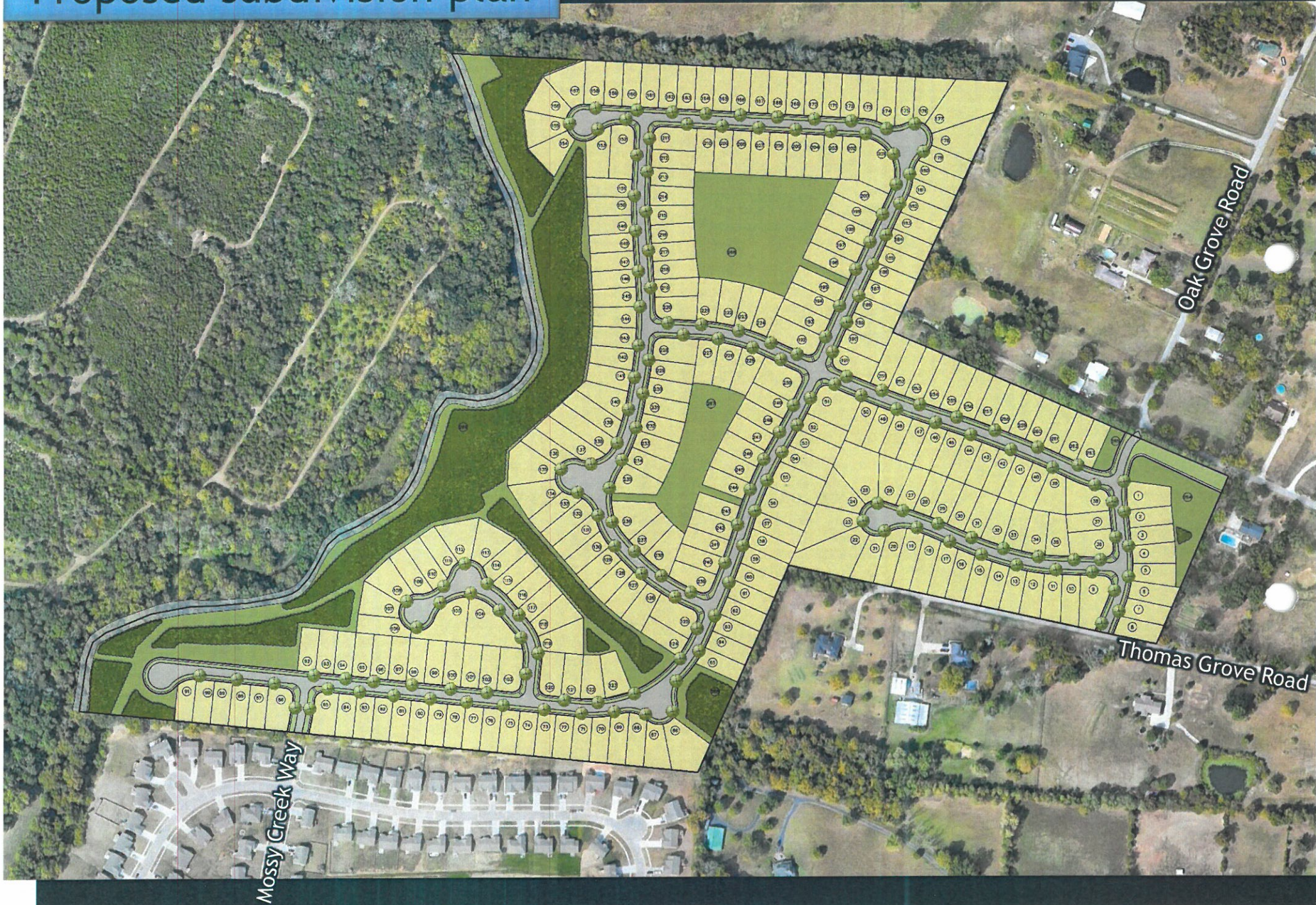


Plan shown at the 4/19/21 Neighborhood Meeting  
290 Lot PRD Subdivision





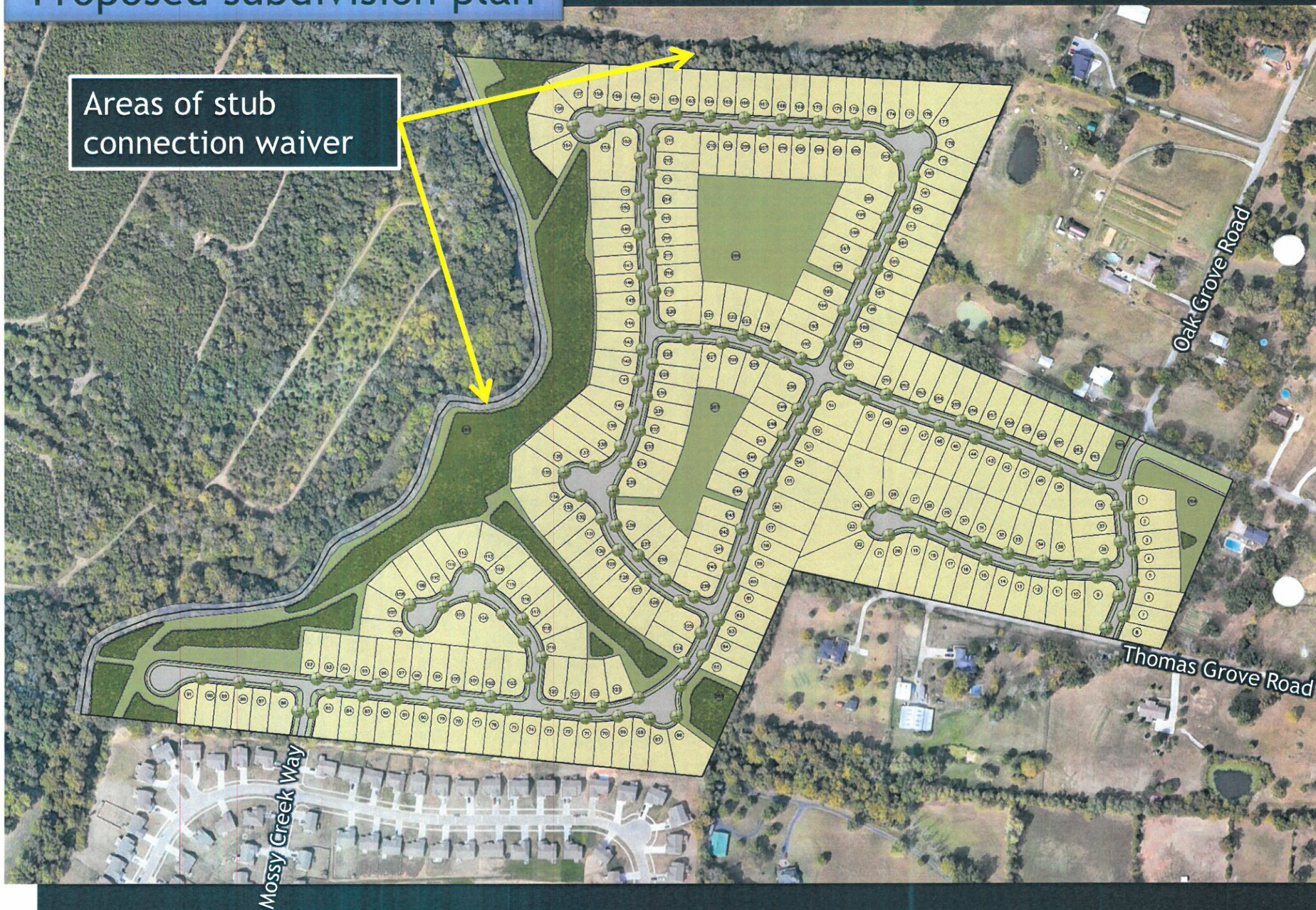
# Proposed subdivision plan





# Proposed subdivision plan

Areas of stub  
connection waiver





# Proposed subdivision plan

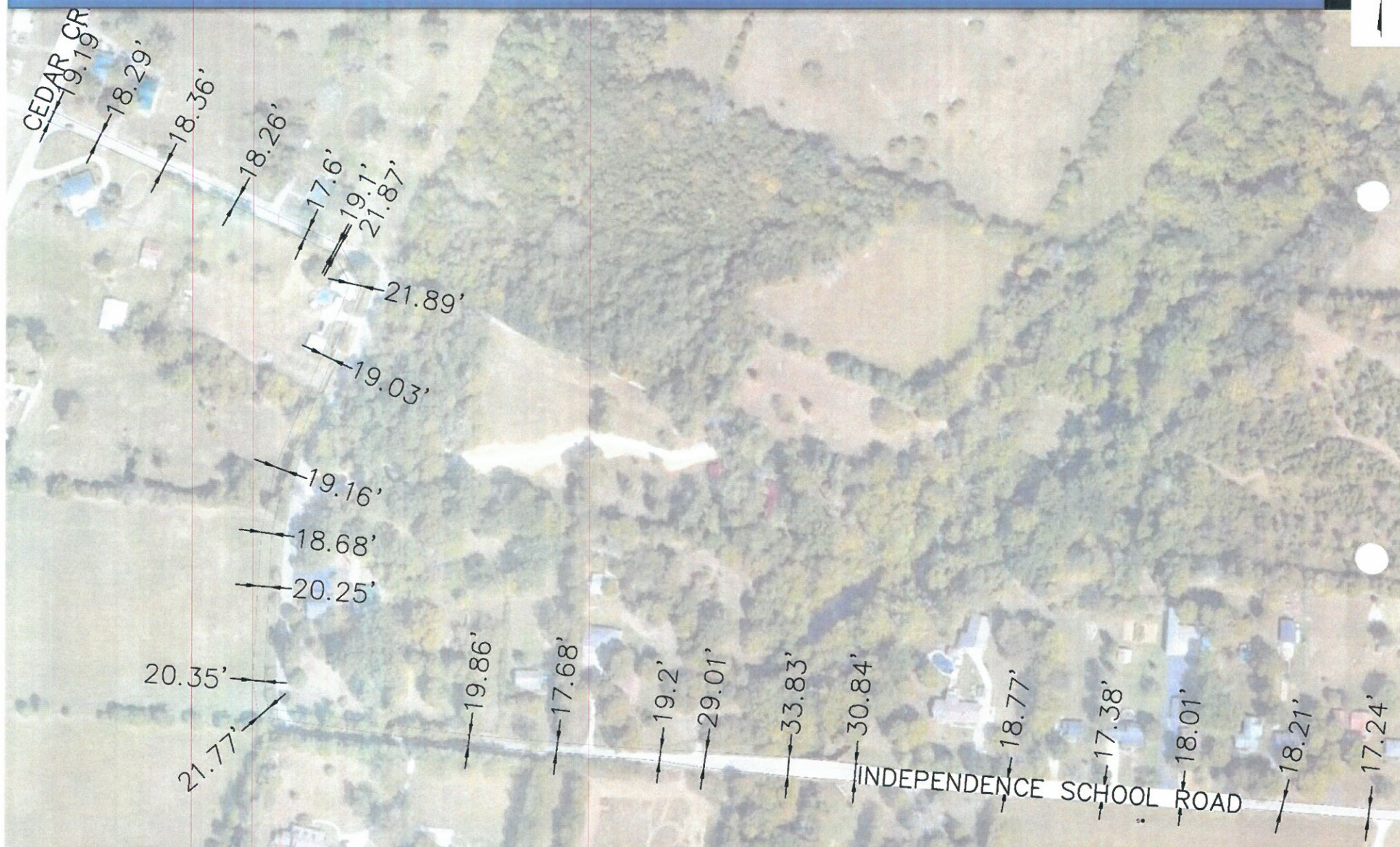


Stub road provided, but no  
physical connection made

Thomas Grove Road



# Survey of Existing Roadway Width - Developer to improve to minimum 18 ft width





# Survey of Existing Roadway Width - Developer to improve to minimum 18 ft width





# Survey of Existing Roadway Width - Developer to improve to minimum 18 ft width





# Survey of Existing Roadway Width - Developer to improve to minimum 18 ft width





final report

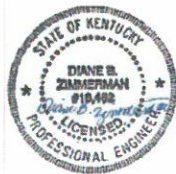
September 16, 2021

## Traffic Impact Study

Oak Grove Subdivision  
10212 Oak Grove Road  
Louisville, KY

Prepared for

Louisville Metro Planning Commission



DIANE B. ZIMMERMAN  
Traffic Engineering, LLC

12803 High Meadows Pike  
Prospect, KY 40059  
502.648.1858  
dianebsmillatt.net





**Table 2. Peak Hour Level of Service**

| Approach                                       | A.M.              |                   |                   | P.M.              |                   |                   |
|------------------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|                                                | 2021 Existing     | 2027 No Build     | 2027 Build        | 2021 Existing     | 2027 No Build     | 2027 Build        |
| <b>Cedar Creek Road at Independence School</b> |                   |                   |                   |                   |                   |                   |
| Independence School Road Eastbound             | A<br>8.8          | A<br>8.9          | A<br>8.9          | A<br>9.1          | A<br>9.2          | A<br>9.3          |
| Independence School Road Westbound             | B<br>10.1         | B<br>10.4         | B<br>10.9         | B<br>10.9         | B<br>11.3         | B<br>11.9         |
| Cedar Creek Road Northbound                    | A<br>7.3          | A<br>7.3          | A<br>7.3          | A<br>7.3          | A<br>7.3          | A<br>7.3          |
| Cedar Creek Road Southbound                    | A<br>7.7          | A<br>7.7          | A<br>7.6          | A<br>7.9          | A<br>8.0          | A<br>8.1          |
| <b>Oak Grove Road at Thixton Lane</b>          |                   |                   |                   |                   |                   |                   |
| Thixton Lane Westbound                         | A<br>9.5          | A<br>9.6          | B<br>11.3         | B<br>10.0         | B<br>10.2         | B<br>12.6         |
| Oak Grove Road Southbound                      | A<br>8.1          | A<br>8.2          | A<br>8.5          | A<br>7.8          | A<br>7.8          | A<br>7.8          |
| <b>Oak Grove Road at Entrance</b>              |                   |                   |                   |                   |                   |                   |
| Oak Grove Road Westbound                       |                   |                   | A<br>9.2          |                   |                   | A<br>9.9          |
| Oak Grove Road Southbound                      |                   |                   | A<br>7.5          |                   |                   | A<br>7.4          |
| <b>Thixton Lane at Pebble Trace</b>            |                   |                   |                   |                   |                   |                   |
| Thixton Lane Eastbound                         | A<br>7.4          | A<br>7.5          | A<br>7.6          | A<br>7.6          | A<br>7.7          | A<br>7.8          |
| Pebble Trace Southbound                        | A<br>9.7          | A<br>9.8          | B<br>10.4         | B<br>10.4         | B<br>10.6         | B<br>11.6         |
| <b>Bardstown Road at Thixton Lane</b>          | <b>B<br/>14.9</b> | <b>B<br/>16.0</b> | <b>B<br/>16.7</b> | <b>C<br/>29.3</b> | <b>C<br/>32.4</b> | <b>D<br/>48.3</b> |
| Thixton Lane Eastbound                         | D<br>43.3         | D<br>44.4         | E<br>72.2         | E<br>64.8         | E<br>69.1         | E<br>66.6         |
| Bardstown Road Northbound                      | B<br>12.3         | B<br>13.4         | B<br>11.0         | B<br>13.7         | B<br>16.2         | B<br>21.2         |

| Approach                  | A.M.          |               |            | P.M.          |               |            |
|---------------------------|---------------|---------------|------------|---------------|---------------|------------|
|                           | 2021 Existing | 2027 No Build | 2027 Build | 2021 Existing | 2027 No Build | 2027 Build |
| Bardstown Road Southbound | B<br>15.4     | B<br>16.3     | B<br>14.3  | C<br>32.6     | D<br>35.4     | E<br>60.5  |

Key: Level of Service, Delay in seconds per vehicle

The entrances were evaluated for turn lanes using the Kentucky Transportation Cabinet [Highway Design Guidance Manual](#) dated July, 2020. Using the volumes in Figure 6, no turn lanes are recommended at the entrance. The recommended traffic control is that westbound Oak Grove Road be controlled with a stop sign. Similar to the intersection of Thixton Lane and Oak Grove Road.

## CONCLUSIONS

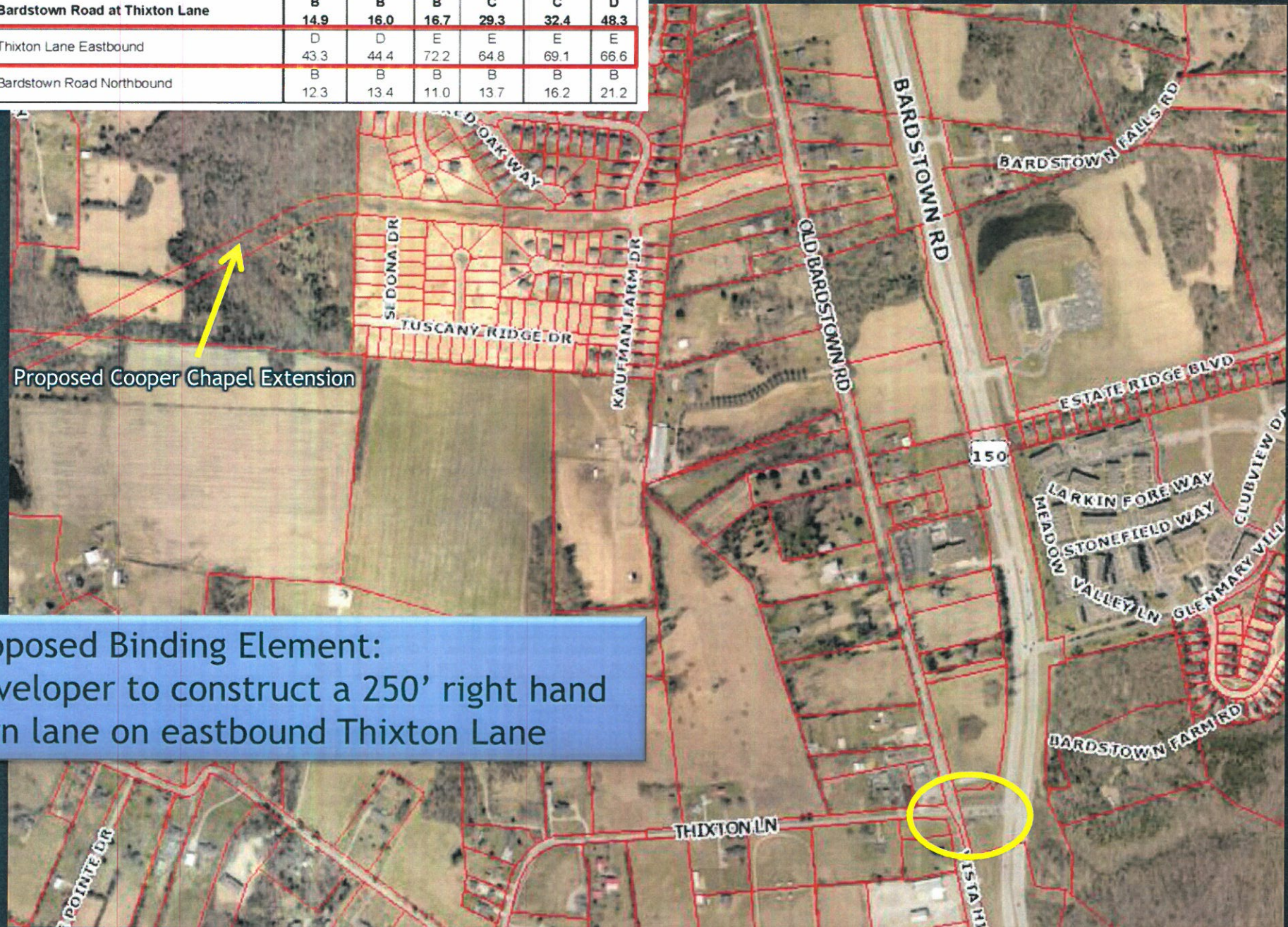
Based upon the volume of traffic generated by the development and the amount of traffic forecasted for the year 2027, there will be a slight impact to the existing highway network. No improvements are required.



|                                       |             |             |             |             |             |             |
|---------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Thixton Lane at Pebble Trace</b>   |             |             |             |             |             |             |
| Thixton Lane Eastbound                | A           | A           | A           | A           | A           | A           |
|                                       | 7.4         | 7.5         | 7.6         | 7.6         | 7.7         | 7.8         |
| Pebble Trace Southbound               | A           | A           | B           | B           | B           | B           |
|                                       | 9.7         | 9.8         | 10.4        | 10.4        | 10.6        | 11.6        |
| <b>Bardstown Road at Thixton Lane</b> |             |             |             |             |             |             |
|                                       | <b>B</b>    | <b>B</b>    | <b>B</b>    | <b>C</b>    | <b>C</b>    | <b>D</b>    |
|                                       | <b>14.9</b> | <b>16.0</b> | <b>16.7</b> | <b>29.3</b> | <b>32.4</b> | <b>48.3</b> |
| Thixton Lane Eastbound                | D           | D           | E           | E           | E           | E           |
|                                       | 43.3        | 44.4        | 72.2        | 64.8        | 69.1        | 66.6        |
| Bardstown Road Northbound             | B           | B           | B           | B           | B           | B           |
|                                       | 12.3        | 13.4        | 11.0        | 13.7        | 16.2        | 21.2        |

Proposed Cooper Chapel Extension

Proposed Binding Element:  
Developer to construct a 250' right hand  
turn lane on eastbound Thixton Lane





# Proposed subdivision plan





# final report

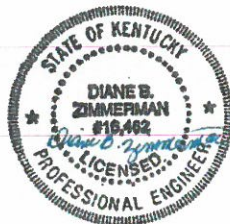
September 16, 2021

## Traffic Impact Study

Oak Grove Subdivision  
10212 Oak Grove Road  
Louisville, KY

Prepared for

Louisville Metro Planning Commission



**DIANE B. ZIMMERMAN**  
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## INTRODUCTION

The site plan for the proposed Oak Grove subdivision shows 263 single-family lots on Oak Grove Road in Louisville, KY. **Figure 1** displays a map of the site. Access to the site will be from Oak Grove Road. The subdivision also connects to Mossy Creek Way. The purpose of this study is to examine the traffic impacts of the development upon the adjacent highway system. For this study, the impact area was defined to be the intersections of Oak Grove Road with Thixton Lane, Thixton Lane with Pebble Trace and Bardstown Road, and Independence School Road with Cedar Creek Road.

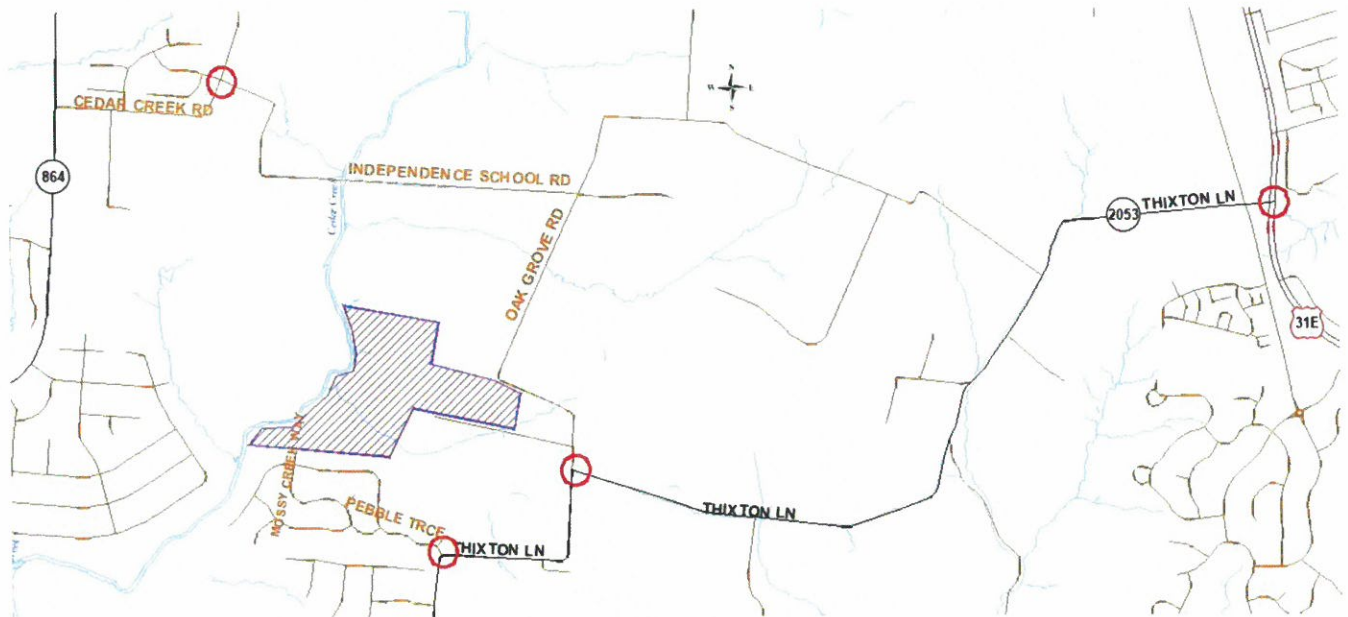


Figure 1. Site Map

## EXISTING CONDITIONS

Oak Grove Road is a Metro-maintained road with an estimated 2021 ADT of 400 vehicles per day north of Thixton Lane, as estimated from the turning movement count. The road is a two-lane highway with nine-foot lanes with one-foot stabilized shoulders. The speed limit is 35 mph. There are no sidewalks. The intersection with Thixton Lane is controlled with a stop sign on the westbound approach of Thixton Lane.

Peak hour traffic counts for the intersections were obtained on Tuesday, August 24, 2021. The a.m. and p.m. peak hour varied between the intersections. **Figure 2** illustrates the existing a.m. and p.m. peak hour traffic volumes. The Appendix contains the full count data.



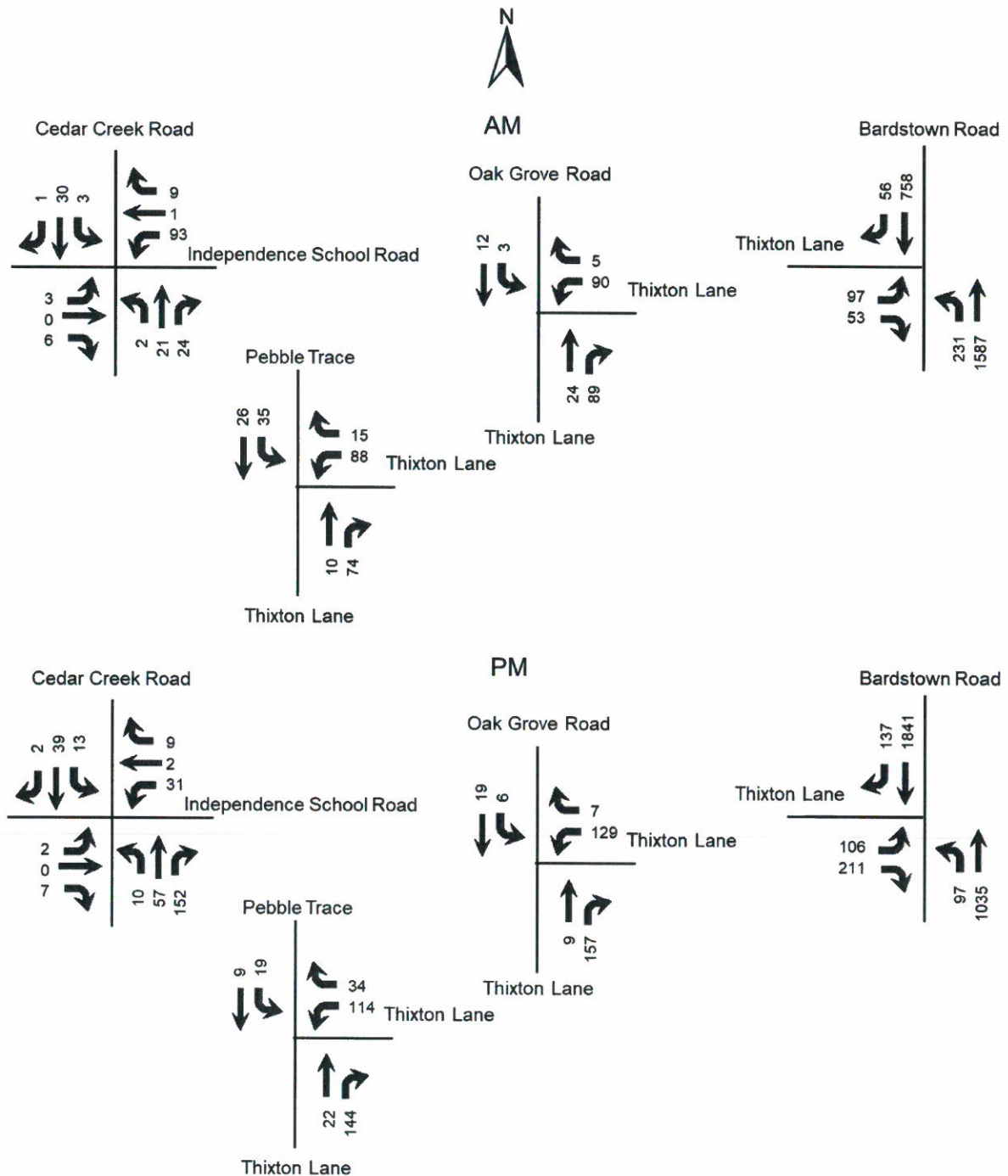


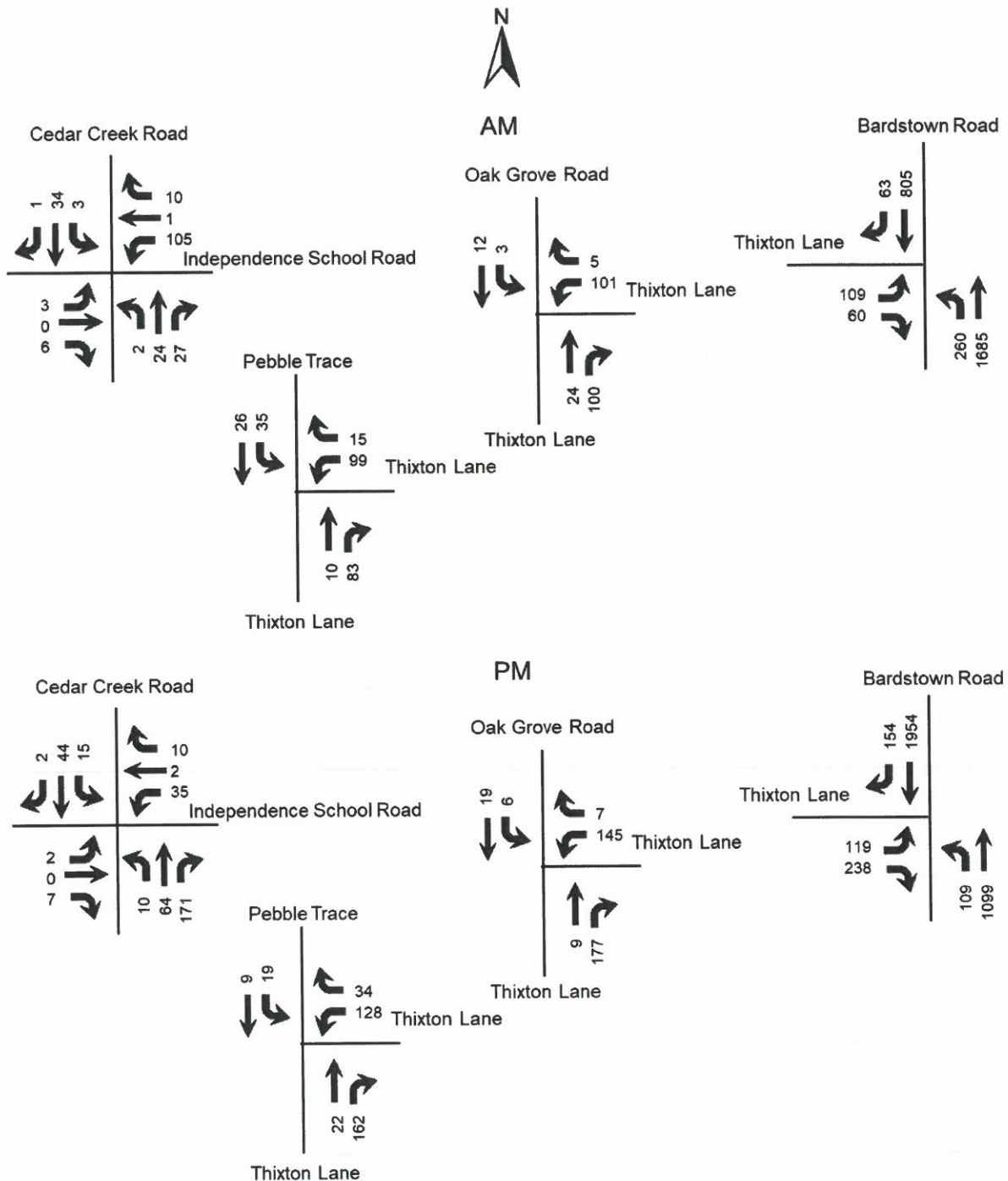
Figure 2. Existing Peak Hour Volumes

## FUTURE CONDITIONS

The project completion date is 2027. An annual growth rate of 2 percent was applied to the 2021 thru volumes on Thixton Lane and Cedar Creek Road. This was determined by the historical growth at KYTC station 274. One percent



annual growth was applied to the thru traffic on Bardstown Road. **Figure 3** displays the 2027 No Build peak hour volumes.



**Figure 3. 2027 No Build Peak Hour Volumes**

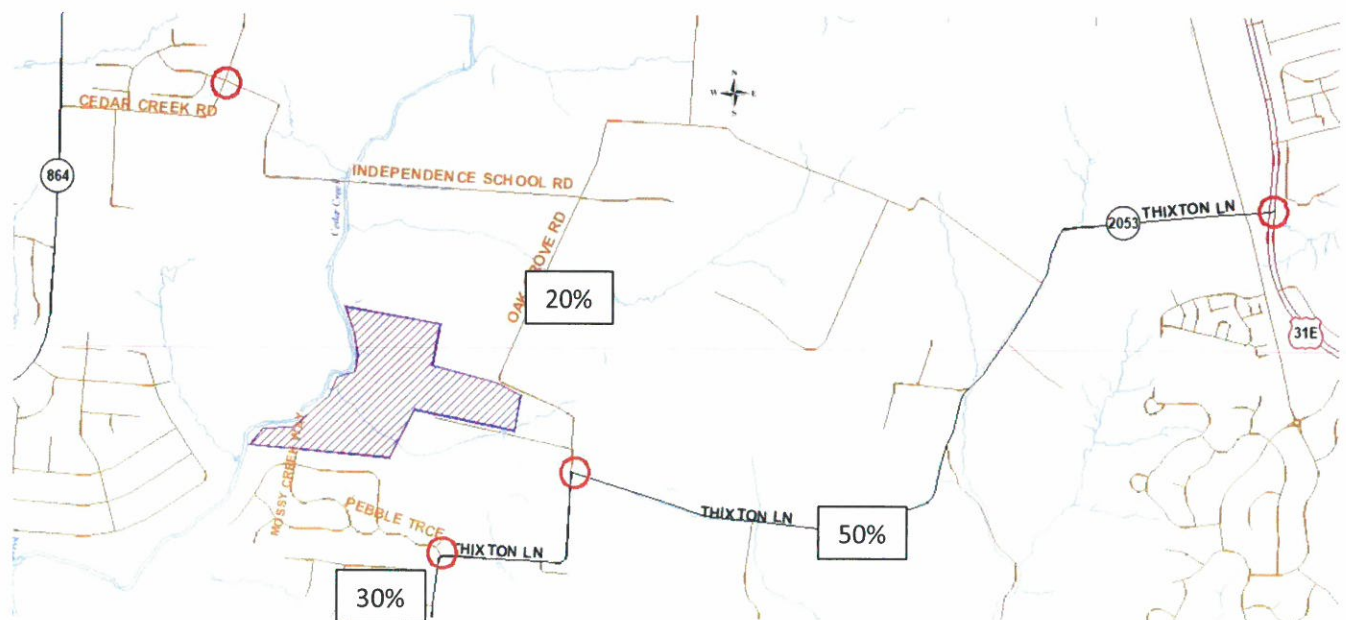


## TRIP GENERATION

The Institute of Transportation Engineers Trip Generation Manual, 10<sup>th</sup> Edition contains trip generation rates for a wide range of developments. The land use of "Single-Family Detached (210)" was reviewed and determined to be the best match. The trip generation results are listed in **Table 1**. The trips were assigned to the highway network with the percentages shown in **Figure 4**. **Figure 5** shows the trips generated by this development and distributed throughout the road network during the peak hours. **Figure 6** displays the individual turning movements for the peak hours when the development is completed.

**Table 1. Peak Hour Trips Generated by Site**

| Land Use                  | A.M. Peak Hour |    |     | P.M. Peak Hour |     |     |
|---------------------------|----------------|----|-----|----------------|-----|-----|
|                           | Trips          | In | Out | Trips          | In  | Out |
| Single-Family (263 units) | 192            | 48 | 144 | 257            | 162 | 95  |



**Figure 4. Trip Distribution Percentages**



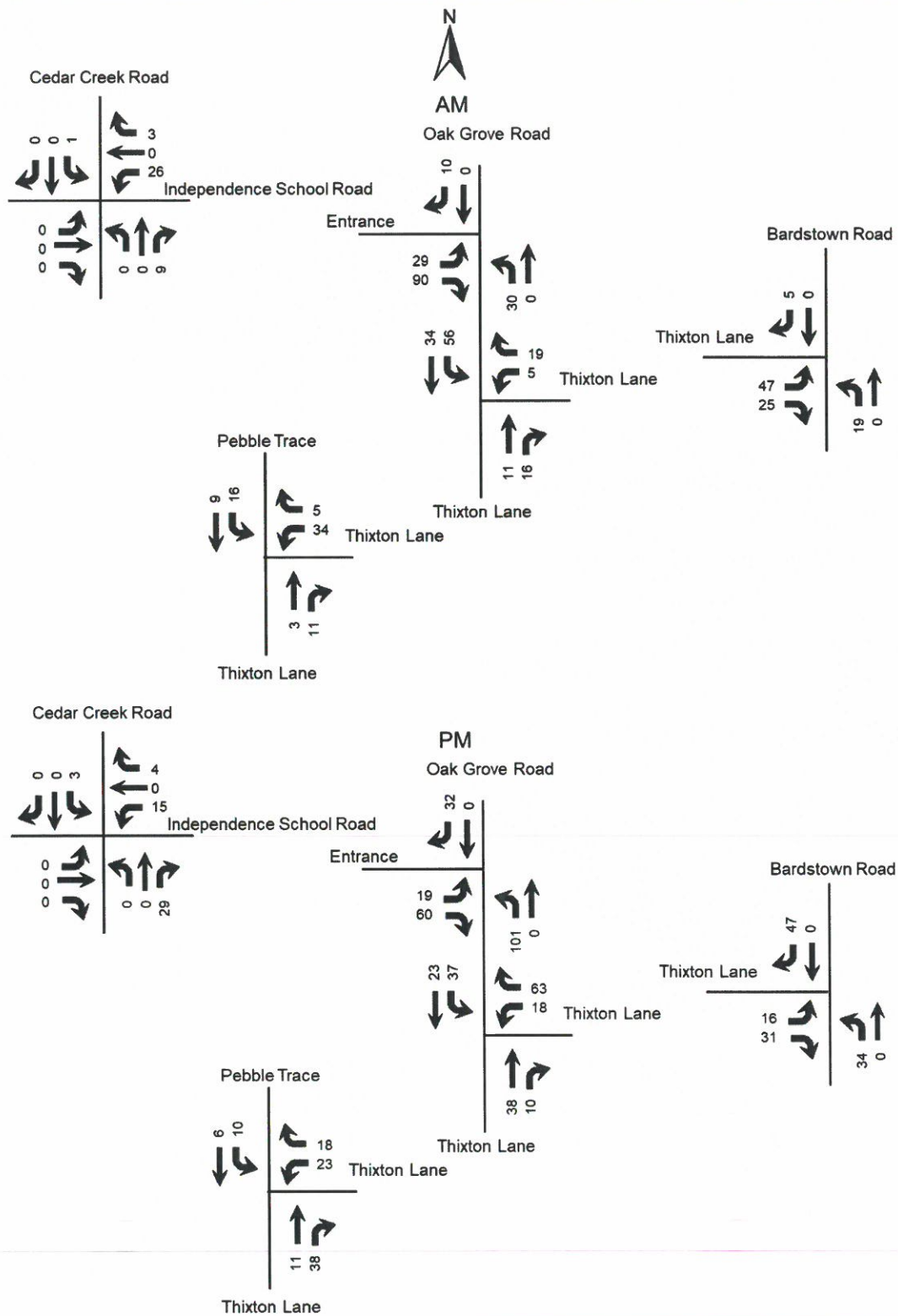


Figure 5. Peak Hour Trips Generated by Site



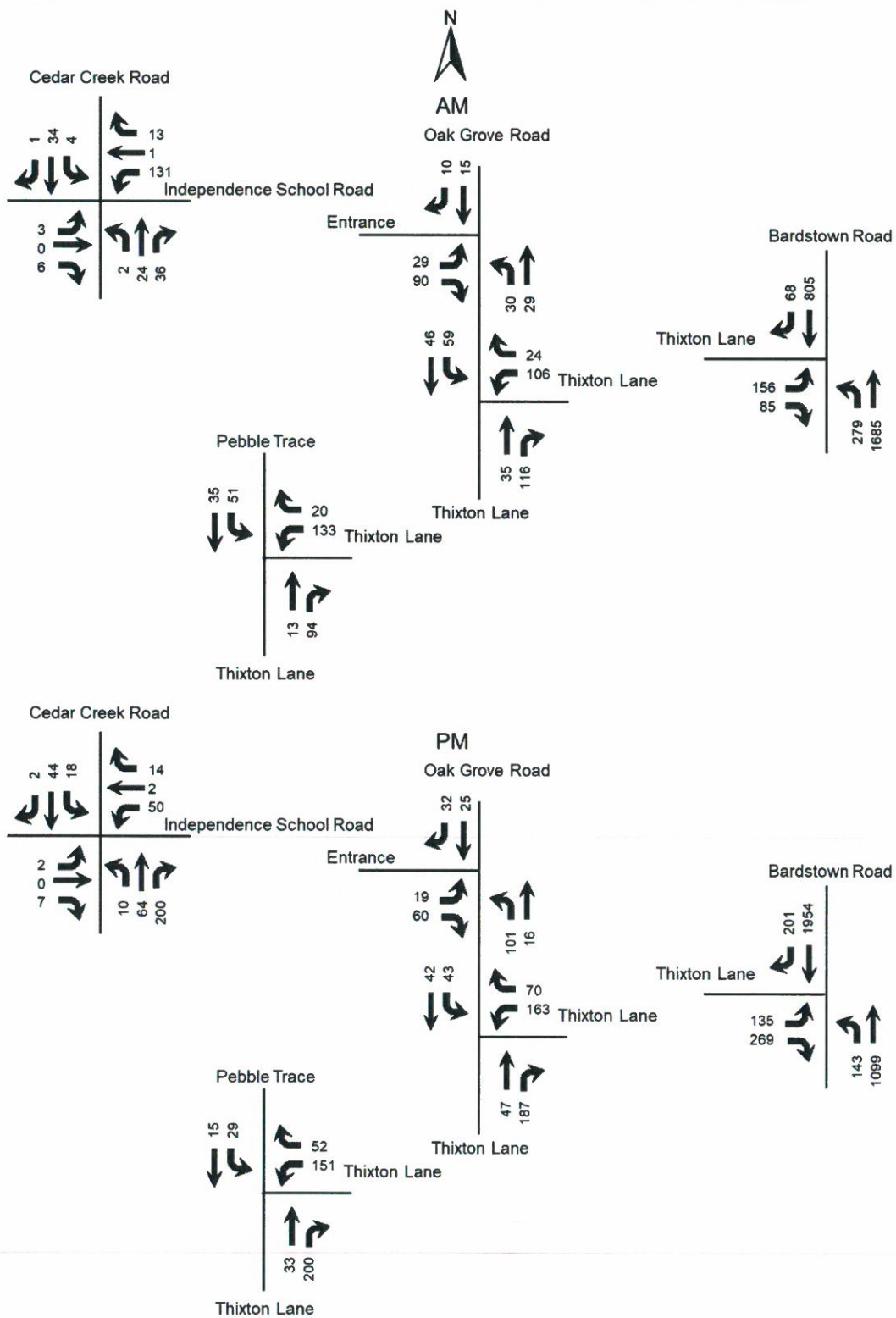


Figure 6. 2027 Build Peak Hour Volumes



## ANALYSIS

The qualitative measure of operation for a roadway facility or intersection is evaluated by assigning a "Level of Service". Level of Service is a ranking scale from A through F, "A" is the best operating condition and "F" is the worst. Level of Service results depend upon the facility that is analyzed. In this case, the Level of Service is based upon the total delay experienced for lanes at stop-controlled intersections.

To evaluate the impact of the proposed development, the vehicle delays at the intersections were determined using procedures detailed in the Highway Capacity Manual, 6<sup>th</sup> edition. Future delays and Level of Service were determined for the intersections using the HCS Streets (version 7.9.5) software. The delays and Level of Service are summarized in **Table 2**.

**Table 2. Peak Hour Level of Service**

| Approach                                       | A.M.              |                   |                   | P.M.              |                   |                   |
|------------------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|                                                | 2021 Existing     | 2027 No Build     | 2027 Build        | 2021 Existing     | 2027 No Build     | 2027 Build        |
| <b>Cedar Creek Road at Independence School</b> |                   |                   |                   |                   |                   |                   |
| Independence School Road Eastbound             | A<br>8.8          | A<br>8.9          | A<br>8.9          | A<br>9.1          | A<br>9.2          | A<br>9.3          |
| Independence School Road Westbound             | B<br>10.1         | B<br>10.4         | B<br>10.9         | B<br>10.9         | B<br>11.3         | B<br>11.9         |
| Cedar Creek Road Northbound                    | A<br>7.3          | A<br>7.3          | A<br>7.3          | A<br>7.3          | A<br>7.3          | A<br>7.3          |
| Cedar Creek Road Southbound                    | A<br>7.7          | A<br>7.7          | A<br>7.6          | A<br>7.9          | A<br>8.0          | A<br>8.1          |
| <b>Oak Grove Road at Thixton Lane</b>          |                   |                   |                   |                   |                   |                   |
| Thixton Lane Westbound                         | A<br>9.5          | A<br>9.6          | B<br>11.3         | B<br>10.0         | B<br>10.2         | B<br>12.6         |
| Oak Grove Road Southbound                      | A<br>8.1          | A<br>8.2          | A<br>8.5          | A<br>7.8          | A<br>7.8          | A<br>7.8          |
| <b>Oak Grove Road at Entrance</b>              |                   |                   |                   |                   |                   |                   |
| Oak Grove Road Westbound                       |                   |                   | A<br>9.2          |                   |                   | A<br>9.9          |
| Oak Grove Road Southbound                      |                   |                   | A<br>7.5          |                   |                   | A<br>7.4          |
| <b>Thixton Lane at Pebble Trace</b>            |                   |                   |                   |                   |                   |                   |
| Thixton Lane Eastbound                         | A<br>7.4          | A<br>7.5          | A<br>7.6          | A<br>7.6          | A<br>7.7          | A<br>7.8          |
| Pebble Trace Southbound                        | A<br>9.7          | A<br>9.8          | B<br>10.4         | B<br>10.4         | B<br>10.6         | B<br>11.6         |
| <b>Bardstown Road at Thixton Lane</b>          | <b>B<br/>14.9</b> | <b>B<br/>16.0</b> | <b>B<br/>16.7</b> | <b>C<br/>29.3</b> | <b>C<br/>32.4</b> | <b>D<br/>48.3</b> |
| Thixton Lane Eastbound                         | D<br>43.3         | D<br>44.4         | E<br>72.2         | E<br>64.8         | E<br>69.1         | E<br>66.6         |
| Bardstown Road Northbound                      | B<br>12.3         | B<br>13.4         | B<br>11.0         | B<br>13.7         | B<br>16.2         | B<br>21.2         |



Oak Grove Subdivision  
Traffic Impact Study

|                           | A.M.             |                  |               | P.M.             |                  |               |
|---------------------------|------------------|------------------|---------------|------------------|------------------|---------------|
| Approach                  | 2021<br>Existing | 2027<br>No Build | 2027<br>Build | 2021<br>Existing | 2027<br>No Build | 2027<br>Build |
| Bardstown Road Southbound | B<br>15.4        | B<br>16.3        | B<br>14.3     | C<br>32.6        | D<br>35.4        | E<br>60.5     |

*Key: Level of Service, Delay in seconds per vehicle*

The entrances were evaluated for turn lanes using the Kentucky Transportation Cabinet [Highway Design Guidance Manual](#) dated July, 2020. Using the volumes in Figure 6, no turn lanes are recommended at the entrance. The recommended traffic control is that westbound Oak Grove Road be controlled with a stop sign. Similar to the intersection of Thixton Lane and Oak Grove Road.

## CONCLUSIONS

Based upon the volume of traffic generated by the development and the amount of traffic forecasted for the year 2027, there will be a slight impact to the existing highway network. No improvements are required.



## **APPENDIX**



Oak Grove Subdivision  
Traffic Impact Study

Traffic Counts

Classified Turn Movement Count || All vehicles



Jefferson County, KY

www.marrtraffic.com

Site 4 of 4

Cedar Creek Rd (South)  
Cedar Creek Rd (North)  
Independence School Rd (West)  
Independence School Rd (East)

Date

Tuesday, August 24, 2021

Weather

Fair  
87°F

Lat/Long

38.104664°, -85.607391°

0700 - 0900 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound             |          |           |            |           | Southbound             |          |           |            |           | Eastbound                     |           |            |             |           | Westbound                     |           |            |             |           | Int Total |
|----------------|------------------------|----------|-----------|------------|-----------|------------------------|----------|-----------|------------|-----------|-------------------------------|-----------|------------|-------------|-----------|-------------------------------|-----------|------------|-------------|-----------|-----------|
|                | Cedar Creek Rd (South) |          |           |            |           | Cedar Creek Rd (North) |          |           |            |           | Independence School Rd (West) |           |            |             |           | Independence School Rd (East) |           |            |             |           |           |
|                | Left 4.1               | Thru 4.2 | Right 4.3 | U-Turn 4.4 | App Total | Left 4.5               | Thru 4.6 | Right 4.7 | U-Turn 4.8 | App Total | Left 4.9                      | Thru 4.10 | Right 4.11 | U-Turn 4.12 | App Total | Left 4.13                     | Thru 4.14 | Right 4.15 | U-Turn 4.16 | App Total |           |
| 0700 - 0715    | 0                      | 5        | 3         | 0          | 8         | 1                      | 6        | 0         | 0          | 7         | 0                             | 1         | 3          | 0           | 4         | 21                            | 0         | 2          | 0           | 23        | 42        |
| 0715 - 0730    | 1                      | 2        | 3         | 0          | 6         | 1                      | 5        | 0         | 0          | 6         | 0                             | 0         | 1          | 0           | 1         | 22                            | 0         | 2          | 0           | 24        | 37        |
| 0730 - 0745    | 2                      | 7        | 3         | 0          | 12        | 0                      | 11       | 0         | 0          | 11        | 0                             | 0         | 3          | 0           | 3         | 46                            | 0         | 2          | 0           | 48        | 74        |
| 0745 - 0800    | 0                      | 3        | 7         | 0          | 10        | 0                      | 1        | 0         | 0          | 1         | 0                             | 0         | 0          | 0           | 0         | 16                            | 1         | 3          | 0           | 20        | 31        |
| Hourly Total   | 3                      | 17       | 16        | 0          | 36        | 2                      | 23       | 0         | 0          | 25        | 0                             | 1         | 7          | 0           | 8         | 105                           | 1         | 9          | 0           | 115       | 184       |
| 0800 - 0815    | 0                      | 5        | 6         | 0          | 11        | 3                      | 6        | 1         | 0          | 10        | 2                             | 0         | 2          | 0           | 4         | 19                            | 0         | 2          | 0           | 21        | 46        |
| 0815 - 0830    | 0                      | 6        | 8         | 0          | 14        | 0                      | 12       | 0         | 0          | 12        | 1                             | 0         | 1          | 0           | 2         | 12                            | 0         | 2          | 0           | 14        | 42        |
| 0830 - 0845    | 0                      | 7        | 5         | 0          | 12        | 0                      | 7        | 0         | 0          | 7         | 0                             | 0         | 0          | 0           | 0         | 7                             | 0         | 3          | 0           | 10        | 29        |
| 0845 - 0900    | 0                      | 2        | 9         | 0          | 11        | 1                      | 13       | 0         | 0          | 14        | 0                             | 0         | 2          | 0           | 2         | 9                             | 0         | 3          | 0           | 12        | 39        |
| Hourly Total   | 0                      | 20       | 28        | 0          | 48        | 4                      | 38       | 1         | 0          | 43        | 3                             | 0         | 5          | 0           | 8         | 47                            | 0         | 10         | 0           | 57        | 156       |
| Grand Total    | 3                      | 37       | 44        | 0          | 84        | 6                      | 61       | 1         | 0          | 68        | 3                             | 1         | 12         | 0           | 16        | 152                           | 1         | 19         | 0           | 172       | 340       |
| Approach %     | 3.57                   | 44.05    | 52.38     | 0.00       | -         | 8.82                   | 89.71    | 1.47      | 0.00       | -         | 18.75                         | 6.25      | 75.00      | 0.00        | -         | 88.37                         | 0.58      | 11.05      | 0.00        | -         |           |
| Intersection % | 0.88                   | 10.88    | 12.94     | 0.00       | 24.71     | 1.76                   | 17.94    | 0.29      | 0.00       | 20.00     | 0.88                          | 0.29      | 3.53       | 0.00        | 4.71      | 44.71                         | 0.29      | 5.59       | 0.00        | 50.59     |           |
| PHF            | 0.25                   | 0.75     | 0.75      | 0.00       | 0.84      | 0.25                   | 0.63     | 0.25      | 0.00       | 0.71      | 0.38                          | 0.00      | 0.50       | 0.00        | 0.56      | 0.51                          | 0.25      | 0.75       | 0.00        | 0.54      | 0.65      |

1600 - 1800 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound             |       |       |        |       | Southbound             |       |       |        |       | Eastbound                     |      |       |        |      | Westbound                     |      |       |        |       | Int  |
|----------------|------------------------|-------|-------|--------|-------|------------------------|-------|-------|--------|-------|-------------------------------|------|-------|--------|------|-------------------------------|------|-------|--------|-------|------|
|                | Cedar Creek Rd (South) |       |       |        |       | Cedar Creek Rd (North) |       |       |        |       | Independence School Rd (West) |      |       |        |      | Independence School Rd (East) |      |       |        |       |      |
|                | Left                   | Thru  | Right | U-Turn | App   | Left                   | Thru  | Right | U-Turn | App   | Left                          | Thru | Right | U-Turn | App  | Left                          | Thru | Right | U-Turn | App   |      |
| 1600 - 1615    | 3                      | 6     | 26    | 0      | 35    | 3                      | 10    | 2     | 0      | 15    | 0                             | 0    | 1     | 0      | 1    | 15                            | 0    | 2     | 0      | 17    | 68   |
| 1615 - 1630    | 3                      | 11    | 25    | 0      | 39    | 3                      | 7     | 0     | 0      | 10    | 0                             | 0    | 0     | 0      | 0    | 6                             | 1    | 3     | 0      | 10    | 59   |
| 1630 - 1645    | 1                      | 17    | 50    | 0      | 68    | 3                      | 19    | 2     | 0      | 24    | 1                             | 0    | 1     | 0      | 2    | 12                            | 0    | 4     | 0      | 16    | 110  |
| 1645 - 1700    | 1                      | 6     | 35    | 0      | 42    | 2                      | 6     | 0     | 0      | 8     | 1                             | 0    | 1     | 0      | 2    | 10                            | 1    | 4     | 0      | 15    | 67   |
| Hourly Total   | 8                      | 40    | 136   | 0      | 184   | 11                     | 42    | 4     | 0      | 57    | 2                             | 0    | 3     | 0      | 5    | 43                            | 2    | 13    | 0      | 58    | 304  |
| 1700 - 1715    | 5                      | 20    | 37    | 0      | 62    | 4                      | 8     | 0     | 0      | 12    | 0                             | 0    | 5     | 0      | 5    | 6                             | 1    | 1     | 0      | 8     | 87   |
| 1715 - 1730    | 3                      | 14    | 30    | 0      | 47    | 4                      | 6     | 0     | 0      | 10    | 0                             | 0    | 0     | 0      | 0    | 3                             | 0    | 0     | 0      | 3     | 60   |
| 1730 - 1745    | 2                      | 8     | 22    | 0      | 32    | 2                      | 7     | 2     | 0      | 11    | 1                             | 0    | 4     | 0      | 5    | 7                             | 0    | 4     | 0      | 11    | 59   |
| 1745 - 1800    | 4                      | 4     | 17    | 0      | 25    | 1                      | 7     | 1     | 0      | 9     | 3                             | 0    | 2     | 0      | 5    | 5                             | 0    | 2     | 0      | 7     | 46   |
| Hourly Total   | 14                     | 46    | 106   | 0      | 166   | 11                     | 28    | 3     | 0      | 42    | 4                             | 0    | 11    | 0      | 15   | 21                            | 1    | 7     | 0      | 29    | 252  |
| Grand Total    | 22                     | 86    | 242   | 0      | 350   | 22                     | 70    | 7     | 0      | 99    | 6                             | 0    | 14    | 0      | 20   | 64                            | 3    | 20    | 0      | 87    | 556  |
| Approach %     | 6.29                   | 24.57 | 69.14 | 0.00   | -     | 22.22                  | 70.71 | 7.07  | 0.00   | -     | 30.00                         | 0.00 | 70.00 | 0.00   | -    | 73.56                         | 3.45 | 22.99 | 0.00   | -     |      |
| Intersection % | 3.96                   | 15.47 | 43.53 | 0.00   | 62.95 | 3.96                   | 12.59 | 1.26  | 0.00   | 17.81 | 1.08                          | 0.00 | 2.52  | 0.00   | 3.60 | 11.51                         | 0.54 | 3.60  | 0.00   | 15.65 |      |
| PHF            | 0.50                   | 0.71  | 0.76  | 0.00   | 0.81  | 0.81                   | 0.51  | 0.25  | 0.00   | 0.56  | 0.50                          | 0.00 | 0.35  | 0.00   | 0.45 | 0.65                          | 0.50 | 0.56  | 0.00   | 0.66  | 0.74 |



# Oak Grove Subdivision Traffic Impact Study

## Classified Turn Movement Count || All vehicles

Jefferson County, KY



**Marr Traffic**  
DATA COLLECTION

www.marrtraffic.com

### Site 2 of 4

KY-2053 Thixton Ln (South)  
Oak Grove Rd

### Date

Tuesday, August 24, 2021

### Weather

Fair  
87°F

### Lat/Long

38.09235°, -85.593529°

### 0700 - 0900 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound<br>KY-2053 Thixton Ln (South) |              |               |              | Southbound<br>Oak Grove Rd |             |               |              |
|----------------|------------------------------------------|--------------|---------------|--------------|----------------------------|-------------|---------------|--------------|
|                | Thru<br>2.1                              | Right<br>2.2 | U-Turn<br>2.3 | App<br>Total | Left<br>2.4                | Thru<br>2.5 | U-Turn<br>2.6 | App<br>Total |
| 0700 - 0715    | 4                                        | 26           | 0             | 30           | 0                          | 3           | 0             | 3            |
| 0715 - 0730    | 6                                        | 29           | 0             | 35           | 0                          | 5           | 0             | 5            |
| 0730 - 0745    | 6                                        | 18           | 0             | 24           | 1                          | 1           | 0             | 2            |
| 0745 - 0800    | 6                                        | 18           | 0             | 24           | 1                          | 4           | 0             | 5            |
| Hourly Total   | 22                                       | 91           | 0             | 113          | 2                          | 13          | 0             | 15           |
| 0800 - 0815    | 6                                        | 24           | 0             | 30           | 1                          | 2           | 0             | 3            |
| 0815 - 0830    | 2                                        | 18           | 0             | 20           | 1                          | 3           | 0             | 4            |
| 0830 - 0845    | 3                                        | 22           | 0             | 25           | 0                          | 2           | 0             | 2            |
| 0845 - 0900    | 1                                        | 20           | 0             | 21           | 1                          | 3           | 0             | 4            |
| Hourly Total   | 12                                       | 84           | 0             | 96           | 3                          | 10          | 0             | 13           |
| Grand Total    | 34                                       | 175          | 0             | 209          | 5                          | 23          | 0             | 28           |
| Approach %     | 16.27                                    | 83.73        | 0.00          | -            | 17.86                      | 82.14       | 0.00          | -            |
| Intersection % | 8.81                                     | 45.34        | 0.00          | 54.15        | 1.30                       | 5.96        | 0.00          | 7.25         |
| PHF            | 1.00                                     | 0.77         | 0.00          | 0.81         | 0.75                       | 0.60        | 0.00          | 0.75         |

| Westbound<br>KY-2053 Thixton Ln (East) |              |               |              |              |
|----------------------------------------|--------------|---------------|--------------|--------------|
| Left<br>2.7                            | Right<br>2.8 | U-Turn<br>2.9 | App<br>Total | Int<br>Total |
| 13                                     | 2            | 0             | 15           | 48           |
| 14                                     | 1            | 0             | 15           | 55           |
| 30                                     | 2            | 0             | 32           | 58           |
| 20                                     | 2            | 0             | 22           | 51           |
| 77                                     | 7            | 0             | 84           | 212          |
| 26                                     | 0            | 0             | 26           | 59           |
| 16                                     | 2            | 0             | 18           | 42           |
| 8                                      | 0            | 0             | 8            | 35           |
| 12                                     | 1            | 0             | 13           | 38           |
| 62                                     | 3            | 0             | 65           | 174          |
| 139                                    | 10           | 0             | 149          | 386          |
| 93.29                                  | 6.71         | 0.00          | -            | -            |
| 36.01                                  | 2.59         | 0.00          | 38.60        | -            |
| 0.75                                   | 0.63         | 0.00          | 0.74         | 0.94         |

### 1600 - 1800 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound<br>KY-2053 Thixton Ln (South) |              |               |              | Southbound<br>Oak Grove Rd |             |               |              |
|----------------|------------------------------------------|--------------|---------------|--------------|----------------------------|-------------|---------------|--------------|
|                | Thru<br>2.1                              | Right<br>2.2 | U-Turn<br>2.3 | App<br>Total | Left<br>2.4                | Thru<br>2.5 | U-Turn<br>2.6 | App<br>Total |
| 1600 - 1615    | 3                                        | 29           | 0             | 32           | 3                          | 6           | 0             | 9            |
| 1615 - 1630    | 1                                        | 24           | 0             | 25           | 2                          | 8           | 0             | 10           |
| 1630 - 1645    | 6                                        | 43           | 0             | 49           | 3                          | 5           | 0             | 8            |
| 1645 - 1700    | 1                                        | 45           | 0             | 46           | 1                          | 1           | 0             | 2            |
| Hourly Total   | 11                                       | 141          | 0             | 152          | 9                          | 20          | 0             | 29           |
| 1700 - 1715    | 1                                        | 37           | 0             | 38           | 2                          | 7           | 0             | 9            |
| 1715 - 1730    | 1                                        | 32           | 0             | 33           | 0                          | 6           | 0             | 6            |
| 1730 - 1745    | 3                                        | 29           | 0             | 32           | 3                          | 6           | 0             | 9            |
| 1745 - 1800    | 4                                        | 23           | 0             | 27           | 2                          | 5           | 0             | 7            |
| Hourly Total   | 9                                        | 121          | 0             | 130          | 7                          | 24          | 0             | 31           |
| Grand Total    | 20                                       | 262          | 0             | 282          | 16                         | 44          | 0             | 60           |
| Approach %     | 7.09                                     | 92.91        | 0.00          | -            | 26.67                      | 73.33       | 0.00          | -            |
| Intersection % | 3.44                                     | 45.09        | 0.00          | 48.54        | 2.75                       | 7.57        | 0.00          | 10.33        |
| PHF            | 0.38                                     | 0.87         | 0.00          | 0.85         | 0.50                       | 0.68        | 0.00          | 0.69         |

| Westbound<br>KY-2053 Thixton Ln (East) |              |               |              |              |
|----------------------------------------|--------------|---------------|--------------|--------------|
| Left<br>2.7                            | Right<br>2.8 | U-Turn<br>2.9 | App<br>Total | Int<br>Total |
| 22                                     | 1            | 0             | 23           | 64           |
| 18                                     | 0            | 0             | 18           | 53           |
| 30                                     | 2            | 0             | 32           | 89           |
| 38                                     | 2            | 0             | 40           | 88           |
| 108                                    | 5            | 0             | 113          | 294          |
| 32                                     | 3            | 0             | 35           | 82           |
| 29                                     | 0            | 0             | 29           | 68           |
| 32                                     | 0            | 0             | 32           | 73           |
| 30                                     | 0            | 0             | 30           | 64           |
| 123                                    | 3            | 0             | 126          | 287          |
| 231                                    | 8            | 0             | 239          | 581          |
| 96.65                                  | 3.35         | 0.00          | -            | -            |
| 39.76                                  | 1.38         | 0.00          | 41.14        | -            |
| 0.85                                   | 0.58         | 0.00          | 0.85         | 0.92         |



# Oak Grove Subdivision Traffic Impact Study

## Classified Turn Movement Count || All vehicles

Jefferson County, KY



**Marr Traffic**  
DATA COLLECTION

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### Site 3 of 4

KY-2053 Thixton Ln (South)  
Pebble Trace

### Date

Tuesday, August 24, 2021

### Weather

Fair  
87°F

### Lat/Long

38.089712°, -85.598788°

### 0700 - 0900 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound<br>KY-2053 Thixton Ln (South) |              |               |              | Southbound<br>Pebble Trace |             |               |              | Westbound<br>KY-2053 Thixton Ln (East) |              |               |              |              |
|----------------|------------------------------------------|--------------|---------------|--------------|----------------------------|-------------|---------------|--------------|----------------------------------------|--------------|---------------|--------------|--------------|
|                | Thru<br>3.1                              | Right<br>3.2 | U-Turn<br>3.3 | App<br>Total | Left<br>3.4                | Thru<br>3.5 | U-Turn<br>3.6 | App<br>Total | Left<br>3.7                            | Right<br>3.8 | U-Turn<br>3.9 | App<br>Total | Int<br>Total |
|                | 0                                        | 20           | 0             | 20           | 11                         | 5           | 0             | 16           | 12                                     | 2            | 0             | 14           | 50           |
| 0700 - 0715    | 1                                        | 18           | 0             | 19           | 11                         | 6           | 0             | 17           | 12                                     | 5            | 0             | 17           | 53           |
| 0715 - 0730    | 4                                        | 17           | 0             | 21           | 8                          | 6           | 0             | 14           | 32                                     | 2            | 0             | 34           | 69           |
| 0730 - 0745    | 2                                        | 19           | 0             | 21           | 6                          | 6           | 0             | 12           | 20                                     | 4            | 0             | 24           | 57           |
| 0745 - 0800    | 7                                        | 74           | 0             | 81           | 36                         | 23          | 0             | 59           | 76                                     | 13           | 0             | 89           | 229          |
| Hourly Total   | 3                                        | 20           | 0             | 23           | 10                         | 8           | 0             | 18           | 24                                     | 4            | 0             | 28           | 69           |
| 0800 - 0815    | 1                                        | 14           | 0             | 15           | 8                          | 10          | 0             | 18           | 17                                     | 3            | 0             | 20           | 53           |
| 0815 - 0830    | 0                                        | 17           | 0             | 17           | 6                          | 2           | 0             | 8            | 6                                      | 3            | 0             | 9            | 34           |
| 0830 - 0845    | 0                                        | 15           | 0             | 15           | 4                          | 2           | 0             | 6            | 14                                     | 2            | 0             | 16           | 37           |
| 0845 - 0900    | 4                                        | 66           | 0             | 70           | 28                         | 22          | 0             | 50           | 61                                     | 12           | 0             | 73           | 193          |
| Hourly Total   | 11                                       | 140          | 0             | 151          | 64                         | 45          | 0             | 109          | 137                                    | 25           | 0             | 162          | 422          |
| Grand Total    | 7.28                                     | 92.72        | 0.00          | -            | 58.72                      | 41.28       | 0.00          | -            | 84.57                                  | 15.43        | 0.00          | -            | -            |
| Approach %     | 2.61                                     | 33.18        | 0.00          | 35.78        | 15.17                      | 10.66       | 0.00          | 25.83        | 32.46                                  | 5.92         | 0.00          | 38.39        | -            |
| Intersection % | 0.63                                     | 0.93         | 0.00          | 0.91         | 0.80                       | 0.81        | 0.00          | 0.85         | 0.69                                   | 0.75         | 0.00          | 0.76         | 0.90         |
| PHF            |                                          |              |               |              |                            |             |               |              |                                        |              |               |              |              |

### 1600 - 1800 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound<br>KY-2053 Thixton Ln (South) |              |               |              | Southbound<br>Pebble Trace |             |               |              | Westbound<br>KY-2053 Thixton Ln (East) |              |               |              |              |
|----------------|------------------------------------------|--------------|---------------|--------------|----------------------------|-------------|---------------|--------------|----------------------------------------|--------------|---------------|--------------|--------------|
|                | Thru<br>3.1                              | Right<br>3.2 | U-Turn<br>3.3 | App<br>Total | Left<br>3.4                | Thru<br>3.5 | U-Turn<br>3.6 | App<br>Total | Left<br>3.7                            | Right<br>3.8 | U-Turn<br>3.9 | App<br>Total | Int<br>Total |
|                | 1                                        | 25           | 0             | 26           | 6                          | 1           | 0             | 7            | 20                                     | 9            | 0             | 29           | 62           |
| 1600 - 1615    | 3                                        | 23           | 0             | 26           | 4                          | 4           | 0             | 8            | 18                                     | 7            | 0             | 25           | 59           |
| 1615 - 1630    | 7                                        | 44           | 0             | 51           | 5                          | 2           | 0             | 7            | 30                                     | 5            | 0             | 35           | 93           |
| 1630 - 1645    | 4                                        | 38           | 0             | 42           | 5                          | 2           | 0             | 7            | 24                                     | 9            | 0             | 33           | 82           |
| 1645 - 1700    | 15                                       | 130          | 0             | 145          | 20                         | 9           | 0             | 29           | 92                                     | 30           | 0             | 122          | 296          |
| Hourly Total   | 4                                        | 33           | 0             | 37           | 4                          | 2           | 0             | 6            | 29                                     | 15           | 0             | 44           | 87           |
| 1700 - 1715    | 7                                        | 29           | 0             | 36           | 5                          | 3           | 0             | 8            | 31                                     | 5            | 0             | 36           | 80           |
| 1715 - 1730    | 8                                        | 29           | 0             | 37           | 4                          | 2           | 0             | 6            | 21                                     | 17           | 0             | 38           | 81           |
| 1730 - 1745    | 9                                        | 22           | 0             | 31           | 5                          | 2           | 0             | 7            | 26                                     | 9            | 0             | 35           | 73           |
| 1745 - 1800    | 28                                       | 113          | 0             | 141          | 18                         | 9           | 0             | 27           | 107                                    | 46           | 0             | 153          | 321          |
| Hourly Total   | 43                                       | 243          | 0             | 286          | 38                         | 18          | 0             | 56           | 199                                    | 76           | 0             | 275          | 617          |
| Grand Total    | 15.03                                    | 84.97        | 0.00          | -            | 67.86                      | 32.14       | 0.00          | -            | 72.36                                  | 27.64        | 0.00          | -            | -            |
| Approach %     | 6.97                                     | 39.38        | 0.00          | 46.35        | 6.16                       | 2.92        | 0.00          | 9.08         | 32.25                                  | 12.32        | 0.00          | 44.57        | -            |
| Intersection % | 0.79                                     | 0.82         | 0.00          | 0.81         | 0.95                       | 0.75        | 0.00          | 0.88         | 0.92                                   | 0.57         | 0.00          | 0.84         | 0.92         |
| PHF            |                                          |              |               |              |                            |             |               |              |                                        |              |               |              |              |



# Oak Grove Subdivision Traffic Impact Study

## Classified Turn Movement Count || All vehicles

Jefferson County, KY



**Marr Traffic**  
DATA COLLECTION

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### Site 1 of 4

US-150 Bardstown Rd (South)  
US-150 Bardstown Rd (North)  
KY-2053 Thixton Ln

### Date

Tuesday, August 24, 2021

### Weather

Fair  
87°F

### Lat/Long

38.100655°, -85.565656°

### 0700 - 0900 (Weekday 2h Session) (08-24-2021)

All vehicles

| TIME           | Northbound                  |             |               |              | Southbound                  |              |               |              | Eastbound          |              |               |              | Int<br>Total |
|----------------|-----------------------------|-------------|---------------|--------------|-----------------------------|--------------|---------------|--------------|--------------------|--------------|---------------|--------------|--------------|
|                | US-150 Bardstown Rd (South) |             |               |              | US-150 Bardstown Rd (North) |              |               |              | KY-2053 Thixton Ln |              |               |              |              |
|                | Left<br>1.1                 | Thru<br>1.2 | U-Turn<br>1.3 | App<br>Total | Thru<br>1.4                 | Right<br>1.5 | U-Turn<br>1.6 | App<br>Total | Left<br>1.7        | Right<br>1.8 | U-Turn<br>1.9 | App<br>Total |              |
| 0700 - 0715    | 40                          | 455         | 0             | 495          | 178                         | 8            | 0             | 186          | 28                 | 17           | 0             | 45           | 726          |
| 0715 - 0730    | 76                          | 459         | 0             | 535          | 157                         | 9            | 0             | 166          | 30                 | 9            | 0             | 39           | 740          |
| 0730 - 0745    | 75                          | 335         | 0             | 410          | 196                         | 26           | 0             | 222          | 25                 | 14           | 0             | 39           | 671          |
| 0745 - 0800    | 40                          | 338         | 0             | 378          | 227                         | 13           | 1             | 241          | 14                 | 13           | 0             | 27           | 646          |
| Hourly Total   | 231                         | 1587        | 0             | 1818         | 758                         | 56           | 1             | 815          | 97                 | 53           | 0             | 150          | 2783         |
| 0800 - 0815    | 20                          | 336         | 0             | 356          | 198                         | 27           | 0             | 225          | 29                 | 10           | 0             | 39           | 620          |
| 0815 - 0830    | 24                          | 351         | 0             | 375          | 194                         | 16           | 0             | 210          | 26                 | 10           | 0             | 36           | 621          |
| 0830 - 0845    | 17                          | 347         | 0             | 364          | 159                         | 8            | 0             | 167          | 34                 | 13           | 0             | 47           | 578          |
| 0845 - 0900    | 20                          | 308         | 0             | 328          | 169                         | 13           | 0             | 182          | 26                 | 13           | 0             | 39           | 549          |
| Hourly Total   | 81                          | 1342        | 0             | 1423         | 720                         | 64           | 0             | 784          | 115                | 46           | 0             | 161          | 2368         |
| Grand Total    | 312                         | 2929        | 0             | 3241         | 1478                        | 120          | 1             | 1599         | 212                | 99           | 0             | 311          | 5151         |
| Approach %     | 9.63                        | 90.37       | 0.00          | -            | 92.43                       | 7.50         | 0.06          | -            | 68.17              | 31.83        | 0.00          | -            |              |
| Intersection % | 6.06                        | 56.86       | 0.00          | 62.92        | 28.69                       | 2.33         | 0.02          | 31.04        | 4.12               | 1.92         | 0.00          | 6.04         |              |
| PHF            | 0.76                        | 0.86        | 0.00          | 0.85         | 0.83                        | 0.54         | 0.25          | 0.85         | 0.81               | 0.78         | 0.00          | 0.83         | 0.94         |

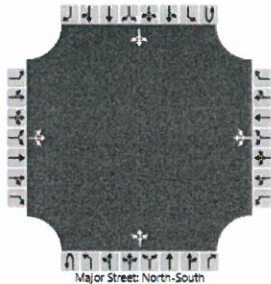
### 1600 - 1800 (Weekday 2h Session) (08-24-2021)

All vehicles

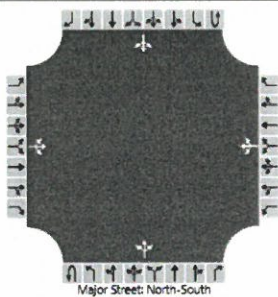
| TIME           | Northbound                  |             |               |              | Southbound                  |              |               |              | Eastbound          |              |               |              | Int<br>Total |
|----------------|-----------------------------|-------------|---------------|--------------|-----------------------------|--------------|---------------|--------------|--------------------|--------------|---------------|--------------|--------------|
|                | US-150 Bardstown Rd (South) |             |               |              | US-150 Bardstown Rd (North) |              |               |              | KY-2053 Thixton Ln |              |               |              |              |
|                | Left<br>1.1                 | Thru<br>1.2 | U-Turn<br>1.3 | App<br>Total | Thru<br>1.4                 | Right<br>1.5 | U-Turn<br>1.6 | App<br>Total | Left<br>1.7        | Right<br>1.8 | U-Turn<br>1.9 | App<br>Total |              |
| 1600 - 1615    | 23                          | 274         | 0             | 297          | 375                         | 37           | 0             | 412          | 23                 | 50           | 0             | 73           | 782          |
| 1615 - 1630    | 18                          | 257         | 0             | 275          | 422                         | 44           | 0             | 466          | 18                 | 44           | 0             | 62           | 803          |
| 1630 - 1645    | 23                          | 258         | 0             | 281          | 426                         | 37           | 0             | 463          | 27                 | 58           | 0             | 85           | 829          |
| 1645 - 1700    | 34                          | 294         | 0             | 328          | 414                         | 40           | 0             | 454          | 35                 | 62           | 0             | 97           | 879          |
| Hourly Total   | 98                          | 1083        | 0             | 1181         | 1637                        | 158          | 0             | 1795         | 103                | 214          | 0             | 317          | 3293         |
| 1700 - 1715    | 22                          | 249         | 0             | 271          | 503                         | 32           | 0             | 535          | 22                 | 43           | 0             | 65           | 871          |
| 1715 - 1730    | 23                          | 240         | 0             | 263          | 441                         | 32           | 0             | 473          | 23                 | 58           | 0             | 81           | 817          |
| 1730 - 1745    | 18                          | 252         | 0             | 270          | 483                         | 33           | 0             | 516          | 26                 | 48           | 0             | 74           | 860          |
| 1745 - 1800    | 19                          | 251         | 0             | 270          | 463                         | 40           | 0             | 503          | 28                 | 34           | 0             | 62           | 835          |
| Hourly Total   | 82                          | 992         | 0             | 1074         | 1890                        | 137          | 0             | 2027         | 99                 | 183          | 0             | 282          | 3383         |
| Grand Total    | 180                         | 2075        | 0             | 2255         | 3527                        | 295          | 0             | 3822         | 202                | 397          | 0             | 599          | 6676         |
| Approach %     | 7.98                        | 92.02       | 0.00          | -            | 92.28                       | 7.72         | 0.00          | -            | 33.72              | 66.28        | 0.00          | -            |              |
| Intersection % | 2.70                        | 31.08       | 0.00          | 33.78        | 52.83                       | 4.42         | 0.00          | 57.25        | 3.03               | 5.95         | 0.00          | 8.97         |              |
| PHF            | 0.71                        | 0.88        | 0.00          | 0.86         | 0.92                        | 0.86         | 0.00          | 0.92         | 0.76               | 0.85         | 0.00          | 0.82         | 0.97         |



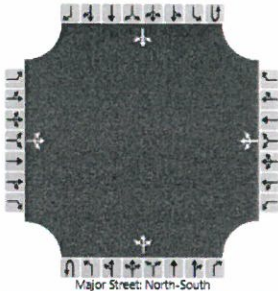
## HCS Reports

| HCS7 Two-Way Stop-Control Report                                                                               |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
|----------------------------------------------------------------------------------------------------------------|---------------------------------------|------|------|------|-----------|------|------|----------------------------|---------------------------|------|-----|----|------------|------|-----|---|
| General Information                                                                                            |                                       |      |      |      |           |      |      | Site Information           |                           |      |     |    |            |      |     |   |
| Analyst                                                                                                        | DBZ                                   |      |      |      |           |      |      | Intersection               | Cedar Creek at Ind School |      |     |    |            |      |     |   |
| Agency/Co.                                                                                                     | Diane B Zimmerman Traffic Engineering |      |      |      |           |      |      | Jurisdiction               |                           |      |     |    |            |      |     |   |
| Date Performed                                                                                                 | 9/19/2021                             |      |      |      |           |      |      | East/West Street           | Independence School Road  |      |     |    |            |      |     |   |
| Analysis Year                                                                                                  | 2021                                  |      |      |      |           |      |      | North/South Street         | Cedar Creek Road          |      |     |    |            |      |     |   |
| Time Analyzed                                                                                                  | AM Peak                               |      |      |      |           |      |      | Peak Hour Factor           | 0.65                      |      |     |    |            |      |     |   |
| Intersection Orientation                                                                                       | North-South                           |      |      |      |           |      |      | Analysis Time Period (hrs) | 0.25                      |      |     |    |            |      |     |   |
| Project Description                                                                                            | Oak Grove                             |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Lanes                                                                                                          |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <br>Major Street: North-South |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Vehicle Volumes and Adjustments                                                                                |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Approach                                                                                                       | Eastbound                             |      |      |      | Westbound |      |      |                            | Northbound                |      |     |    | Southbound |      |     |   |
| Movement                                                                                                       | U                                     | L    | T    | R    | U         | L    | T    | R                          | U                         | L    | T   | R  | U          | L    | T   | R |
| Priority                                                                                                       |                                       | 10   | 11   | 12   |           | 7    | 8    | 9                          | 1U                        | 1    | 2   | 3  | 4U         | 4    | 5   | 6 |
| Number of Lanes                                                                                                |                                       | 0    | 1    | 0    |           | 0    | 1    | 0                          | 0                         | 0    | 1   | 0  | 0          | 0    | 1   | 0 |
| Configuration                                                                                                  |                                       |      | LTR  |      |           |      | LTR  |                            |                           |      | LTR |    |            |      | LTR |   |
| Volume (veh/h)                                                                                                 |                                       | 3    | 0    | 6    |           | 93   | 1    | 9                          |                           | 2    | 21  | 24 |            | 3    | 30  | 1 |
| Percent Heavy Vehicles (%)                                                                                     |                                       | 0    | 0    | 0    |           | 1    | 0    | 0                          |                           | 0    |     |    |            | 33   |     |   |
| Proportion Time Blocked                                                                                        |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Percent Grade (%)                                                                                              | 0                                     |      |      |      | 0         |      |      |                            |                           |      |     |    |            |      |     |   |
| Right Turn Channelized                                                                                         |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Median Type   Storage                                                                                          | Undivided                             |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Critical and Follow-up Headways                                                                                |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Base Critical Headway (sec)                                                                                    |                                       | 7.1  | 6.5  | 6.2  |           | 7.1  | 6.5  | 6.2                        |                           | 4.1  |     |    |            | 4.1  |     |   |
| Critical Headway (sec)                                                                                         |                                       | 7.10 | 6.50 | 6.20 |           | 7.11 | 6.50 | 6.20                       |                           | 4.10 |     |    |            | 4.43 |     |   |
| Base Follow-Up Headway (sec)                                                                                   |                                       | 3.5  | 4.0  | 3.3  |           | 3.5  | 4.0  | 3.3                        |                           | 2.2  |     |    |            | 2.2  |     |   |
| Follow-Up Headway (sec)                                                                                        |                                       | 3.50 | 4.00 | 3.30 |           | 3.51 | 4.00 | 3.30                       |                           | 2.20 |     |    |            | 2.50 |     |   |
| Delay, Queue Length, and Level of Service                                                                      |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Flow Rate, v (veh/h)                                                                                           |                                       |      | 14   |      |           |      | 158  |                            |                           | 3    |     |    |            | 5    |     |   |
| Capacity, c (veh/h)                                                                                            |                                       |      | 958  |      |           |      | 861  |                            |                           | 1573 |     |    |            | 1356 |     |   |
| v/c Ratio                                                                                                      |                                       |      | 0.01 |      |           |      | 0.18 |                            |                           | 0.00 |     |    |            | 0.00 |     |   |
| 95% Queue Length, Q <sub>95</sub> (veh)                                                                        |                                       |      | 0.0  |      |           |      | 0.7  |                            |                           | 0.0  |     |    |            | 0.0  |     |   |
| Control Delay (s/veh)                                                                                          |                                       |      | 8.8  |      |           |      | 10.1 |                            |                           | 7.3  |     |    |            | 7.7  |     |   |
| Level of Service (LOS)                                                                                         |                                       |      | A    |      |           |      | B    |                            |                           | A    |     |    |            | A    |     |   |
| Approach Delay (s/veh)                                                                                         | 8.8                                   |      |      |      | 10.1      |      |      |                            | 0.3                       |      |     |    | 0.7        |      |     |   |
| Approach LOS                                                                                                   | A                                     |      |      |      | B         |      |      |                            |                           |      |     |    |            |      |     |   |



| HCS7 Two-Way Stop-Control Report                                                                                                                                 |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|------|------|------|-----------|------|------|----------------------------|---------------------------|------|-----|----|------------|------|-----|---|
| General Information                                                                                                                                              |                                       |      |      |      |           |      |      | Site Information           |                           |      |     |    |            |      |     |   |
| Analyst                                                                                                                                                          | DBZ                                   |      |      |      |           |      |      | Intersection               | Cedar Creek at Ind School |      |     |    |            |      |     |   |
| Agency/Co.                                                                                                                                                       | Diane B Zimmerman Traffic Engineering |      |      |      |           |      |      | Jurisdiction               |                           |      |     |    |            |      |     |   |
| Date Performed                                                                                                                                                   | 9/19/2021                             |      |      |      |           |      |      | East/West Street           | Independence School Road  |      |     |    |            |      |     |   |
| Analysis Year                                                                                                                                                    | 2027                                  |      |      |      |           |      |      | North/South Street         | Cedar Creek Road          |      |     |    |            |      |     |   |
| Time Analyzed                                                                                                                                                    | AM Peak No Build                      |      |      |      |           |      |      | Peak Hour Factor           | 0.65                      |      |     |    |            |      |     |   |
| Intersection Orientation                                                                                                                                         | North-South                           |      |      |      |           |      |      | Analysis Time Period (hrs) | 0.25                      |      |     |    |            |      |     |   |
| Project Description                                                                                                                                              | Oak Grove                             |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Lanes</b>                                                                                                                                                     |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
|  <p style="text-align: center; font-size: small;">Major Street: North-South</p> |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Vehicle Volumes and Adjustments</b>                                                                                                                           |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Approach                                                                                                                                                         | Eastbound                             |      |      |      | Westbound |      |      |                            | Northbound                |      |     |    | Southbound |      |     |   |
| Movement                                                                                                                                                         | U                                     | L    | T    | R    | U         | L    | T    | R                          | U                         | L    | T   | R  | U          | L    | T   | R |
| Priority                                                                                                                                                         |                                       | 10   | 11   | 12   |           | 7    | 8    | 9                          | 1U                        | 1    | 2   | 3  | 4U         | 4    | 5   | 6 |
| Number of Lanes                                                                                                                                                  |                                       | 0    | 1    | 0    |           | 0    | 1    | 0                          | 0                         | 0    | 1   | 0  | 0          | 0    | 1   | 0 |
| Configuration                                                                                                                                                    |                                       |      | LTR  |      |           |      | LTR  |                            |                           |      | LTR |    |            |      | LTR |   |
| Volume (veh/h)                                                                                                                                                   |                                       | 3    | 0    | 6    |           | 105  | 1    | 10                         |                           | 2    | 24  | 27 |            | 3    | 34  | 1 |
| Percent Heavy Vehicles (%)                                                                                                                                       |                                       | 0    | 0    | 0    |           | 1    | 0    | 0                          |                           | 0    |     |    |            | 33   |     |   |
| Proportion Time Blocked                                                                                                                                          |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Percent Grade (%)                                                                                                                                                | 0                                     |      |      |      | 0         |      |      |                            |                           |      |     |    |            |      |     |   |
| Right Turn Channelized                                                                                                                                           |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Median Type   Storage                                                                                                                                            | Undivided                             |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Critical and Follow-up Headways</b>                                                                                                                           |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Base Critical Headway (sec)                                                                                                                                      |                                       | 7.1  | 6.5  | 6.2  |           | 7.1  | 6.5  | 6.2                        |                           | 4.1  |     |    |            | 4.1  |     |   |
| Critical Headway (sec)                                                                                                                                           |                                       | 7.10 | 6.50 | 6.20 |           | 7.11 | 6.50 | 6.20                       |                           | 4.10 |     |    |            | 4.43 |     |   |
| Base Follow-Up Headway (sec)                                                                                                                                     |                                       | 3.5  | 4.0  | 3.3  |           | 3.5  | 4.0  | 3.3                        |                           | 2.2  |     |    |            | 2.2  |     |   |
| Follow-Up Headway (sec)                                                                                                                                          |                                       | 3.50 | 4.00 | 3.30 |           | 3.51 | 4.00 | 3.30                       |                           | 2.20 |     |    |            | 2.50 |     |   |
| <b>Delay, Queue Length, and Level of Service</b>                                                                                                                 |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Flow Rate, v (veh/h)                                                                                                                                             |                                       |      | 14   |      |           |      | 178  |                            |                           | 3    |     |    |            | 5    |     |   |
| Capacity, c (veh/h)                                                                                                                                              |                                       |      | 945  |      |           |      | 845  |                            |                           | 1564 |     |    |            | 1345 |     |   |
| v/c Ratio                                                                                                                                                        |                                       |      | 0.01 |      |           |      | 0.21 |                            |                           | 0.00 |     |    |            | 0.00 |     |   |
| 95% Queue Length, Q <sub>95</sub> (veh)                                                                                                                          |                                       |      | 0.0  |      |           |      | 0.8  |                            |                           | 0.0  |     |    |            | 0.0  |     |   |
| Control Delay (s/veh)                                                                                                                                            |                                       |      | 8.9  |      |           |      | 10.4 |                            |                           | 7.3  |     |    |            | 7.7  |     |   |
| Level of Service (LOS)                                                                                                                                           |                                       |      | A    |      |           |      | B    |                            |                           | A    |     |    |            | A    |     |   |
| Approach Delay (s/veh)                                                                                                                                           | 8.9                                   |      |      |      | 10.4      |      |      |                            | 0.3                       |      |     |    | 0.6        |      |     |   |
| Approach LOS                                                                                                                                                     | A                                     |      |      |      | B         |      |      |                            |                           |      |     |    |            |      |     |   |



| HCS7 Two-Way Stop-Control Report                                                                                                                                 |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|------|------|------|-----------|------|------|----------------------------|---------------------------|------|-----|----|------------|------|-----|---|
| General Information                                                                                                                                              |                                       |      |      |      |           |      |      | Site Information           |                           |      |     |    |            |      |     |   |
| Analyst                                                                                                                                                          | DBZ                                   |      |      |      |           |      |      | Intersection               | Cedar Creek at Ind School |      |     |    |            |      |     |   |
| Agency/Co.                                                                                                                                                       | Diane B Zimmerman Traffic Engineering |      |      |      |           |      |      | Jurisdiction               |                           |      |     |    |            |      |     |   |
| Date Performed                                                                                                                                                   | 9/19/2021                             |      |      |      |           |      |      | East/West Street           | Independence School Road  |      |     |    |            |      |     |   |
| Analysis Year                                                                                                                                                    | 2027                                  |      |      |      |           |      |      | North/South Street         | Cedar Creek Road          |      |     |    |            |      |     |   |
| Time Analyzed                                                                                                                                                    | AM Peak Build                         |      |      |      |           |      |      | Peak Hour Factor           | 0.65                      |      |     |    |            |      |     |   |
| Intersection Orientation                                                                                                                                         | North-South                           |      |      |      |           |      |      | Analysis Time Period (hrs) | 0.25                      |      |     |    |            |      |     |   |
| Project Description                                                                                                                                              | Oak Grove                             |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Lanes</b>                                                                                                                                                     |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
|  <p style="font-size: small; text-align: center;">Major Street: North-South</p> |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Vehicle Volumes and Adjustments</b>                                                                                                                           |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Approach                                                                                                                                                         | Eastbound                             |      |      |      | Westbound |      |      |                            | Northbound                |      |     |    | Southbound |      |     |   |
| Movement                                                                                                                                                         | U                                     | L    | T    | R    | U         | L    | T    | R                          | U                         | L    | T   | R  | U          | L    | T   | R |
| Priority                                                                                                                                                         |                                       | 10   | 11   | 12   |           | 7    | 8    | 9                          | 1U                        | 1    | 2   | 3  | 4U         | 4    | 5   | 6 |
| Number of Lanes                                                                                                                                                  |                                       | 0    | 1    | 0    |           | 0    | 1    | 0                          | 0                         | 0    | 1   | 0  | 0          | 0    | 1   | 0 |
| Configuration                                                                                                                                                    |                                       |      | LTR  |      |           |      | LTR  |                            |                           |      | LTR |    |            |      | LTR |   |
| Volume (veh/h)                                                                                                                                                   |                                       | 3    | 0    | 6    |           | 131  | 1    | 13                         |                           | 2    | 24  | 36 |            | 4    | 34  | 1 |
| Percent Heavy Vehicles (%)                                                                                                                                       |                                       | 0    | 0    | 0    |           | 1    | 0    | 0                          |                           | 0    |     |    |            | 25   |     |   |
| Proportion Time Blocked                                                                                                                                          |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Percent Grade (%)                                                                                                                                                | 0                                     |      |      |      | 0         |      |      |                            |                           |      |     |    |            |      |     |   |
| Right Turn Channelized                                                                                                                                           |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Median Type   Storage                                                                                                                                            | Undivided                             |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| <b>Critical and Follow-up Headways</b>                                                                                                                           |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Base Critical Headway (sec)                                                                                                                                      |                                       | 7.1  | 6.5  | 6.2  |           | 7.1  | 6.5  | 6.2                        |                           | 4.1  |     |    |            | 4.1  |     |   |
| Critical Headway (sec)                                                                                                                                           |                                       | 7.10 | 6.50 | 6.20 |           | 7.11 | 6.50 | 6.20                       |                           | 4.10 |     |    |            | 4.35 |     |   |
| Base Follow-Up Headway (sec)                                                                                                                                     |                                       | 3.5  | 4.0  | 3.3  |           | 3.5  | 4.0  | 3.3                        |                           | 2.2  |     |    |            | 2.2  |     |   |
| Follow-Up Headway (sec)                                                                                                                                          |                                       | 3.50 | 4.00 | 3.30 |           | 3.51 | 4.00 | 3.30                       |                           | 2.20 |     |    |            | 2.43 |     |   |
| <b>Delay, Queue Length, and Level of Service</b>                                                                                                                 |                                       |      |      |      |           |      |      |                            |                           |      |     |    |            |      |     |   |
| Flow Rate, v (veh/h)                                                                                                                                             |                                       |      | 14   |      |           |      | 223  |                            |                           | 3    |     |    |            | 6    |     |   |
| Capacity, c (veh/h)                                                                                                                                              |                                       |      | 936  |      |           |      | 833  |                            |                           | 1564 |     |    |            | 1370 |     |   |
| v/c Ratio                                                                                                                                                        |                                       |      | 0.01 |      |           |      | 0.27 |                            |                           | 0.00 |     |    |            | 0.00 |     |   |
| 95% Queue Length, Q <sub>95</sub> (veh)                                                                                                                          |                                       |      | 0.0  |      |           |      | 1.1  |                            |                           | 0.0  |     |    |            | 0.0  |     |   |
| Control Delay (s/veh)                                                                                                                                            |                                       |      | 8.9  |      |           |      | 10.9 |                            |                           | 7.3  |     |    |            | 7.6  |     |   |
| Level of Service (LOS)                                                                                                                                           |                                       |      | A    |      |           |      | B    |                            |                           | A    |     |    |            | A    |     |   |
| Approach Delay (s/veh)                                                                                                                                           | 8.9                                   |      |      |      | 10.9      |      |      |                            | 0.3                       |      |     |    | 0.8        |      |     |   |
| Approach LOS                                                                                                                                                     | A                                     |      |      |      | B         |      |      |                            |                           |      |     |    |            |      |     |   |



| HCS7 Two-Way Stop-Control Report                 |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
|--------------------------------------------------|---------------------------------------|------|------|------|-----------|------|------|----------------------------|---------------------------|------|-----|-----|------------|------|-----|---|
| General Information                              |                                       |      |      |      |           |      |      | Site Information           |                           |      |     |     |            |      |     |   |
| Analyst                                          | DBZ                                   |      |      |      |           |      |      | Intersection               | Cedar Creek at Ind School |      |     |     |            |      |     |   |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |      |      |      |           |      |      | Jurisdiction               |                           |      |     |     |            |      |     |   |
| Date Performed                                   | 9/19/2021                             |      |      |      |           |      |      | East/West Street           | Independence School Road  |      |     |     |            |      |     |   |
| Analysis Year                                    | 2021                                  |      |      |      |           |      |      | North/South Street         | Cedar Creek Road          |      |     |     |            |      |     |   |
| Time Analyzed                                    | PM Peak                               |      |      |      |           |      |      | Peak Hour Factor           | 0.74                      |      |     |     |            |      |     |   |
| Intersection Orientation                         | North-South                           |      |      |      |           |      |      | Analysis Time Period (hrs) | 0.25                      |      |     |     |            |      |     |   |
| Project Description                              | Oak Grove                             |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| <b>Lanes</b>                                     |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| <p>Major Street: North-South</p>                 |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Approach                                         | Eastbound                             |      |      |      | Westbound |      |      |                            | Northbound                |      |     |     | Southbound |      |     |   |
| Movement                                         | U                                     | L    | T    | R    | U         | L    | T    | R                          | U                         | L    | T   | R   | U          | L    | T   | R |
| Priority                                         |                                       | 10   | 11   | 12   |           | 7    | 8    | 9                          | 1U                        | 1    | 2   | 3   | 4U         | 4    | 5   | 6 |
| Number of Lanes                                  |                                       | 0    | 1    | 0    |           | 0    | 1    | 0                          | 0                         | 0    | 1   | 0   | 0          | 0    | 1   | 0 |
| Configuration                                    |                                       |      | LTR  |      |           |      | LTR  |                            |                           |      | LTR |     |            |      | LTR |   |
| Volume (veh/h)                                   |                                       | 2    | 0    | 7    |           | 31   | 2    | 9                          |                           | 10   | 57  | 152 |            | 13   | 39  | 2 |
| Percent Heavy Vehicles (%)                       |                                       | 0    | 0    | 0    |           | 0    | 0    | 11                         |                           | 0    |     |     |            | 8    |     |   |
| Proportion Time Blocked                          |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Percent Grade (%)                                | 0                                     |      |      |      | 0         |      |      |                            |                           |      |     |     |            |      |     |   |
| Right Turn Channelized                           |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Median Type   Storage                            | Undivided                             |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| <b>Critical and Follow-up Headways</b>           |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Base Critical Headway (sec)                      |                                       | 7.1  | 6.5  | 6.2  |           | 7.1  | 6.5  | 6.2                        |                           | 4.1  |     |     |            | 4.1  |     |   |
| Critical Headway (sec)                           |                                       | 7.10 | 6.50 | 6.20 |           | 7.10 | 6.50 | 6.31                       |                           | 4.10 |     |     |            | 4.18 |     |   |
| Base Follow-Up Headway (sec)                     |                                       | 3.5  | 4.0  | 3.3  |           | 3.5  | 4.0  | 3.3                        |                           | 2.2  |     |     |            | 2.2  |     |   |
| Follow-Up Headway (sec)                          |                                       | 3.50 | 4.00 | 3.30 |           | 3.50 | 4.00 | 3.40                       |                           | 2.20 |     |     |            | 2.27 |     |   |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Flow Rate, v (veh/h)                             |                                       |      | 12   |      |           |      | 57   |                            |                           | 14   |     |     |            | 18   |     |   |
| Capacity, c (veh/h)                              |                                       |      | 895  |      |           |      | 670  |                            |                           | 1562 |     |     |            | 1246 |     |   |
| v/c Ratio                                        |                                       |      | 0.01 |      |           |      | 0.08 |                            |                           | 0.01 |     |     |            | 0.01 |     |   |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |      | 0.0  |      |           |      | 0.3  |                            |                           | 0.0  |     |     |            | 0.0  |     |   |
| Control Delay (s/veh)                            |                                       |      | 9.1  |      |           |      | 10.9 |                            |                           | 7.3  |     |     |            | 7.9  |     |   |
| Level of Service (LOS)                           |                                       |      | A    |      |           |      | B    |                            |                           | A    |     |     |            | A    |     |   |
| Approach Delay (s/veh)                           | 9.1                                   |      |      |      | 10.9      |      |      |                            | 0.4                       |      |     |     | 2.0        |      |     |   |
| Approach LOS                                     | A                                     |      |      |      | B         |      |      |                            |                           |      |     |     |            |      |     |   |



Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Two-Way Stop-Control Report                 |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
|--------------------------------------------------|---------------------------------------|------|------|------|-----------|------|------|----------------------------|---------------------------|------|-----|-----|------------|------|-----|---|
| General Information                              |                                       |      |      |      |           |      |      | Site Information           |                           |      |     |     |            |      |     |   |
| Analyst                                          | DBZ                                   |      |      |      |           |      |      | Intersection               | Cedar Creek at Ind School |      |     |     |            |      |     |   |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |      |      |      |           |      |      | Jurisdiction               |                           |      |     |     |            |      |     |   |
| Date Performed                                   | 9/19/2021                             |      |      |      |           |      |      | East/West Street           | Independence School Road  |      |     |     |            |      |     |   |
| Analysis Year                                    | 2027                                  |      |      |      |           |      |      | North/South Street         | Cedar Creek Road          |      |     |     |            |      |     |   |
| Time Analyzed                                    | PM Peak No Build                      |      |      |      |           |      |      | Peak Hour Factor           | 0.74                      |      |     |     |            |      |     |   |
| Intersection Orientation                         | North-South                           |      |      |      |           |      |      | Analysis Time Period (hrs) | 0.25                      |      |     |     |            |      |     |   |
| Project Description                              | Oak Grove                             |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| <b>Lanes</b>                                     |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| <p>Major Street: North-South</p>                 |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Approach                                         | Eastbound                             |      |      |      | Westbound |      |      |                            | Northbound                |      |     |     | Southbound |      |     |   |
| Movement                                         | U                                     | L    | T    | R    | U         | L    | T    | R                          | U                         | L    | T   | R   | U          | L    | T   | R |
| Priority                                         |                                       | 10   | 11   | 12   |           | 7    | 8    | 9                          | 1U                        | 1    | 2   | 3   | 4U         | 4    | 5   | 6 |
| Number of Lanes                                  |                                       | 0    | 1    | 0    |           | 0    | 1    | 0                          |                           | 0    | 1   | 0   |            | 0    | 1   | 0 |
| Configuration                                    |                                       |      | LTR  |      |           |      | LTR  |                            |                           |      | LTR |     |            |      | LTR |   |
| Volume (veh/h)                                   |                                       | 2    | 0    | 7    |           | 35   | 2    | 10                         |                           | 10   | 64  | 171 |            | 15   | 44  | 2 |
| Percent Heavy Vehicles (%)                       |                                       | 0    | 0    | 0    |           | 0    | 0    | 11                         |                           | 0    |     |     |            | 8    |     |   |
| Proportion Time Blocked                          |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Percent Grade (%)                                | 0                                     |      |      |      | 0         |      |      |                            |                           |      |     |     |            |      |     |   |
| Right Turn Channelized                           |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Median Type   Storage                            | Undivided                             |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| <b>Critical and Follow-up Headways</b>           |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Base Critical Headway (sec)                      |                                       | 7.1  | 6.5  | 6.2  |           | 7.1  | 6.5  | 6.2                        |                           | 4.1  |     |     |            | 4.1  |     |   |
| Critical Headway (sec)                           |                                       | 7.10 | 6.50 | 6.20 |           | 7.10 | 6.50 | 6.31                       |                           | 4.10 |     |     |            | 4.18 |     |   |
| Base Follow-Up Headway (sec)                     |                                       | 3.5  | 4.0  | 3.3  |           | 3.5  | 4.0  | 3.3                        |                           | 2.2  |     |     |            | 2.2  |     |   |
| Follow-Up Headway (sec)                          |                                       | 3.50 | 4.00 | 3.30 |           | 3.50 | 4.00 | 3.40                       |                           | 2.20 |     |     |            | 2.27 |     |   |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |      |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |
| Flow Rate, v (veh/h)                             |                                       |      | 12   |      |           |      | 64   |                            |                           | 14   |     |     |            | 20   |     |   |
| Capacity, c (veh/h)                              |                                       |      | 874  |      |           |      | 637  |                            |                           | 1554 |     |     |            | 1209 |     |   |
| v/c Ratio                                        |                                       |      | 0.01 |      |           |      | 0.10 |                            |                           | 0.01 |     |     |            | 0.02 |     |   |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |      | 0.0  |      |           |      | 0.3  |                            |                           | 0.0  |     |     |            | 0.1  |     |   |
| Control Delay (s/veh)                            |                                       |      | 9.2  |      |           |      | 11.3 |                            |                           | 7.3  |     |     |            | 8.0  |     |   |
| Level of Service (LOS)                           |                                       |      | A    |      |           |      | B    |                            |                           | A    |     |     |            | A    |     |   |
| Approach Delay (s/veh)                           | 9.2                                   |      |      |      | 11.3      |      |      |                            | 0.4                       |      |     |     | 2.1        |      |     |   |
| Approach LOS                                     | A                                     |      |      |      | B         |      |      |                            |                           |      |     |     |            |      |     |   |

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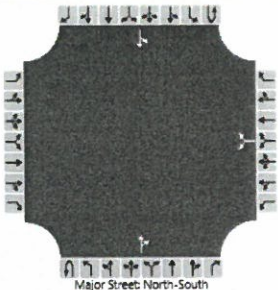
| HCS7 Two-Way Stop-Control Report                             |                                       |           |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |  |  |  |
|--------------------------------------------------------------|---------------------------------------|-----------|------|------|-----------|------|------|----------------------------|---------------------------|------|-----|-----|------------|------|-----|---|--|--|--|
| General Information                                          |                                       |           |      |      |           |      |      | Site Information           |                           |      |     |     |            |      |     |   |  |  |  |
| Analyst                                                      | DBZ                                   |           |      |      |           |      |      | Intersection               | Cedar Creek at Ind School |      |     |     |            |      |     |   |  |  |  |
| Agency/Co.                                                   | Diane B Zimmerman Traffic Engineering |           |      |      |           |      |      | Jurisdiction               |                           |      |     |     |            |      |     |   |  |  |  |
| Date Performed                                               | 9/19/2021                             |           |      |      |           |      |      | East/West Street           | Independence School Road  |      |     |     |            |      |     |   |  |  |  |
| Analysis Year                                                | 2027                                  |           |      |      |           |      |      | North/South Street         | Cedar Creek Road          |      |     |     |            |      |     |   |  |  |  |
| Time Analyzed                                                | PM Peak Build                         |           |      |      |           |      |      | Peak Hour Factor           | 0.74                      |      |     |     |            |      |     |   |  |  |  |
| Intersection Orientation                                     | North-South                           |           |      |      |           |      |      | Analysis Time Period (hrs) | 0.25                      |      |     |     |            |      |     |   |  |  |  |
| Project Description                                          | Oak Grove                             |           |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |  |  |  |
| <b>Lanes</b>                                                 |                                       |           |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |  |  |  |
| <p style="text-align: center;">Major Street: North-South</p> |                                       |           |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |  |  |  |
| <b>Vehicle Volumes and Adjustments</b>                       |                                       |           |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |  |  |  |
| Approach                                                     | Eastbound                             |           |      |      | Westbound |      |      |                            | Northbound                |      |     |     | Southbound |      |     |   |  |  |  |
| Movement                                                     | U                                     | L         | T    | R    | U         | L    | T    | R                          | U                         | L    | T   | R   | U          | L    | T   | R |  |  |  |
| Priority                                                     |                                       | 10        | 11   | 12   |           | 7    | 8    | 9                          | 1U                        | 1    | 2   | 3   | 4U         | 4    | 5   | 6 |  |  |  |
| Number of Lanes                                              |                                       | 0         | 1    | 0    |           | 0    | 1    | 0                          | 0                         | 0    | 1   | 0   | 0          | 0    | 1   | 0 |  |  |  |
| Configuration                                                |                                       |           | LTR  |      |           |      | LTR  |                            |                           |      | LTR |     |            |      | LTR |   |  |  |  |
| Volume (veh/h)                                               |                                       | 2         | 0    | 7    |           | 50   | 2    | 14                         |                           | 10   | 64  | 200 |            | 18   | 44  | 2 |  |  |  |
| Percent Heavy Vehicles (%)                                   |                                       | 0         | 0    | 0    |           | 0    | 0    | 11                         |                           | 0    |     |     |            | 8    |     |   |  |  |  |
| Proportion Time Blocked                                      |                                       |           |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |  |  |  |
| Percent Grade (%)                                            |                                       | 0         |      |      |           | 0    |      |                            |                           |      |     |     |            |      |     |   |  |  |  |
| Right Turn Channelized                                       |                                       |           |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |  |  |  |
| Median Type   Storage                                        |                                       | Undivided |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |  |  |  |
| <b>Critical and Follow-up Headways</b>                       |                                       |           |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |  |  |  |
| Base Critical Headway (sec)                                  |                                       | 7.1       | 6.5  | 6.2  |           | 7.1  | 6.5  | 6.2                        |                           | 4.1  |     |     |            | 4.1  |     |   |  |  |  |
| Critical Headway (sec)                                       |                                       | 7.10      | 6.50 | 6.20 |           | 7.10 | 6.50 | 6.31                       |                           | 4.10 |     |     |            | 4.18 |     |   |  |  |  |
| Base Follow-Up Headway (sec)                                 |                                       | 3.5       | 4.0  | 3.3  |           | 3.5  | 4.0  | 3.3                        |                           | 2.2  |     |     |            | 2.2  |     |   |  |  |  |
| Follow-Up Headway (sec)                                      |                                       | 3.50      | 4.00 | 3.30 |           | 3.50 | 4.00 | 3.40                       |                           | 2.20 |     |     |            | 2.27 |     |   |  |  |  |
| <b>Delay, Queue Length, and Level of Service</b>             |                                       |           |      |      |           |      |      |                            |                           |      |     |     |            |      |     |   |  |  |  |
| Flow Rate, v (veh/h)                                         |                                       |           | 12   |      |           |      | 89   |                            |                           | 14   |     |     |            | 24   |     |   |  |  |  |
| Capacity, c (veh/h)                                          |                                       |           | 857  |      |           |      | 611  |                            |                           | 1554 |     |     |            | 1169 |     |   |  |  |  |
| v/c Ratio                                                    |                                       |           | 0.01 |      |           |      | 0.15 |                            |                           | 0.01 |     |     |            | 0.02 |     |   |  |  |  |
| 95% Queue Length, Q <sub>95</sub> (veh)                      |                                       |           | 0.0  |      |           |      | 0.5  |                            |                           | 0.0  |     |     |            | 0.1  |     |   |  |  |  |
| Control Delay (s/veh)                                        |                                       |           | 9.3  |      |           |      | 11.9 |                            |                           | 7.3  |     |     |            | 8.1  |     |   |  |  |  |
| Level of Service (LOS)                                       |                                       |           | A    |      |           |      | B    |                            |                           | A    |     |     |            | A    |     |   |  |  |  |
| Approach Delay (s/veh)                                       |                                       | 9.3       |      |      |           | 11.9 |      |                            |                           | 0.3  |     |     |            | 2.4  |     |   |  |  |  |
| Approach LOS                                                 |                                       | A         |      |      |           | B    |      |                            |                           |      |     |     |            |      |     |   |  |  |  |



Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Two-Way Stop-Control Report                 |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
|--------------------------------------------------|---------------------------------------|----|----|----|-----------|------|----|----------------------------|----------------------|---|----|----|------------|------|----|---|
| General Information                              |                                       |    |    |    |           |      |    | Site Information           |                      |   |    |    |            |      |    |   |
| Analyst                                          | DBZ                                   |    |    |    |           |      |    | Intersection               | Thixton at Oak Grove |   |    |    |            |      |    |   |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |    |    |    |           |      |    | Jurisdiction               |                      |   |    |    |            |      |    |   |
| Date Performed                                   | 9/19/2021                             |    |    |    |           |      |    | East/West Street           | Thixton              |   |    |    |            |      |    |   |
| Analysis Year                                    | 2021                                  |    |    |    |           |      |    | North/South Street         | Oak Grove/Thixton    |   |    |    |            |      |    |   |
| Time Analyzed                                    | AM Peak                               |    |    |    |           |      |    | Peak Hour Factor           | 0.94                 |   |    |    |            |      |    |   |
| Intersection Orientation                         | North-South                           |    |    |    |           |      |    | Analysis Time Period (hrs) | 0.25                 |   |    |    |            |      |    |   |
| Project Description                              | Oak Grove                             |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| <b>Lanes</b>                                     |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| <p>Major Street: North-South</p>                 |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| Approach                                         | Eastbound                             |    |    |    | Westbound |      |    |                            | Northbound           |   |    |    | Southbound |      |    |   |
| Movement                                         | U                                     | L  | T  | R  | U         | L    | T  | R                          | U                    | L | T  | R  | U          | L    | T  | R |
| Priority                                         |                                       | 10 | 11 | 12 |           | 7    | 8  | 9                          | 1U                   | 1 | 2  | 3  | 4U         | 4    | 5  | 6 |
| Number of Lanes                                  |                                       | 0  | 0  | 0  |           | 0    | 1  | 0                          | 0                    | 0 | 1  | 0  | 0          | 0    | 1  | 0 |
| Configuration                                    |                                       |    |    |    |           |      | LR |                            |                      |   |    | TR |            | LT   |    |   |
| Volume (veh/h)                                   |                                       |    |    |    |           | 90   |    | 5                          |                      |   | 24 | 89 |            | 3    | 12 |   |
| Percent Heavy Vehicles (%)                       |                                       |    |    |    |           | 6    |    | 0                          |                      |   |    |    |            | 67   |    |   |
| Proportion Time Blocked                          |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| Percent Grade (%)                                | 0                                     |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| Right Turn Channelized                           |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| Median Type   Storage                            | Undivided                             |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| <b>Critical and Follow-up Headways</b>           |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| Base Critical Headway (sec)                      |                                       |    |    |    |           | 7.1  |    | 6.2                        |                      |   |    |    |            | 4.1  |    |   |
| Critical Headway (sec)                           |                                       |    |    |    |           | 6.46 |    | 6.20                       |                      |   |    |    |            | 4.77 |    |   |
| Base Follow-Up Headway (sec)                     |                                       |    |    |    |           | 3.5  |    | 3.3                        |                      |   |    |    |            | 2.2  |    |   |
| Follow-Up Headway (sec)                          |                                       |    |    |    |           | 3.55 |    | 3.30                       |                      |   |    |    |            | 2.80 |    |   |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |    |    |    |           |      |    |                            |                      |   |    |    |            |      |    |   |
| Flow Rate, v (veh/h)                             |                                       |    |    |    |           | 101  |    |                            |                      |   |    |    |            | 3    |    |   |
| Capacity, c (veh/h)                              |                                       |    |    |    |           | 901  |    |                            |                      |   |    |    |            | 1147 |    |   |
| v/c Ratio                                        |                                       |    |    |    |           | 0.11 |    |                            |                      |   |    |    |            | 0.00 |    |   |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |    |    |    |           | 0.4  |    |                            |                      |   |    |    |            | 0.0  |    |   |
| Control Delay (s/veh)                            |                                       |    |    |    |           | 9.5  |    |                            |                      |   |    |    |            | 8.1  |    |   |
| Level of Service (LOS)                           |                                       |    |    |    |           | A    |    |                            |                      |   |    |    |            | A    |    |   |
| Approach Delay (s/veh)                           |                                       |    |    |    | 9.5       |      |    |                            |                      |   |    |    | 1.6        |      |    |   |
| Approach LOS                                     |                                       |    |    |    | A         |      |    |                            |                      |   |    |    |            |      |    |   |



| HCS7 Two-Way Stop-Control Report                                                                                                            |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|----|----|----|-----------|------|----|----------------------------|----------------------|---|----|-----|------------|------|----|---|
| General Information                                                                                                                         |                                       |    |    |    |           |      |    | Site Information           |                      |   |    |     |            |      |    |   |
| Analyst                                                                                                                                     | DBZ                                   |    |    |    |           |      |    | Intersection               | Thixton at Oak Grove |   |    |     |            |      |    |   |
| Agency/Co.                                                                                                                                  | Diane B Zimmerman Traffic Engineering |    |    |    |           |      |    | Jurisdiction               |                      |   |    |     |            |      |    |   |
| Date Performed                                                                                                                              | 9/19/2021                             |    |    |    |           |      |    | East/West Street           | Thixton              |   |    |     |            |      |    |   |
| Analysis Year                                                                                                                               | 2027                                  |    |    |    |           |      |    | North/South Street         | Oak Grove/Thixton    |   |    |     |            |      |    |   |
| Time Analyzed                                                                                                                               | AM Peak No Build                      |    |    |    |           |      |    | Peak Hour Factor           | 0.94                 |   |    |     |            |      |    |   |
| Intersection Orientation                                                                                                                    | North-South                           |    |    |    |           |      |    | Analysis Time Period (hrs) | 0.25                 |   |    |     |            |      |    |   |
| Project Description                                                                                                                         | Oak Grove                             |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| <b>Lanes</b>                                                                                                                                |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
|  <p style="margin-top: 5px;">Major Street: North-South</p> |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| <b>Vehicle Volumes and Adjustments</b>                                                                                                      |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| Approach                                                                                                                                    | Eastbound                             |    |    |    | Westbound |      |    |                            | Northbound           |   |    |     | Southbound |      |    |   |
| Movement                                                                                                                                    | U                                     | L  | T  | R  | U         | L    | T  | R                          | U                    | L | T  | R   | U          | L    | T  | R |
| Priority                                                                                                                                    |                                       | 10 | 11 | 12 |           | 7    | 8  | 9                          | 1U                   | 1 | 2  | 3   | 4U         | 4    | 5  | 6 |
| Number of Lanes                                                                                                                             |                                       | 0  | 0  | 0  |           | 0    | 1  | 0                          | 0                    | 0 | 1  | 0   | 0          | 0    | 1  | 0 |
| Configuration                                                                                                                               |                                       |    |    |    |           |      | LR |                            |                      |   |    | TR  |            | LT   |    |   |
| Volume (veh/h)                                                                                                                              |                                       |    |    |    |           | 101  |    | 5                          |                      |   | 24 | 100 |            | 3    | 12 |   |
| Percent Heavy Vehicles (%)                                                                                                                  |                                       |    |    |    |           | 6    |    | 0                          |                      |   |    |     |            | 67   |    |   |
| Proportion Time Blocked                                                                                                                     |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| Percent Grade (%)                                                                                                                           | 0                                     |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| Right Turn Channelized                                                                                                                      |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| Median Type   Storage                                                                                                                       | Undivided                             |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| <b>Critical and Follow-up Headways</b>                                                                                                      |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| Base Critical Headway (sec)                                                                                                                 |                                       |    |    |    |           | 7.1  |    | 6.2                        |                      |   |    |     |            | 4.1  |    |   |
| Critical Headway (sec)                                                                                                                      |                                       |    |    |    |           | 6.46 |    | 6.20                       |                      |   |    |     |            | 4.77 |    |   |
| Base Follow-Up Headway (sec)                                                                                                                |                                       |    |    |    |           | 3.5  |    | 3.3                        |                      |   |    |     |            | 2.2  |    |   |
| Follow-Up Headway (sec)                                                                                                                     |                                       |    |    |    |           | 3.55 |    | 3.30                       |                      |   |    |     |            | 2.80 |    |   |
| <b>Delay, Queue Length, and Level of Service</b>                                                                                            |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| Flow Rate, v (veh/h)                                                                                                                        |                                       |    |    |    |           | 113  |    |                            |                      |   |    |     |            | 3    |    |   |
| Capacity, c (veh/h)                                                                                                                         |                                       |    |    |    |           | 893  |    |                            |                      |   |    |     |            | 1135 |    |   |
| v/c Ratio                                                                                                                                   |                                       |    |    |    |           | 0.13 |    |                            |                      |   |    |     |            | 0.00 |    |   |
| 95% Queue Length, Q <sub>95</sub> (veh)                                                                                                     |                                       |    |    |    |           | 0.4  |    |                            |                      |   |    |     |            | 0.0  |    |   |
| Control Delay (s/veh)                                                                                                                       |                                       |    |    |    |           | 9.6  |    |                            |                      |   |    |     |            | 8.2  |    |   |
| Level of Service (LOS)                                                                                                                      |                                       |    |    |    |           | A    |    |                            |                      |   |    |     |            | A    |    |   |
| Approach Delay (s/veh)                                                                                                                      |                                       |    |    |    | 9.6       |      |    |                            |                      |   |    |     | 1.7        |      |    |   |
| Approach LOS                                                                                                                                |                                       |    |    |    | A         |      |    |                            |                      |   |    |     |            |      |    |   |



Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Two-Way Stop-Control Report                 |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
|--------------------------------------------------|---------------------------------------|----|----|----|-----------|------|----|----------------------------|----------------------|---|----|-----|------------|------|----|---|
| General Information                              |                                       |    |    |    |           |      |    | Site Information           |                      |   |    |     |            |      |    |   |
| Analyst                                          | DBZ                                   |    |    |    |           |      |    | Intersection               | Thixton at Oak Grove |   |    |     |            |      |    |   |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |    |    |    |           |      |    | Jurisdiction               |                      |   |    |     |            |      |    |   |
| Date Performed                                   | 9/19/2021                             |    |    |    |           |      |    | East/West Street           | Thixton              |   |    |     |            |      |    |   |
| Analysis Year                                    | 2027                                  |    |    |    |           |      |    | North/South Street         | Oak Grove/Thixton    |   |    |     |            |      |    |   |
| Time Analyzed                                    | AM Peak Build                         |    |    |    |           |      |    | Peak Hour Factor           | 0.94                 |   |    |     |            |      |    |   |
| Intersection Orientation                         | North-South                           |    |    |    |           |      |    | Analysis Time Period (hrs) | 0.25                 |   |    |     |            |      |    |   |
| Project Description                              | Oak Grove                             |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| <b>Lanes</b>                                     |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| <p>Major Street: North-South</p>                 |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| Approach                                         | Eastbound                             |    |    |    | Westbound |      |    |                            | Northbound           |   |    |     | Southbound |      |    |   |
| Movement                                         | U                                     | L  | T  | R  | U         | L    | T  | R                          | U                    | L | T  | R   | U          | L    | T  | R |
| Priority                                         |                                       | 10 | 11 | 12 |           | 7    | 8  | 9                          | 1U                   | 1 | 2  | 3   | 4U         | 4    | 5  | 6 |
| Number of Lanes                                  |                                       | 0  | 0  | 0  |           | 0    | 1  | 0                          | 0                    | 0 | 1  | 0   | 0          | 0    | 1  | 0 |
| Configuration                                    |                                       |    |    |    |           |      | LR |                            |                      |   |    | TR  |            | LT   |    |   |
| Volume (veh/h)                                   |                                       |    |    |    |           | 106  |    | 24                         |                      |   | 35 | 116 |            | 59   | 46 |   |
| Percent Heavy Vehicles (%)                       |                                       |    |    |    |           | 6    |    | 0                          |                      |   |    |     |            | 67   |    |   |
| Proportion Time Blocked                          |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| Percent Grade (%)                                |                                       |    |    |    | 0         |      |    |                            |                      |   |    |     |            |      |    |   |
| Right Turn Channelized                           |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| Median Type   Storage                            | Undivided                             |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| <b>Critical and Follow-up Headways</b>           |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| Base Critical Headway (sec)                      |                                       |    |    |    |           | 7.1  |    | 6.2                        |                      |   |    |     |            | 4.1  |    |   |
| Critical Headway (sec)                           |                                       |    |    |    |           | 6.46 |    | 6.20                       |                      |   |    |     |            | 4.77 |    |   |
| Base Follow-Up Headway (sec)                     |                                       |    |    |    |           | 3.5  |    | 3.3                        |                      |   |    |     |            | 2.2  |    |   |
| Follow-Up Headway (sec)                          |                                       |    |    |    |           | 3.55 |    | 3.30                       |                      |   |    |     |            | 2.80 |    |   |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |      |    |   |
| Flow Rate, v (veh/h)                             |                                       |    |    |    |           | 138  |    |                            |                      |   |    |     |            | 63   |    |   |
| Capacity, c (veh/h)                              |                                       |    |    |    |           | 706  |    |                            |                      |   |    |     |            | 1104 |    |   |
| v/c Ratio                                        |                                       |    |    |    |           | 0.20 |    |                            |                      |   |    |     |            | 0.06 |    |   |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |    |    |    |           | 0.7  |    |                            |                      |   |    |     |            | 0.2  |    |   |
| Control Delay (s/veh)                            |                                       |    |    |    |           | 11.3 |    |                            |                      |   |    |     |            | 8.5  |    |   |
| Level of Service (LOS)                           |                                       |    |    |    |           | B    |    |                            |                      |   |    |     |            | A    |    |   |
| Approach Delay (s/veh)                           |                                       |    |    |    | 11.3      |      |    |                            |                      |   |    |     | 5.0        |      |    |   |
| Approach LOS                                     |                                       |    |    |    | B         |      |    |                            |                      |   |    |     |            |      |    |   |

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Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Two-Way Stop-Control Report                 |                                       |    |    |    |           |      |      |                            |            |   |   |                      |            |   |      |    |
|--------------------------------------------------|---------------------------------------|----|----|----|-----------|------|------|----------------------------|------------|---|---|----------------------|------------|---|------|----|
| General Information                              |                                       |    |    |    |           |      |      | Site Information           |            |   |   |                      |            |   |      |    |
| Analyst                                          | DBZ                                   |    |    |    |           |      |      | Intersection               |            |   |   | Thixton at Oak Grove |            |   |      |    |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |    |    |    |           |      |      | Jurisdiction               |            |   |   |                      |            |   |      |    |
| Date Performed                                   | 9/19/2021                             |    |    |    |           |      |      | East/West Street           |            |   |   | Thixton              |            |   |      |    |
| Analysis Year                                    | 2021                                  |    |    |    |           |      |      | North/South Street         |            |   |   | Oak Grove/Thixton    |            |   |      |    |
| Time Analyzed                                    | PM Peak                               |    |    |    |           |      |      | Peak Hour Factor           |            |   |   | 0.92                 |            |   |      |    |
| Intersection Orientation                         | North-South                           |    |    |    |           |      |      | Analysis Time Period (hrs) |            |   |   | 0.25                 |            |   |      |    |
| Project Description                              | Oak Grove                             |    |    |    |           |      |      |                            |            |   |   |                      |            |   |      |    |
| <b>Lanes</b>                                     |                                       |    |    |    |           |      |      |                            |            |   |   |                      |            |   |      |    |
|                                                  |                                       |    |    |    |           |      |      |                            |            |   |   |                      |            |   |      |    |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |    |    |    |           |      |      |                            |            |   |   |                      |            |   |      |    |
| Approach                                         | Eastbound                             |    |    |    | Westbound |      |      |                            | Northbound |   |   |                      | Southbound |   |      |    |
| Movement                                         | U                                     | L  | T  | R  | U         | L    | T    | R                          | U          | L | T | R                    | U          | L | T    | R  |
| Priority                                         |                                       | 10 | 11 | 12 |           | 7    | 8    | 9                          | 1U         | 1 | 2 | 3                    | 4U         | 4 | 5    | 6  |
| Number of Lanes                                  |                                       | 0  | 0  | 0  |           | 0    | 1    | 0                          | 0          | 0 | 1 | 0                    | 0          | 0 | 1    | 0  |
| Configuration                                    |                                       |    |    |    |           |      | LR   |                            |            |   |   | TR                   |            |   | LT   |    |
| Volume (veh/h)                                   |                                       |    |    |    |           | 129  |      | 7                          |            |   | 9 | 157                  |            |   | 6    | 19 |
| Percent Heavy Vehicles (%)                       |                                       |    |    |    |           | 3    |      | 0                          |            |   |   |                      |            |   | 17   |    |
| Proportion Time Blocked                          |                                       |    |    |    |           |      |      |                            |            |   |   |                      |            |   |      |    |
| Percent Grade (%)                                |                                       |    |    |    | 0         |      |      |                            |            |   |   |                      |            |   |      |    |
| Right Turn Channelized                           |                                       |    |    |    |           |      |      |                            |            |   |   |                      |            |   |      |    |
| Median Type   Storage                            |                                       |    |    |    | Undivided |      |      |                            |            |   |   |                      |            |   |      |    |
| <b>Critical and Follow-up Headways</b>           |                                       |    |    |    |           |      |      |                            |            |   |   |                      |            |   |      |    |
| Base Critical Headway (sec)                      |                                       |    |    |    |           | 7.1  |      | 6.2                        |            |   |   |                      |            |   | 4.1  |    |
| Critical Headway (sec)                           |                                       |    |    |    |           | 6.43 |      | 6.20                       |            |   |   |                      |            |   | 4.27 |    |
| Base Follow-Up Headway (sec)                     |                                       |    |    |    |           | 3.5  |      | 3.3                        |            |   |   |                      |            |   | 2.2  |    |
| Follow-Up Headway (sec)                          |                                       |    |    |    |           | 3.53 |      | 3.30                       |            |   |   |                      |            |   | 2.35 |    |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |    |    |    |           |      |      |                            |            |   |   |                      |            |   |      |    |
| Flow Rate, v (veh/h)                             |                                       |    |    |    |           |      | 148  |                            |            |   |   |                      |            |   | 7    |    |
| Capacity, c (veh/h)                              |                                       |    |    |    |           |      | 864  |                            |            |   |   |                      |            |   | 1309 |    |
| v/c Ratio                                        |                                       |    |    |    |           |      | 0.17 |                            |            |   |   |                      |            |   | 0.00 |    |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |    |    |    |           |      | 0.6  |                            |            |   |   |                      |            |   | 0.0  |    |
| Control Delay (s/veh)                            |                                       |    |    |    |           |      | 10.0 |                            |            |   |   |                      |            |   | 7.8  |    |
| Level of Service (LOS)                           |                                       |    |    |    |           |      | B    |                            |            |   |   |                      |            |   | A    |    |
| Approach Delay (s/veh)                           |                                       |    |    |    | 10.0      |      |      |                            |            |   |   |                      | 1.9        |   |      |    |
| Approach LOS                                     |                                       |    |    |    | B         |      |      |                            |            |   |   |                      |            |   |      |    |

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Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Two-Way Stop-Control Report                 |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
|--------------------------------------------------|---------------------------------------|----|----|----|-----------|------|----|----------------------------|----------------------|---|---|-----|------------|------|----|---|
| General Information                              |                                       |    |    |    |           |      |    | Site Information           |                      |   |   |     |            |      |    |   |
| Analyst                                          | DBZ                                   |    |    |    |           |      |    | Intersection               | Thixton at Oak Grove |   |   |     |            |      |    |   |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |    |    |    |           |      |    | Jurisdiction               |                      |   |   |     |            |      |    |   |
| Date Performed                                   | 9/19/2021                             |    |    |    |           |      |    | East/West Street           | Thixton              |   |   |     |            |      |    |   |
| Analysis Year                                    | 2027                                  |    |    |    |           |      |    | North/South Street         | Oak Grove/Thixton    |   |   |     |            |      |    |   |
| Time Analyzed                                    | PM Peak No Build                      |    |    |    |           |      |    | Peak Hour Factor           | 0.92                 |   |   |     |            |      |    |   |
| Intersection Orientation                         | North-South                           |    |    |    |           |      |    | Analysis Time Period (hrs) | 0.25                 |   |   |     |            |      |    |   |
| Project Description                              | Oak Grove                             |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| <b>Lanes</b>                                     |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
|                                                  |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Approach                                         | Eastbound                             |    |    |    | Westbound |      |    |                            | Northbound           |   |   |     | Southbound |      |    |   |
| Movement                                         | U                                     | L  | T  | R  | U         | L    | T  | R                          | U                    | L | T | R   | U          | L    | T  | R |
| Priority                                         |                                       | 10 | 11 | 12 |           | 7    | 8  | 9                          | 1U                   | 1 | 2 | 3   | 4U         | 4    | 5  | 6 |
| Number of Lanes                                  |                                       | 0  | 0  | 0  |           | 0    | 1  | 0                          | 0                    | 0 | 1 | 0   | 0          | 0    | 1  | 0 |
| Configuration                                    |                                       |    |    |    |           |      | LR |                            |                      |   |   | TR  |            | LT   |    |   |
| Volume (veh/h)                                   |                                       |    |    |    |           | 145  |    | 7                          |                      |   | 9 | 177 |            | 6    | 19 |   |
| Percent Heavy Vehicles (%)                       |                                       |    |    |    |           | 3    |    | 0                          |                      |   |   |     |            | 17   |    |   |
| Proportion Time Blocked                          |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Percent Grade (%)                                |                                       |    |    |    | 0         |      |    |                            |                      |   |   |     |            |      |    |   |
| Right Turn Channelized                           |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Median Type   Storage                            | Undivided                             |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| <b>Critical and Follow-up Headways</b>           |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Base Critical Headway (sec)                      |                                       |    |    |    |           | 7.1  |    | 6.2                        |                      |   |   |     |            | 4.1  |    |   |
| Critical Headway (sec)                           |                                       |    |    |    |           | 6.43 |    | 6.20                       |                      |   |   |     |            | 4.27 |    |   |
| Base Follow-Up Headway (sec)                     |                                       |    |    |    |           | 3.5  |    | 3.3                        |                      |   |   |     |            | 2.2  |    |   |
| Follow-Up Headway (sec)                          |                                       |    |    |    |           | 3.53 |    | 3.30                       |                      |   |   |     |            | 2.35 |    |   |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |    |    |    |           |      |    |                            |                      |   |   |     |            |      |    |   |
| Flow Rate, v (veh/h)                             |                                       |    |    |    |           | 165  |    |                            |                      |   |   |     |            | 7    |    |   |
| Capacity, c (veh/h)                              |                                       |    |    |    |           | 851  |    |                            |                      |   |   |     |            | 1285 |    |   |
| v/c Ratio                                        |                                       |    |    |    |           | 0.19 |    |                            |                      |   |   |     |            | 0.01 |    |   |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |    |    |    |           | 0.7  |    |                            |                      |   |   |     |            | 0.0  |    |   |
| Control Delay (s/veh)                            |                                       |    |    |    |           | 10.2 |    |                            |                      |   |   |     |            | 7.8  |    |   |
| Level of Service (LOS)                           |                                       |    |    |    |           | B    |    |                            |                      |   |   |     |            | A    |    |   |
| Approach Delay (s/veh)                           |                                       |    |    |    | 10.2      |      |    |                            |                      |   |   |     | 1.9        |      |    |   |
| Approach LOS                                     |                                       |    |    |    | B         |      |    |                            |                      |   |   |     |            |      |    |   |

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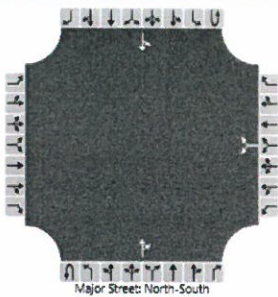
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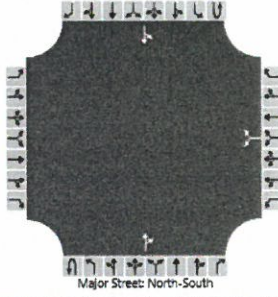


| HCS7 Two-Way Stop-Control Report                 |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |   |      |    |
|--------------------------------------------------|---------------------------------------|----|----|----|-----------|------|----|----------------------------|----------------------|---|----|-----|------------|---|------|----|
| General Information                              |                                       |    |    |    |           |      |    | Site Information           |                      |   |    |     |            |   |      |    |
| Analyst                                          | DBZ                                   |    |    |    |           |      |    | Intersection               | Thixton at Oak Grove |   |    |     |            |   |      |    |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |    |    |    |           |      |    | Jurisdiction               |                      |   |    |     |            |   |      |    |
| Date Performed                                   | 9/19/2021                             |    |    |    |           |      |    | East/West Street           | Thixton              |   |    |     |            |   |      |    |
| Analysis Year                                    | 2027                                  |    |    |    |           |      |    | North/South Street         | Oak Grove/Thixton    |   |    |     |            |   |      |    |
| Time Analyzed                                    | PM Peak Build                         |    |    |    |           |      |    | Peak Hour Factor           | 0.92                 |   |    |     |            |   |      |    |
| Intersection Orientation                         | North-South                           |    |    |    |           |      |    | Analysis Time Period (hrs) | 0.25                 |   |    |     |            |   |      |    |
| Project Description                              | Oak Grove                             |    |    |    |           |      |    |                            |                      |   |    |     |            |   |      |    |
| <b>Lanes</b>                                     |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |   |      |    |
| <p>Major Street: North-South</p>                 |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |   |      |    |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |   |      |    |
| Approach                                         | Eastbound                             |    |    |    | Westbound |      |    |                            | Northbound           |   |    |     | Southbound |   |      |    |
| Movement                                         | U                                     | L  | T  | R  | U         | L    | T  | R                          | U                    | L | T  | R   | U          | L | T    | R  |
| Priority                                         |                                       | 10 | 11 | 12 |           | 7    | 8  | 9                          | 1U                   | 1 | 2  | 3   | 4U         | 4 | 5    | 6  |
| Number of Lanes                                  |                                       | 0  | 0  | 0  |           | 0    | 1  | 0                          | 0                    | 0 | 1  | 0   | 0          | 0 | 1    | 0  |
| Configuration                                    |                                       |    |    |    |           |      | LR |                            |                      |   |    | TR  |            |   | LT   |    |
| Volume (veh/h)                                   |                                       |    |    |    |           | 163  |    | 70                         |                      |   | 47 | 187 |            |   | 43   | 42 |
| Percent Heavy Vehicles (%)                       |                                       |    |    |    |           | 3    |    | 0                          |                      |   |    |     |            |   | 2    |    |
| Proportion Time Blocked                          |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |   |      |    |
| Percent Grade (%)                                |                                       |    |    |    | 0         |      |    |                            |                      |   |    |     |            |   |      |    |
| Right Turn Channelized                           |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |   |      |    |
| Median Type   Storage                            | Undivided                             |    |    |    |           |      |    |                            |                      |   |    |     |            |   |      |    |
| <b>Critical and Follow-up Headways</b>           |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |   |      |    |
| Base Critical Headway (sec)                      |                                       |    |    |    |           | 7.1  |    | 6.2                        |                      |   |    |     |            |   | 4.1  |    |
| Critical Headway (sec)                           |                                       |    |    |    |           | 6.43 |    | 6.20                       |                      |   |    |     |            |   | 4.12 |    |
| Base Follow-Up Headway (sec)                     |                                       |    |    |    |           | 3.5  |    | 3.3                        |                      |   |    |     |            |   | 2.2  |    |
| Follow-Up Headway (sec)                          |                                       |    |    |    |           | 3.53 |    | 3.30                       |                      |   |    |     |            |   | 2.22 |    |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |    |    |    |           |      |    |                            |                      |   |    |     |            |   |      |    |
| Flow Rate, v (veh/h)                             |                                       |    |    |    |           | 253  |    |                            |                      |   |    |     |            |   | 47   |    |
| Capacity, c (veh/h)                              |                                       |    |    |    |           | 727  |    |                            |                      |   |    |     |            |   | 1311 |    |
| v/c Ratio                                        |                                       |    |    |    |           | 0.35 |    |                            |                      |   |    |     |            |   | 0.04 |    |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       |    |    |    |           | 1.6  |    |                            |                      |   |    |     |            |   | 0.1  |    |
| Control Delay (s/veh)                            |                                       |    |    |    |           | 12.6 |    |                            |                      |   |    |     |            |   | 7.8  |    |
| Level of Service (LOS)                           |                                       |    |    |    |           | B    |    |                            |                      |   |    |     |            |   | A    |    |
| Approach Delay (s/veh)                           |                                       |    |    |    | 12.6      |      |    |                            |                      |   |    |     | 4.1        |   |      |    |
| Approach LOS                                     |                                       |    |    |    | B         |      |    |                            |                      |   |    |     |            |   |      |    |



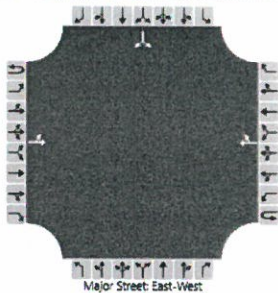
| HCS7 Two-Way Stop-Control Report                                                  |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
|-----------------------------------------------------------------------------------|---------------------------------------|----|----|----|-----------|------|----|----------------------------|-----------------------|---|----|----|------------|------|---|---|
| General Information                                                               |                                       |    |    |    |           |      |    | Site Information           |                       |   |    |    |            |      |   |   |
| Analyst                                                                           | DBZ                                   |    |    |    |           |      |    | Intersection               | Oak Grove at Entrance |   |    |    |            |      |   |   |
| Agency/Co.                                                                        | Diane B Zimmerman Traffic Engineering |    |    |    |           |      |    | Jurisdiction               |                       |   |    |    |            |      |   |   |
| Date Performed                                                                    | 9/19/2021                             |    |    |    |           |      |    | East/West Street           | Oak Grove             |   |    |    |            |      |   |   |
| Analysis Year                                                                     | 2027                                  |    |    |    |           |      |    | North/South Street         | Oak Grove/Entrance    |   |    |    |            |      |   |   |
| Time Analyzed                                                                     | AM Peak Build                         |    |    |    |           |      |    | Peak Hour Factor           | 0.94                  |   |    |    |            |      |   |   |
| Intersection Orientation                                                          | North-South                           |    |    |    |           |      |    | Analysis Time Period (hrs) | 0.25                  |   |    |    |            |      |   |   |
| Project Description                                                               | Oak Grove                             |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
| <b>Lanes</b>                                                                      |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
|  |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
| <b>Vehicle Volumes and Adjustments</b>                                            |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
| Approach                                                                          | Eastbound                             |    |    |    | Westbound |      |    |                            | Northbound            |   |    |    | Southbound |      |   |   |
| Movement                                                                          | U                                     | L  | T  | R  | U         | L    | T  | R                          | U                     | L | T  | R  | U          | L    | T | R |
| Priority                                                                          |                                       | 10 | 11 | 12 |           | 7    | 8  | 9                          | 1U                    | 1 | 2  | 3  | 4U         | 4    | 5 | 6 |
| Number of Lanes                                                                   |                                       | 0  | 0  | 0  |           | 0    | 1  | 0                          | 0                     | 0 | 1  | 0  | 0          | 0    | 1 | 0 |
| Configuration                                                                     |                                       |    |    |    |           |      | LR |                            |                       |   |    | TR |            | LT   |   |   |
| Volume (veh/h)                                                                    |                                       |    |    |    |           | 30   |    | 29                         |                       |   | 29 | 90 |            | 15   | 9 |   |
| Percent Heavy Vehicles (%)                                                        |                                       |    |    |    |           | 0    |    | 3                          |                       |   |    |    |            | 7    |   |   |
| Proportion Time Blocked                                                           |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
| Percent Grade (%)                                                                 |                                       |    |    |    | 0         |      |    |                            |                       |   |    |    |            |      |   |   |
| Right Turn Channelized                                                            |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
| Median Type   Storage                                                             |                                       |    |    |    | Undivided |      |    |                            |                       |   |    |    |            |      |   |   |
| <b>Critical and Follow-up Headways</b>                                            |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
| Base Critical Headway (sec)                                                       |                                       |    |    |    |           | 7.1  |    | 6.2                        |                       |   |    |    |            | 4.1  |   |   |
| Critical Headway (sec)                                                            |                                       |    |    |    |           | 6.40 |    | 6.23                       |                       |   |    |    |            | 4.17 |   |   |
| Base Follow-Up Headway (sec)                                                      |                                       |    |    |    |           | 3.5  |    | 3.3                        |                       |   |    |    |            | 2.2  |   |   |
| Follow-Up Headway (sec)                                                           |                                       |    |    |    |           | 3.50 |    | 3.33                       |                       |   |    |    |            | 2.26 |   |   |
| <b>Delay, Queue Length, and Level of Service</b>                                  |                                       |    |    |    |           |      |    |                            |                       |   |    |    |            |      |   |   |
| Flow Rate, v (veh/h)                                                              |                                       |    |    |    |           | 63   |    |                            |                       |   |    |    |            | 16   |   |   |
| Capacity, c (veh/h)                                                               |                                       |    |    |    |           | 921  |    |                            |                       |   |    |    |            | 1429 |   |   |
| v/c Ratio                                                                         |                                       |    |    |    |           | 0.07 |    |                            |                       |   |    |    |            | 0.01 |   |   |
| 95% Queue Length, Q <sub>95</sub> (veh)                                           |                                       |    |    |    |           | 0.2  |    |                            |                       |   |    |    |            | 0.0  |   |   |
| Control Delay (s/veh)                                                             |                                       |    |    |    |           | 9.2  |    |                            |                       |   |    |    |            | 7.5  |   |   |
| Level of Service (LOS)                                                            |                                       |    |    |    |           | A    |    |                            |                       |   |    |    |            | A    |   |   |
| Approach Delay (s/veh)                                                            |                                       |    |    |    | 9.2       |      |    |                            |                       |   |    |    | 4.7        |      |   |   |
| Approach LOS                                                                      |                                       |    |    |    | A         |      |    |                            |                       |   |    |    |            |      |   |   |



| HCS7 Two-Way Stop-Control Report                                                                                   |                                       |    |    |    |           |      |      |      |                            |                       |    |    |            |      |    |   |  |
|--------------------------------------------------------------------------------------------------------------------|---------------------------------------|----|----|----|-----------|------|------|------|----------------------------|-----------------------|----|----|------------|------|----|---|--|
| General Information                                                                                                |                                       |    |    |    |           |      |      |      | Site Information           |                       |    |    |            |      |    |   |  |
| Analyst                                                                                                            | DBZ                                   |    |    |    |           |      |      |      | Intersection               | Oak Grove at Entrance |    |    |            |      |    |   |  |
| Agency/Co.                                                                                                         | Diane B Zimmerman Traffic Engineering |    |    |    |           |      |      |      | Jurisdiction               |                       |    |    |            |      |    |   |  |
| Date Performed                                                                                                     | 9/19/2021                             |    |    |    |           |      |      |      | East/West Street           | Oak Grove             |    |    |            |      |    |   |  |
| Analysis Year                                                                                                      | 2027                                  |    |    |    |           |      |      |      | North/South Street         | Oak Grove/Entrance    |    |    |            |      |    |   |  |
| Time Analyzed                                                                                                      | PM Peak Build                         |    |    |    |           |      |      |      | Peak Hour Factor           | 0.92                  |    |    |            |      |    |   |  |
| Intersection Orientation                                                                                           | North-South                           |    |    |    |           |      |      |      | Analysis Time Period (hrs) | 0.25                  |    |    |            |      |    |   |  |
| Project Description                                                                                                | Oak Grove                             |    |    |    |           |      |      |      |                            |                       |    |    |            |      |    |   |  |
| <b>Lanes</b>                                                                                                       |                                       |    |    |    |           |      |      |      |                            |                       |    |    |            |      |    |   |  |
|  <p>Major Street: North-South</p> |                                       |    |    |    |           |      |      |      |                            |                       |    |    |            |      |    |   |  |
| <b>Vehicle Volumes and Adjustments</b>                                                                             |                                       |    |    |    |           |      |      |      |                            |                       |    |    |            |      |    |   |  |
| Approach                                                                                                           | Eastbound                             |    |    |    | Westbound |      |      |      | Northbound                 |                       |    |    | Southbound |      |    |   |  |
| Movement                                                                                                           | U                                     | L  | T  | R  | U         | L    | T    | R    | U                          | L                     | T  | R  | U          | L    | T  | R |  |
| Priority                                                                                                           |                                       | 10 | 11 | 12 |           | 7    | 8    | 9    | 1U                         | 1                     | 2  | 3  | 4U         | 4    | 5  | 6 |  |
| Number of Lanes                                                                                                    |                                       | 0  | 0  | 0  |           | 0    | 1    | 0    | 0                          | 0                     | 1  | 0  | 0          | 0    | 1  | 0 |  |
| Configuration                                                                                                      |                                       |    |    |    |           |      | LR   |      |                            |                       |    | TR |            | LT   |    |   |  |
| Volume (veh/h)                                                                                                     |                                       |    |    |    |           | 101  |      | 16   |                            |                       | 19 | 60 |            | 25   | 32 |   |  |
| Percent Heavy Vehicles (%)                                                                                         |                                       |    |    |    |           | 0    |      | 0    |                            |                       |    |    |            | 4    |    |   |  |
| Proportion Time Blocked                                                                                            |                                       |    |    |    |           |      |      |      |                            |                       |    |    |            |      |    |   |  |
| Percent Grade (%)                                                                                                  |                                       |    |    |    | 0         |      |      |      |                            |                       |    |    |            |      |    |   |  |
| Right Turn Channelized                                                                                             |                                       |    |    |    |           |      |      |      |                            |                       |    |    |            |      |    |   |  |
| Median Type   Storage                                                                                              | Undivided                             |    |    |    |           |      |      |      |                            |                       |    |    |            |      |    |   |  |
| <b>Critical and Follow-up Headways</b>                                                                             |                                       |    |    |    |           |      |      |      |                            |                       |    |    |            |      |    |   |  |
| Base Critical Headway (sec)                                                                                        |                                       |    |    |    |           | 7.1  |      | 6.2  |                            |                       |    |    |            | 4.1  |    |   |  |
| Critical Headway (sec)                                                                                             |                                       |    |    |    |           | 6.40 |      | 6.20 |                            |                       |    |    |            | 4.14 |    |   |  |
| Base Follow-Up Headway (sec)                                                                                       |                                       |    |    |    |           | 3.5  |      | 3.3  |                            |                       |    |    |            | 2.2  |    |   |  |
| Follow-Up Headway (sec)                                                                                            |                                       |    |    |    |           | 3.50 |      | 3.30 |                            |                       |    |    |            | 2.24 |    |   |  |
| <b>Delay, Queue Length, and Level of Service</b>                                                                   |                                       |    |    |    |           |      |      |      |                            |                       |    |    |            |      |    |   |  |
| Flow Rate, v (veh/h)                                                                                               |                                       |    |    |    |           |      | 127  |      |                            |                       |    |    |            | 27   |    |   |  |
| Capacity, c (veh/h)                                                                                                |                                       |    |    |    |           |      | 860  |      |                            |                       |    |    |            | 1498 |    |   |  |
| v/c Ratio                                                                                                          |                                       |    |    |    |           |      | 0.15 |      |                            |                       |    |    |            | 0.02 |    |   |  |
| 95% Queue Length, Q <sub>95</sub> (veh)                                                                            |                                       |    |    |    |           |      | 0.5  |      |                            |                       |    |    |            | 0.1  |    |   |  |
| Control Delay (s/veh)                                                                                              |                                       |    |    |    |           |      | 9.9  |      |                            |                       |    |    |            | 7.4  |    |   |  |
| Level of Service (LOS)                                                                                             |                                       |    |    |    |           |      | A    |      |                            |                       |    |    |            | A    |    |   |  |
| Approach Delay (s/veh)                                                                                             |                                       |    |    |    | 9.9       |      |      |      |                            |                       |    |    | 3.3        |      |    |   |  |
| Approach LOS                                                                                                       |                                       |    |    |    | A         |      |      |      |                            |                       |    |    |            |      |    |   |  |



Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Two-Way Stop-Control Report                                                  |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |
|-----------------------------------------------------------------------------------|---------------------------------------|------|----|---|-----------|---|----|----------------------------|-------------------------|---|---|---|------------|------|----|------|
| General Information                                                               |                                       |      |    |   |           |   |    | Site Information           |                         |   |   |   |            |      |    |      |
| Analyst                                                                           | DBZ                                   |      |    |   |           |   |    | Intersection               | Thixton at Pebble Trace |   |   |   |            |      |    |      |
| Agency/Co.                                                                        | Diane B Zimmerman Traffic Engineering |      |    |   |           |   |    | Jurisdiction               |                         |   |   |   |            |      |    |      |
| Date Performed                                                                    | 9/19/2021                             |      |    |   |           |   |    | East/West Street           | Thixton Lane            |   |   |   |            |      |    |      |
| Analysis Year                                                                     | 2021                                  |      |    |   |           |   |    | North/South Street         | Pebble Trace            |   |   |   |            |      |    |      |
| Time Analyzed                                                                     | AM Peak                               |      |    |   |           |   |    | Peak Hour Factor           | 0.90                    |   |   |   |            |      |    |      |
| Intersection Orientation                                                          | East-West                             |      |    |   |           |   |    | Analysis Time Period (hrs) | 0.25                    |   |   |   |            |      |    |      |
| Project Description                                                               | Oak Grove                             |      |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |
| <b>Lanes</b>                                                                      |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |
|  |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |
| <b>Vehicle Volumes and Adjustments</b>                                            |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |
| Approach                                                                          | Eastbound                             |      |    |   | Westbound |   |    |                            | Northbound              |   |   |   | Southbound |      |    |      |
| Movement                                                                          | U                                     | L    | T  | R | U         | L | T  | R                          | U                       | L | T | R | U          | L    | T  | R    |
| Priority                                                                          | 1U                                    | 1    | 2  | 3 | 4U        | 4 | 5  | 6                          |                         | 7 | 8 | 9 |            | 10   | 11 | 12   |
| Number of Lanes                                                                   | 0                                     | 0    | 1  | 0 | 0         | 0 | 1  | 0                          |                         | 0 | 0 | 0 |            | 0    | 1  | 0    |
| Configuration                                                                     |                                       | LT   |    |   |           |   |    | TR                         |                         |   |   |   |            |      | LR |      |
| Volume (veh/h)                                                                    |                                       | 10   | 74 |   |           |   | 88 | 15                         |                         |   |   |   |            | 35   |    | 26   |
| Percent Heavy Vehicles (%)                                                        |                                       | 0    |    |   |           |   |    |                            |                         |   |   |   |            | 0    |    | 4    |
| Proportion Time Blocked                                                           |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |
| Percent Grade (%)                                                                 |                                       |      |    |   |           |   |    |                            |                         |   |   |   | 0          |      |    |      |
| Right Turn Channelized                                                            |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |
| Median Type   Storage                                                             |                                       |      |    |   | Undivided |   |    |                            |                         |   |   |   |            |      |    |      |
| <b>Critical and Follow-up Headways</b>                                            |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |
| Base Critical Headway (sec)                                                       |                                       | 4.1  |    |   |           |   |    |                            |                         |   |   |   |            | 7.1  |    | 6.2  |
| Critical Headway (sec)                                                            |                                       | 4.10 |    |   |           |   |    |                            |                         |   |   |   |            | 6.40 |    | 6.24 |
| Base Follow-Up Headway (sec)                                                      |                                       | 2.2  |    |   |           |   |    |                            |                         |   |   |   |            | 3.5  |    | 3.3  |
| Follow-Up Headway (sec)                                                           |                                       | 2.20 |    |   |           |   |    |                            |                         |   |   |   |            | 3.50 |    | 3.34 |
| <b>Delay, Queue Length, and Level of Service</b>                                  |                                       |      |    |   |           |   |    |                            |                         |   |   |   |            |      |    |      |
| Flow Rate, v (veh/h)                                                              |                                       | 11   |    |   |           |   |    |                            |                         |   |   |   |            | 68   |    |      |
| Capacity, c (veh/h)                                                               |                                       | 1487 |    |   |           |   |    |                            |                         |   |   |   |            | 839  |    |      |
| v/c Ratio                                                                         |                                       | 0.01 |    |   |           |   |    |                            |                         |   |   |   |            | 0.08 |    |      |
| 95% Queue Length, Q <sub>95</sub> (veh)                                           |                                       | 0.0  |    |   |           |   |    |                            |                         |   |   |   |            | 0.3  |    |      |
| Control Delay (s/veh)                                                             |                                       | 7.4  |    |   |           |   |    |                            |                         |   |   |   |            | 9.7  |    |      |
| Level of Service (LOS)                                                            |                                       | A    |    |   |           |   |    |                            |                         |   |   |   |            | A    |    |      |
| Approach Delay (s/veh)                                                            | 0.9                                   |      |    |   |           |   |    |                            |                         |   |   |   | 9.7        |      |    |      |
| Approach LOS                                                                      |                                       |      |    |   |           |   |    |                            |                         |   |   |   | A          |      |    |      |

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| HCS7 Two-Way Stop-Control Report                           |                                       |      |    |   |           |   |    |                            |            |   |   |                         |            |      |      |      |
|------------------------------------------------------------|---------------------------------------|------|----|---|-----------|---|----|----------------------------|------------|---|---|-------------------------|------------|------|------|------|
| General Information                                        |                                       |      |    |   |           |   |    | Site Information           |            |   |   |                         |            |      |      |      |
| Analyst                                                    | DBZ                                   |      |    |   |           |   |    | Intersection               |            |   |   | Thixton at Pebble Trace |            |      |      |      |
| Agency/Co.                                                 | Diane B Zimmerman Traffic Engineering |      |    |   |           |   |    | Jurisdiction               |            |   |   |                         |            |      |      |      |
| Date Performed                                             | 9/19/2021                             |      |    |   |           |   |    | East/West Street           |            |   |   | Thixton Lane            |            |      |      |      |
| Analysis Year                                              | 2027                                  |      |    |   |           |   |    | North/South Street         |            |   |   | Pebble Trace            |            |      |      |      |
| Time Analyzed                                              | AM Peak No Build                      |      |    |   |           |   |    | Peak Hour Factor           |            |   |   | 0.90                    |            |      |      |      |
| Intersection Orientation                                   | East-West                             |      |    |   |           |   |    | Analysis Time Period (hrs) |            |   |   | 0.25                    |            |      |      |      |
| Project Description                                        | Oak Grove                             |      |    |   |           |   |    |                            |            |   |   |                         |            |      |      |      |
| <b>Lanes</b>                                               |                                       |      |    |   |           |   |    |                            |            |   |   |                         |            |      |      |      |
| <p style="text-align: center;">Major Street: East-West</p> |                                       |      |    |   |           |   |    |                            |            |   |   |                         |            |      |      |      |
| <b>Vehicle Volumes and Adjustments</b>                     |                                       |      |    |   |           |   |    |                            |            |   |   |                         |            |      |      |      |
| Approach                                                   | Eastbound                             |      |    |   | Westbound |   |    |                            | Northbound |   |   |                         | Southbound |      |      |      |
| Movement                                                   | U                                     | L    | T  | R | U         | L | T  | R                          | U          | L | T | R                       | U          | L    | T    | R    |
| Priority                                                   | 1U                                    | 1    | 2  | 3 | 4U        | 4 | 5  | 6                          |            | 7 | 8 | 9                       |            | 10   | 11   | 12   |
| Number of Lanes                                            | 0                                     | 0    | 1  | 0 | 0         | 0 | 1  | 0                          |            | 0 | 0 | 0                       |            | 0    | 1    | 0    |
| Configuration                                              |                                       | LT   |    |   |           |   |    | TR                         |            |   |   |                         |            |      | LR   |      |
| Volume (veh/h)                                             |                                       | 10   | 83 |   |           |   | 99 | 15                         |            |   |   |                         |            | 35   |      | 26   |
| Percent Heavy Vehicles (%)                                 |                                       | 0    |    |   |           |   |    |                            |            |   |   |                         |            | 0    |      | 4    |
| Proportion Time Blocked                                    |                                       |      |    |   |           |   |    |                            |            |   |   |                         |            |      |      |      |
| Percent Grade (%)                                          | 0                                     |      |    |   |           |   |    |                            |            |   |   |                         |            |      |      |      |
| Right Turn Channelized                                     |                                       |      |    |   |           |   |    |                            |            |   |   |                         |            |      |      |      |
| Median Type   Storage                                      | Undivided                             |      |    |   |           |   |    |                            |            |   |   |                         |            |      |      |      |
| <b>Critical and Follow-up Headways</b>                     |                                       |      |    |   |           |   |    |                            |            |   |   |                         |            |      |      |      |
| Base Critical Headway (sec)                                |                                       | 4.1  |    |   |           |   |    |                            |            |   |   |                         |            | 7.1  |      | 6.2  |
| Critical Headway (sec)                                     |                                       | 4.10 |    |   |           |   |    |                            |            |   |   |                         |            | 6.40 |      | 6.24 |
| Base Follow-Up Headway (sec)                               |                                       | 2.2  |    |   |           |   |    |                            |            |   |   |                         |            | 3.5  |      | 3.3  |
| Follow-Up Headway (sec)                                    |                                       | 2.20 |    |   |           |   |    |                            |            |   |   |                         |            | 3.50 |      | 3.34 |
| <b>Delay, Queue Length, and Level of Service</b>           |                                       |      |    |   |           |   |    |                            |            |   |   |                         |            |      |      |      |
| Flow Rate, v (veh/h)                                       |                                       | 11   |    |   |           |   |    |                            |            |   |   |                         |            |      | 68   |      |
| Capacity, c (veh/h)                                        |                                       | 1472 |    |   |           |   |    |                            |            |   |   |                         |            |      | 819  |      |
| v/c Ratio                                                  |                                       | 0.01 |    |   |           |   |    |                            |            |   |   |                         |            |      | 0.08 |      |
| 95% Queue Length, Q <sub>95</sub> (veh)                    |                                       | 0.0  |    |   |           |   |    |                            |            |   |   |                         |            |      | 0.3  |      |
| Control Delay (s/veh)                                      |                                       | 7.5  |    |   |           |   |    |                            |            |   |   |                         |            |      | 9.8  |      |
| Level of Service (LOS)                                     |                                       | A    |    |   |           |   |    |                            |            |   |   |                         |            |      | A    |      |
| Approach Delay (s/veh)                                     | 0.9                                   |      |    |   |           |   |    |                            | 9.8        |   |   |                         |            |      |      |      |
| Approach LOS                                               | A                                     |      |    |   |           |   |    |                            | A          |   |   |                         |            |      |      |      |



Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Two-Way Stop-Control Report                 |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
|--------------------------------------------------|---------------------------------------|------|----|---|-----------|---|-----|----------------------------|-------------------------|---|---|---|------------|------|----|------|
| General Information                              |                                       |      |    |   |           |   |     | Site Information           |                         |   |   |   |            |      |    |      |
| Analyst                                          | DBZ                                   |      |    |   |           |   |     | Intersection               | Thixton at Pebble Trace |   |   |   |            |      |    |      |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |      |    |   |           |   |     | Jurisdiction               |                         |   |   |   |            |      |    |      |
| Date Performed                                   | 9/19/2021                             |      |    |   |           |   |     | East/West Street           | Thixton Lane            |   |   |   |            |      |    |      |
| Analysis Year                                    | 2027                                  |      |    |   |           |   |     | North/South Street         | Pebble Trace            |   |   |   |            |      |    |      |
| Time Analyzed                                    | AM Peak Build                         |      |    |   |           |   |     | Peak Hour Factor           | 0.90                    |   |   |   |            |      |    |      |
| Intersection Orientation                         | East-West                             |      |    |   |           |   |     | Analysis Time Period (hrs) | 0.25                    |   |   |   |            |      |    |      |
| Project Description                              | Oak Grove                             |      |    |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| <b>Lanes</b>                                     |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
|                                                  |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Approach                                         | Eastbound                             |      |    |   | Westbound |   |     |                            | Northbound              |   |   |   | Southbound |      |    |      |
| Movement                                         | U                                     | L    | T  | R | U         | L | T   | R                          | U                       | L | T | R | U          | L    | T  | R    |
| Priority                                         | 1U                                    | 1    | 2  | 3 | 4U        | 4 | 5   | 6                          |                         | 7 | 8 | 9 |            | 10   | 11 | 12   |
| Number of Lanes                                  | 0                                     | 0    | 1  | 0 | 0         | 0 | 1   | 0                          |                         | 0 | 0 | 0 |            | 0    | 1  | 0    |
| Configuration                                    | LT                                    |      |    |   |           |   |     |                            | TR                      |   |   |   | LR         |      |    |      |
| Volume (veh/h)                                   |                                       | 13   | 94 |   |           |   | 133 | 20                         |                         |   |   |   |            | 51   |    | 35   |
| Percent Heavy Vehicles (%)                       |                                       | 0    |    |   |           |   |     |                            |                         |   |   |   |            | 0    |    | 4    |
| Proportion Time Blocked                          |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Percent Grade (%)                                |                                       |      |    |   |           |   |     |                            | 0                       |   |   |   |            |      |    |      |
| Right Turn Channelized                           |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Median Type   Storage                            | Undivided                             |      |    |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| <b>Critical and Follow-up Headways</b>           |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Base Critical Headway (sec)                      |                                       | 4.1  |    |   |           |   |     |                            |                         |   |   |   |            | 7.1  |    | 6.2  |
| Critical Headway (sec)                           |                                       | 4.10 |    |   |           |   |     |                            |                         |   |   |   |            | 6.40 |    | 6.24 |
| Base Follow-Up Headway (sec)                     |                                       | 2.2  |    |   |           |   |     |                            |                         |   |   |   |            | 3.5  |    | 3.3  |
| Follow-Up Headway (sec)                          |                                       | 2.20 |    |   |           |   |     |                            |                         |   |   |   |            | 3.50 |    | 3.34 |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |      |    |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Flow Rate, v (veh/h)                             |                                       | 14   |    |   |           |   |     |                            |                         |   |   |   |            | 96   |    |      |
| Capacity, c (veh/h)                              |                                       | 1420 |    |   |           |   |     |                            |                         |   |   |   |            | 761  |    |      |
| v/c Ratio                                        |                                       | 0.01 |    |   |           |   |     |                            |                         |   |   |   |            | 0.13 |    |      |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       | 0.0  |    |   |           |   |     |                            |                         |   |   |   |            | 0.4  |    |      |
| Control Delay (s/veh)                            |                                       | 7.6  |    |   |           |   |     |                            |                         |   |   |   |            | 10.4 |    |      |
| Level of Service (LOS)                           |                                       | A    |    |   |           |   |     |                            |                         |   |   |   |            | B    |    |      |
| Approach Delay (s/veh)                           | 1.0                                   |      |    |   |           |   |     |                            |                         |   |   |   | 10.4       |      |    |      |
| Approach LOS                                     |                                       |      |    |   |           |   |     |                            |                         |   |   |   | B          |      |    |      |

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| HCS7 Two-Way Stop-Control Report                 |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
|--------------------------------------------------|---------------------------------------|------|-----|---|-----------|---|-----|----------------------------|-------------------------|---|---|---|------------|------|------|------|
| General Information                              |                                       |      |     |   |           |   |     | Site Information           |                         |   |   |   |            |      |      |      |
| Analyst                                          | DBZ                                   |      |     |   |           |   |     | Intersection               | Thixton at Pebble Trace |   |   |   |            |      |      |      |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |      |     |   |           |   |     | Jurisdiction               |                         |   |   |   |            |      |      |      |
| Date Performed                                   | 9/19/2021                             |      |     |   |           |   |     | East/West Street           | Thixton Lane            |   |   |   |            |      |      |      |
| Analysis Year                                    | 2021                                  |      |     |   |           |   |     | North/South Street         | Pebble Trace            |   |   |   |            |      |      |      |
| Time Analyzed                                    | PM Peak                               |      |     |   |           |   |     | Peak Hour Factor           | 0.92                    |   |   |   |            |      |      |      |
| Intersection Orientation                         | East-West                             |      |     |   |           |   |     | Analysis Time Period (hrs) | 0.25                    |   |   |   |            |      |      |      |
| Project Description                              | Oak Grove                             |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| <b>Lanes</b>                                     |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
|                                                  |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| Approach                                         | Eastbound                             |      |     |   | Westbound |   |     |                            | Northbound              |   |   |   | Southbound |      |      |      |
| Movement                                         | U                                     | L    | T   | R | U         | L | T   | R                          | U                       | L | T | R | U          | L    | T    | R    |
| Priority                                         | 1U                                    | 1    | 2   | 3 | 4U        | 4 | 5   | 6                          |                         | 7 | 8 | 9 |            | 10   | 11   | 12   |
| Number of Lanes                                  | 0                                     | 0    | 1   | 0 | 0         | 0 | 1   | 0                          |                         | 0 | 0 | 0 |            | 0    | 1    | 0    |
| Configuration                                    | LT                                    |      |     |   | TR        |   |     |                            |                         |   |   |   | LR         |      |      |      |
| Volume (veh/h)                                   |                                       | 22   | 144 |   |           |   | 114 | 34                         |                         |   |   |   |            | 19   |      | 9    |
| Percent Heavy Vehicles (%)                       |                                       | 5    |     |   |           |   |     |                            |                         |   |   |   |            | 5    |      | 11   |
| Proportion Time Blocked                          |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| Percent Grade (%)                                |                                       |      |     |   |           |   |     |                            |                         |   |   |   | 0          |      |      |      |
| Right Turn Channelized                           |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| Median Type   Storage                            |                                       |      |     |   | Undivided |   |     |                            |                         |   |   |   |            |      |      |      |
| <b>Critical and Follow-up Headways</b>           |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| Base Critical Headway (sec)                      |                                       | 4.1  |     |   |           |   |     |                            |                         |   |   |   |            | 7.1  |      | 6.2  |
| Critical Headway (sec)                           |                                       | 4.15 |     |   |           |   |     |                            |                         |   |   |   |            | 6.45 |      | 6.31 |
| Base Follow-Up Headway (sec)                     |                                       | 2.2  |     |   |           |   |     |                            |                         |   |   |   |            | 3.5  |      | 3.3  |
| Follow-Up Headway (sec)                          |                                       | 2.25 |     |   |           |   |     |                            |                         |   |   |   |            | 3.55 |      | 3.40 |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |      |      |
| Flow Rate, v (veh/h)                             |                                       | 24   |     |   |           |   |     |                            |                         |   |   |   |            |      | 30   |      |
| Capacity, c (veh/h)                              |                                       | 1400 |     |   |           |   |     |                            |                         |   |   |   |            |      | 695  |      |
| v/c Ratio                                        |                                       | 0.02 |     |   |           |   |     |                            |                         |   |   |   |            |      | 0.04 |      |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       | 0.1  |     |   |           |   |     |                            |                         |   |   |   |            |      | 0.1  |      |
| Control Delay (s/veh)                            |                                       | 7.6  |     |   |           |   |     |                            |                         |   |   |   |            |      | 10.4 |      |
| Level of Service (LOS)                           |                                       | A    |     |   |           |   |     |                            |                         |   |   |   |            |      | B    |      |
| Approach Delay (s/veh)                           | 1.1                                   |      |     |   |           |   |     |                            |                         |   |   |   | 10.4       |      |      |      |
| Approach LOS                                     |                                       |      |     |   |           |   |     |                            |                         |   |   |   | B          |      |      |      |



Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Two-Way Stop-Control Report                 |                                       |   |   |   |           |   |   |                            |                         |   |   |   |            |    |    |    |
|--------------------------------------------------|---------------------------------------|---|---|---|-----------|---|---|----------------------------|-------------------------|---|---|---|------------|----|----|----|
| General Information                              |                                       |   |   |   |           |   |   | Site Information           |                         |   |   |   |            |    |    |    |
| Analyst                                          | DBZ                                   |   |   |   |           |   |   | Intersection               | Thixton at Pebble Trace |   |   |   |            |    |    |    |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |   |   |   |           |   |   | Jurisdiction               |                         |   |   |   |            |    |    |    |
| Date Performed                                   | 9/19/2021                             |   |   |   |           |   |   | East/West Street           | Thixton Lane            |   |   |   |            |    |    |    |
| Analysis Year                                    | 2027                                  |   |   |   |           |   |   | North/South Street         | Pebble Trace            |   |   |   |            |    |    |    |
| Time Analyzed                                    | PM Peak No Build                      |   |   |   |           |   |   | Peak Hour Factor           | 0.92                    |   |   |   |            |    |    |    |
| Intersection Orientation                         | East-West                             |   |   |   |           |   |   | Analysis Time Period (hrs) | 0.25                    |   |   |   |            |    |    |    |
| Project Description                              | Oak Grove                             |   |   |   |           |   |   |                            |                         |   |   |   |            |    |    |    |
| <b>Lanes</b>                                     |                                       |   |   |   |           |   |   |                            |                         |   |   |   |            |    |    |    |
|                                                  |                                       |   |   |   |           |   |   |                            |                         |   |   |   |            |    |    |    |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |   |   |   |           |   |   |                            |                         |   |   |   |            |    |    |    |
| Approach                                         | Eastbound                             |   |   |   | Westbound |   |   |                            | Northbound              |   |   |   | Southbound |    |    |    |
| Movement                                         | U                                     | L | T | R | U         | L | T | R                          | U                       | L | T | R | U          | L  | T  | R  |
| Priority                                         | 1U                                    | 1 | 2 | 3 | 4U        | 4 | 5 | 6                          |                         | 7 | 8 | 9 |            | 10 | 11 | 12 |
| Number of Lanes                                  | 0                                     | 0 | 1 | 0 | 0         | 0 | 1 | 0                          |                         | 0 | 0 | 0 |            | 0  | 1  | 0  |
| Configuration                                    | LT                                    |   |   |   |           |   |   |                            | TR                      |   |   |   | LR         |    |    |    |
| Volume (veh/h)                                   | 22                                    |   |   |   | 162       |   |   |                            | 128                     |   |   |   | 34         |    |    |    |
| Percent Heavy Vehicles (%)                       | 5                                     |   |   |   |           |   |   |                            |                         |   |   |   | 5          |    |    |    |
| Proportion Time Blocked                          |                                       |   |   |   |           |   |   |                            |                         |   |   |   |            |    |    |    |
| Percent Grade (%)                                |                                       |   |   |   |           |   |   |                            |                         |   |   |   | 0          |    |    |    |
| Right Turn Channelized                           |                                       |   |   |   |           |   |   |                            |                         |   |   |   |            |    |    |    |
| Median Type   Storage                            | Undivided                             |   |   |   |           |   |   |                            |                         |   |   |   |            |    |    |    |
| <b>Critical and Follow-up Headways</b>           |                                       |   |   |   |           |   |   |                            |                         |   |   |   |            |    |    |    |
| Base Critical Headway (sec)                      | 4.1                                   |   |   |   |           |   |   |                            |                         |   |   |   | 7.1        |    |    |    |
| Critical Headway (sec)                           | 4.15                                  |   |   |   |           |   |   |                            |                         |   |   |   | 6.45       |    |    |    |
| Base Follow-Up Headway (sec)                     | 2.2                                   |   |   |   |           |   |   |                            |                         |   |   |   | 3.5        |    |    |    |
| Follow-Up Headway (sec)                          | 2.25                                  |   |   |   |           |   |   |                            |                         |   |   |   | 3.55       |    |    |    |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |   |   |   |           |   |   |                            |                         |   |   |   |            |    |    |    |
| Flow Rate, v (veh/h)                             | 24                                    |   |   |   |           |   |   |                            |                         |   |   |   | 30         |    |    |    |
| Capacity, c (veh/h)                              | 1382                                  |   |   |   |           |   |   |                            |                         |   |   |   | 668        |    |    |    |
| v/c Ratio                                        | 0.02                                  |   |   |   |           |   |   |                            |                         |   |   |   | 0.05       |    |    |    |
| 95% Queue Length, Q <sub>95</sub> (veh)          | 0.1                                   |   |   |   |           |   |   |                            |                         |   |   |   | 0.1        |    |    |    |
| Control Delay (s/veh)                            | 7.7                                   |   |   |   |           |   |   |                            |                         |   |   |   | 10.6       |    |    |    |
| Level of Service (LOS)                           | A                                     |   |   |   |           |   |   |                            |                         |   |   |   | B          |    |    |    |
| Approach Delay (s/veh)                           | 1.0                                   |   |   |   |           |   |   |                            |                         |   |   |   | 10.6       |    |    |    |
| Approach LOS                                     |                                       |   |   |   |           |   |   |                            |                         |   |   |   | B          |    |    |    |

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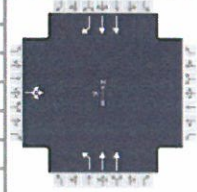


Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Two-Way Stop-Control Report                 |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
|--------------------------------------------------|---------------------------------------|------|-----|---|-----------|---|-----|----------------------------|-------------------------|---|---|---|------------|------|----|------|
| General Information                              |                                       |      |     |   |           |   |     | Site Information           |                         |   |   |   |            |      |    |      |
| Analyst                                          | DBZ                                   |      |     |   |           |   |     | Intersection               | Thixton at Pebble Trace |   |   |   |            |      |    |      |
| Agency/Co.                                       | Diane B Zimmerman Traffic Engineering |      |     |   |           |   |     | Jurisdiction               |                         |   |   |   |            |      |    |      |
| Date Performed                                   | 9/19/2021                             |      |     |   |           |   |     | East/West Street           | Thixton Lane            |   |   |   |            |      |    |      |
| Analysis Year                                    | 2027                                  |      |     |   |           |   |     | North/South Street         | Pebble Trace            |   |   |   |            |      |    |      |
| Time Analyzed                                    | PM Peak Build                         |      |     |   |           |   |     | Peak Hour Factor           | 0.92                    |   |   |   |            |      |    |      |
| Intersection Orientation                         | East-West                             |      |     |   |           |   |     | Analysis Time Period (hrs) | 0.25                    |   |   |   |            |      |    |      |
| Project Description                              | Oak Grove                             |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| <b>Lanes</b>                                     |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
|                                                  |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| <b>Vehicle Volumes and Adjustments</b>           |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Approach                                         | Eastbound                             |      |     |   | Westbound |   |     |                            | Northbound              |   |   |   | Southbound |      |    |      |
| Movement                                         | U                                     | L    | T   | R | U         | L | T   | R                          | U                       | L | T | R | U          | L    | T  | R    |
| Priority                                         | 1U                                    | 1    | 2   | 3 | 4U        | 4 | 5   | 6                          |                         | 7 | 8 | 9 |            | 10   | 11 | 12   |
| Number of Lanes                                  | 0                                     | 0    | 1   | 0 | 0         | 0 | 1   | 0                          |                         | 0 | 0 | 0 |            | 0    | 1  | 0    |
| Configuration                                    | LT                                    |      |     |   | TR        |   |     |                            |                         |   |   |   | LR         |      |    |      |
| Volume (veh/h)                                   |                                       | 33   | 200 |   |           |   | 151 | 52                         |                         |   |   |   |            | 29   |    | 15   |
| Percent Heavy Vehicles (%)                       |                                       | 5    |     |   |           |   |     |                            |                         |   |   |   |            | 5    |    | 11   |
| Proportion Time Blocked                          |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Percent Grade (%)                                |                                       |      |     |   |           |   |     |                            |                         |   |   |   | 0          |      |    |      |
| Right Turn Channelized                           |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Median Type   Storage                            | Undivided                             |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| <b>Critical and Follow-up Headways</b>           |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Base Critical Headway (sec)                      |                                       | 4.1  |     |   |           |   |     |                            |                         |   |   |   |            | 7.1  |    | 6.2  |
| Critical Headway (sec)                           |                                       | 4.15 |     |   |           |   |     |                            |                         |   |   |   |            | 6.45 |    | 6.31 |
| Base Follow-Up Headway (sec)                     |                                       | 2.2  |     |   |           |   |     |                            |                         |   |   |   |            | 3.5  |    | 3.3  |
| Follow-Up Headway (sec)                          |                                       | 2.25 |     |   |           |   |     |                            |                         |   |   |   |            | 3.55 |    | 3.40 |
| <b>Delay, Queue Length, and Level of Service</b> |                                       |      |     |   |           |   |     |                            |                         |   |   |   |            |      |    |      |
| Flow Rate, v (veh/h)                             |                                       | 36   |     |   |           |   |     |                            |                         |   |   |   |            | 48   |    |      |
| Capacity, c (veh/h)                              |                                       | 1331 |     |   |           |   |     |                            |                         |   |   |   |            | 597  |    |      |
| v/c Ratio                                        |                                       | 0.03 |     |   |           |   |     |                            |                         |   |   |   |            | 0.08 |    |      |
| 95% Queue Length, Q <sub>95</sub> (veh)          |                                       | 0.1  |     |   |           |   |     |                            |                         |   |   |   |            | 0.3  |    |      |
| Control Delay (s/veh)                            |                                       | 7.8  |     |   |           |   |     |                            |                         |   |   |   |            | 11.6 |    |      |
| Level of Service (LOS)                           |                                       | A    |     |   |           |   |     |                            |                         |   |   |   |            | B    |    |      |
| Approach Delay (s/veh)                           | 1.3                                   |      |     |   |           |   |     |                            |                         |   |   |   | 11.6       |      |    |      |
| Approach LOS                                     |                                       |      |     |   |           |   |     |                            |                         |   |   |   | B          |      |    |      |



Oak Grove Subdivision  
Traffic Impact Study

| HCS7 Signalized Intersection Results Summary    |       |                                        |     |               |       |                                                                                   |      |                 |      |         |       |                                                                                     |       |       |    |  |
|-------------------------------------------------|-------|----------------------------------------|-----|---------------|-------|-----------------------------------------------------------------------------------|------|-----------------|------|---------|-------|-------------------------------------------------------------------------------------|-------|-------|----|--|
| General Information                             |       |                                        |     |               |       | Intersection Information                                                          |      |                 |      |         |       |  |       |       |    |  |
| Agency                                          |       | Diane B. Zimmerman Traffic Engineering |     |               |       | Duration, h                                                                       |      | 0.250           |      |         |       |                                                                                     |       |       |    |  |
| Analyst                                         |       | DBZ                                    |     | Analysis Date |       | 9/19/2021                                                                         |      | Area Type       |      | Other   |       |                                                                                     |       |       |    |  |
| Jurisdiction                                    |       |                                        |     | Time Period   |       | AM Peak                                                                           |      | PHF             |      | 0.94    |       |                                                                                     |       |       |    |  |
| Urban Street                                    |       | Bardstown Road                         |     | Analysis Year |       | 2021                                                                              |      | Analysis Period |      | 1> 7:00 |       |                                                                                     |       |       |    |  |
| Intersection                                    |       | Thixton                                |     | File Name     |       | Thixton AM 21.xus                                                                 |      |                 |      |         |       |                                                                                     |       |       |    |  |
| Project Description                             |       | Oak Grove                              |     |               |       |                                                                                   |      |                 |      |         |       |                                                                                     |       |       |    |  |
| Demand Information                              |       |                                        |     | EB            |       |                                                                                   | WB   |                 |      | NB      |       |                                                                                     | SB    |       |    |  |
| Approach Movement                               |       |                                        |     | L             | T     | R                                                                                 | L    | T               | R    | L       | T     | R                                                                                   | L     | T     | R  |  |
| Demand ( v ), veh/h                             |       |                                        |     | 97            | 0     | 53                                                                                |      |                 |      | 231     | 1587  |                                                                                     |       | 758   | 56 |  |
| Signal Information                              |       |                                        |     |               |       |  |      |                 |      |         |       |  |       |       |    |  |
| Cycle, s                                        | 120.0 | Reference Phase                        | 2   | Green         | 8.8   | 67.6                                                                              | 23.4 | 0.0             | 0.0  | 0.0     |       |                                                                                     |       |       |    |  |
| Offset, s                                       | 0     | Reference Point                        | End | Yellow        | 3.6   | 5.0                                                                               | 3.6  | 0.0             | 0.0  | 0.0     |       |                                                                                     |       |       |    |  |
| Uncoordinated                                   | No    | Simult. Gap E/W                        | On  | Red           | 3.0   | 2.0                                                                               | 3.0  | 0.0             | 0.0  | 0.0     |       |                                                                                     |       |       |    |  |
| Force Mode                                      | Fixed | Simult. Gap N/S                        | On  |               |       |                                                                                   |      |                 |      |         |       |                                                                                     |       |       |    |  |
| Timer Results                                   |       |                                        |     | EBL           | EBT   | WBL                                                                               | WBT  | NBL             | NBT  | SBL     | SBT   |                                                                                     |       |       |    |  |
| Assigned Phase                                  |       |                                        |     |               | 4     |                                                                                   |      | 5               | 2    |         | 6     |                                                                                     |       |       |    |  |
| Case Number                                     |       |                                        |     |               | 12.0  |                                                                                   |      | 1.0             | 4.0  |         | 7.3   |                                                                                     |       |       |    |  |
| Phase Duration, s                               |       |                                        |     |               | 30.0  |                                                                                   |      | 15.4            | 90.0 |         | 74.6  |                                                                                     |       |       |    |  |
| Change Period, ( Y+R c ), s                     |       |                                        |     |               | 6.6   |                                                                                   |      | 6.6             | 7.0  |         | 7.0   |                                                                                     |       |       |    |  |
| Max Allow Headway ( MAH ), s                    |       |                                        |     |               | 3.2   |                                                                                   |      | 3.0             | 0.0  |         | 0.0   |                                                                                     |       |       |    |  |
| Queue Clearance Time ( g s ), s                 |       |                                        |     |               | 25.4  |                                                                                   |      | 8.7             |      |         |       |                                                                                     |       |       |    |  |
| Green Extension Time ( g e ), s                 |       |                                        |     |               | 0.0   |                                                                                   |      | 0.2             | 0.0  |         | 0.0   |                                                                                     |       |       |    |  |
| Phase Call Probability                          |       |                                        |     |               | 1.00  |                                                                                   |      | 1.00            |      |         |       |                                                                                     |       |       |    |  |
| Max Out Probability                             |       |                                        |     |               | 1.00  |                                                                                   |      | 0.18            |      |         |       |                                                                                     |       |       |    |  |
| Movement Group Results                          |       |                                        |     | EB            |       |                                                                                   | WB   |                 |      | NB      |       |                                                                                     | SB    |       |    |  |
| Approach Movement                               |       |                                        |     | L             | T     | R                                                                                 | L    | T               | R    | L       | T     | R                                                                                   | L     | T     | R  |  |
| Assigned Movement                               |       |                                        |     | 7             | 4     | 14                                                                                |      |                 |      | 5       | 2     |                                                                                     | 6     | 16    |    |  |
| Adjusted Flow Rate ( v ), veh/h                 |       |                                        |     |               | 160   |                                                                                   |      |                 |      | 246     | 1688  |                                                                                     | 806   | 60    |    |  |
| Adjusted Saturation Flow Rate ( s ), veh/h/in   |       |                                        |     |               | 1707  |                                                                                   |      |                 |      | 1781    | 1766  |                                                                                     | 1724  | 1547  |    |  |
| Queue Service Time ( g s ), s                   |       |                                        |     |               | 10.0  |                                                                                   |      |                 |      | 6.7     | 33.9  |                                                                                     | 16.0  | 2.1   |    |  |
| Cycle Queue Clearance Time ( g c ), s           |       |                                        |     |               | 10.0  |                                                                                   |      |                 |      | 6.7     | 33.9  |                                                                                     | 16.0  | 2.1   |    |  |
| Green Ratio ( g/C )                             |       |                                        |     |               | 0.20  |                                                                                   |      |                 |      | 0.65    | 0.69  |                                                                                     | 0.56  | 0.56  |    |  |
| Capacity ( c ), veh/h                           |       |                                        |     |               | 333   |                                                                                   |      |                 |      | 481     | 2444  |                                                                                     | 1941  | 871   |    |  |
| Volume-to-Capacity Ratio ( X )                  |       |                                        |     |               | 0.479 |                                                                                   |      |                 |      | 0.510   | 0.691 |                                                                                     | 0.415 | 0.068 |    |  |
| Back of Queue ( Q ), ft/in ( 95 th percentile)  |       |                                        |     |               | 192.6 |                                                                                   |      |                 |      | 102.7   | 422.7 |                                                                                     | 257   | 32.9  |    |  |
| Back of Queue ( Q ), veh/in ( 95 th percentile) |       |                                        |     |               | 7.6   |                                                                                   |      |                 |      | 4.0     | 16.5  |                                                                                     | 9.8   | 1.3   |    |  |
| Queue Storage Ratio ( RQ ) ( 95 th percentile)  |       |                                        |     |               | 0.00  |                                                                                   |      |                 |      | 0.34    | 0.00  |                                                                                     | 0.00  | 0.00  |    |  |
| Uniform Delay ( d 1 ), s/veh                    |       |                                        |     |               | 42.9  |                                                                                   |      |                 |      | 10.5    | 10.9  |                                                                                     | 15.0  | 11.9  |    |  |
| Incremental Delay ( d 2 ), s/veh                |       |                                        |     |               | 0.4   |                                                                                   |      |                 |      | 0.3     | 1.6   |                                                                                     | 0.7   | 0.2   |    |  |
| Initial Queue Delay ( d 3 ), s/veh              |       |                                        |     |               | 0.0   |                                                                                   |      |                 |      | 0.0     | 0.0   |                                                                                     | 0.0   | 0.0   |    |  |
| Control Delay ( d ), s/veh                      |       |                                        |     |               | 43.3  |                                                                                   |      |                 |      | 10.8    | 12.6  |                                                                                     | 15.6  | 12.1  |    |  |
| Level of Service (LOS)                          |       |                                        |     |               | D     |                                                                                   |      |                 |      | B       | B     |                                                                                     | B     | B     |    |  |
| Approach Delay, s/veh / LOS                     |       |                                        |     | 43.3          | D     |                                                                                   | 0.0  |                 |      | 12.3    | B     |                                                                                     | 15.4  | B     |    |  |
| Intersection Delay, s/veh / LOS                 |       |                                        |     | 14.9          |       |                                                                                   |      |                 | B    |         |       |                                                                                     |       |       |    |  |
| Multimodal Results                              |       |                                        |     | EB            |       |                                                                                   | WB   |                 |      | NB      |       |                                                                                     | SB    |       |    |  |
| Pedestrian LOS Score / LOS                      |       |                                        |     | 2.33          | B     |                                                                                   | 2.32 | B               |      | 1.35    | A     |                                                                                     | 1.67  | B     |    |  |
| Bicycle LOS Score / LOS                         |       |                                        |     | 0.75          | A     |                                                                                   |      |                 |      | 2.08    | B     |                                                                                     | 1.20  | A     |    |  |

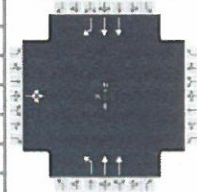
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HCS™ Streets Version 7.9.5

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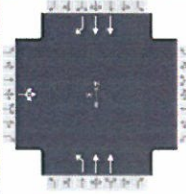
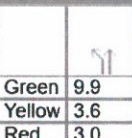
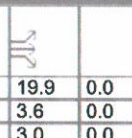
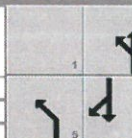
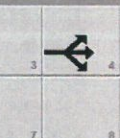
### HCS7 Signalized Intersection Results Summary

| General Information                             |                                        |                 |                      | Intersection Information |                                                                                   |                                                                                   |      |  |     |       |       |                                                                                     |                                                                                     |                                                                                     |    |                                                                                     |   |      |  |
|-------------------------------------------------|----------------------------------------|-----------------|----------------------|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-----|-------|-------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----|-------------------------------------------------------------------------------------|---|------|--|
| Agency                                          | Diane B. Zimmerman Traffic Engineering |                 |                      | Duration, h              | 0.250                                                                             |                                                                                   |      |                                                                                     |     |       |       |                                                                                     |                                                                                     |                                                                                     |    |                                                                                     |   |      |  |
| Analyst                                         | DBZ                                    | Analysis Date   | 9/19/2021            |                          | Area Type                                                                         | Other                                                                             |      |                                                                                     |     |       |       |                                                                                     |                                                                                     |                                                                                     |    |                                                                                     |   |      |  |
| Jurisdiction                                    |                                        | Time Period     | AM Peak              |                          | PHF                                                                               | 0.94                                                                              |      |                                                                                     |     |       |       |                                                                                     |                                                                                     |                                                                                     |    |                                                                                     |   |      |  |
| Urban Street                                    | Bardstown Road                         | Analysis Year   | 2027 No Build        |                          | Analysis Period                                                                   | 1> 7:00                                                                           |      |                                                                                     |     |       |       |                                                                                     |                                                                                     |                                                                                     |    |                                                                                     |   |      |  |
| Intersection                                    | Thixton                                | File Name       | Thixton AM 27 NB.xus |                          |                                                                                   |                                                                                   |      |                                                                                     |     |       |       |                                                                                     |                                                                                     |                                                                                     |    |                                                                                     |   |      |  |
| Project Description                             | Oak Grove                              |                 |                      |                          |                                                                                   |                                                                                   |      |                                                                                     |     |       |       |                                                                                     |                                                                                     |                                                                                     |    |                                                                                     |   |      |  |
| Demand Information                              |                                        |                 |                      | EB                       |                                                                                   |                                                                                   | WB   |                                                                                     |     | NB    |       |                                                                                     | SB                                                                                  |                                                                                     |    |                                                                                     |   |      |  |
| Approach Movement                               |                                        |                 |                      | L                        | T                                                                                 | R                                                                                 | L    | T                                                                                   | R   | L     | T     | R                                                                                   | L                                                                                   | T                                                                                   | R  |                                                                                     |   |      |  |
| Demand ( v ), veh/h                             |                                        |                 |                      | 109                      | 0                                                                                 | 60                                                                                |      |                                                                                     |     | 260   | 1685  |                                                                                     |                                                                                     | 805                                                                                 | 63 |                                                                                     |   |      |  |
| Signal Information                              |                                        |                 |                      |                          |                                                                                   |  |      |                                                                                     |     |       |       |  |                                                                                     |  |    |                                                                                     |   |      |  |
| Cycle, s                                        | 120.0                                  | Reference Phase | 2                    |                          |  |  |      |                                                                                     |     |       |       | 1                                                                                   |  | 2                                                                                   | 3  |  | 4 |      |  |
| Offset, s                                       | 0                                      | Reference Point | End                  | Green                    | 9.8                                                                               | 66.6                                                                              | 23.4 | 0.0                                                                                 | 0.0 | 0.0   | 0.0   |                                                                                     |  |  |    |                                                                                     |   |      |  |
| Uncoordinated                                   | No                                     | Simult. Gap E/W | On                   | Yellow                   | 3.6                                                                               | 5.0                                                                               | 3.6  | 0.0                                                                                 | 0.0 | 0.0   | 0.0   |                                                                                     |                                                                                     |                                                                                     |    |                                                                                     |   |      |  |
| Force Mode                                      | Fixed                                  | Simult. Gap N/S | On                   | Red                      | 3.0                                                                               | 2.0                                                                               | 3.0  | 0.0                                                                                 | 0.0 | 0.0   | 0.0   |                                                                                     |                                                                                     |                                                                                     |    |                                                                                     |   |      |  |
| Timer Results                                   |                                        |                 |                      | EBL                      |                                                                                   | EBT                                                                               |      | WBL                                                                                 |     | WBT   |       | NBL                                                                                 |                                                                                     | NBT                                                                                 |    | SBL                                                                                 |   | SBT  |  |
| Assigned Phase                                  |                                        |                 |                      |                          |                                                                                   | 4                                                                                 |      |                                                                                     |     |       |       | 5                                                                                   |                                                                                     | 2                                                                                   |    |                                                                                     |   | 6    |  |
| Case Number                                     |                                        |                 |                      |                          |                                                                                   | 12.0                                                                              |      |                                                                                     |     |       |       | 1.0                                                                                 |                                                                                     | 4.0                                                                                 |    |                                                                                     |   | 7.3  |  |
| Phase Duration, s                               |                                        |                 |                      |                          |                                                                                   | 30.0                                                                              |      |                                                                                     |     |       |       | 16.4                                                                                |                                                                                     | 90.0                                                                                |    |                                                                                     |   | 73.6 |  |
| Change Period, ( Y+R c ), s                     |                                        |                 |                      |                          |                                                                                   | 6.6                                                                               |      |                                                                                     |     |       |       | 6.6                                                                                 |                                                                                     | 7.0                                                                                 |    |                                                                                     |   | 7.0  |  |
| Max Allow Headway ( MAH ), s                    |                                        |                 |                      |                          |                                                                                   | 3.2                                                                               |      |                                                                                     |     |       |       | 3.0                                                                                 |                                                                                     | 0.0                                                                                 |    |                                                                                     |   | 0.0  |  |
| Queue Clearance Time ( g s ), s                 |                                        |                 |                      |                          |                                                                                   | 25.4                                                                              |      |                                                                                     |     |       |       | 9.6                                                                                 |                                                                                     |                                                                                     |    |                                                                                     |   |      |  |
| Green Extension Time ( g e ), s                 |                                        |                 |                      |                          |                                                                                   | 0.0                                                                               |      |                                                                                     |     |       |       | 0.2                                                                                 |                                                                                     | 0.0                                                                                 |    |                                                                                     |   | 0.0  |  |
| Phase Call Probability                          |                                        |                 |                      |                          |                                                                                   | 1.00                                                                              |      |                                                                                     |     |       |       | 1.00                                                                                |                                                                                     |                                                                                     |    |                                                                                     |   |      |  |
| Max Out Probability                             |                                        |                 |                      |                          |                                                                                   | 1.00                                                                              |      |                                                                                     |     |       |       | 0.49                                                                                |                                                                                     |                                                                                     |    |                                                                                     |   |      |  |
| Movement Group Results                          |                                        |                 |                      | EB                       |                                                                                   |                                                                                   | WB   |                                                                                     |     | NB    |       |                                                                                     | SB                                                                                  |                                                                                     |    |                                                                                     |   |      |  |
| Approach Movement                               |                                        |                 |                      | L                        | T                                                                                 | R                                                                                 | L    | T                                                                                   | R   | L     | T     | R                                                                                   | L                                                                                   | T                                                                                   | R  |                                                                                     |   |      |  |
| Assigned Movement                               |                                        |                 |                      | 7                        | 4                                                                                 | 14                                                                                |      |                                                                                     |     | 5     | 2     |                                                                                     |                                                                                     | 6                                                                                   | 16 |                                                                                     |   |      |  |
| Adjusted Flow Rate ( v ), veh/h                 |                                        |                 |                      | 180                      |                                                                                   |                                                                                   |      |                                                                                     |     | 277   | 1793  |                                                                                     | 856                                                                                 | 67                                                                                  |    |                                                                                     |   |      |  |
| Adjusted Saturation Flow Rate ( s ), veh/h/ln   |                                        |                 |                      | 1706                     |                                                                                   |                                                                                   |      |                                                                                     |     | 1781  | 1766  |                                                                                     | 1724                                                                                | 1547                                                                                |    |                                                                                     |   |      |  |
| Queue Service Time ( g s ), s                   |                                        |                 |                      | 11.4                     |                                                                                   |                                                                                   |      |                                                                                     |     | 7.6   | 38.1  |                                                                                     | 17.7                                                                                | 2.4                                                                                 |    |                                                                                     |   |      |  |
| Cycle Queue Clearance Time ( g c ), s           |                                        |                 |                      | 11.4                     |                                                                                   |                                                                                   |      |                                                                                     |     | 7.6   | 38.1  |                                                                                     | 17.7                                                                                | 2.4                                                                                 |    |                                                                                     |   |      |  |
| Green Ratio ( g/C )                             |                                        |                 |                      | 0.20                     |                                                                                   |                                                                                   |      |                                                                                     |     | 0.65  | 0.69  |                                                                                     | 0.55                                                                                | 0.55                                                                                |    |                                                                                     |   |      |  |
| Capacity ( c ), veh/h                           |                                        |                 |                      | 333                      |                                                                                   |                                                                                   |      |                                                                                     |     | 469   | 2444  |                                                                                     | 1913                                                                                | 858                                                                                 |    |                                                                                     |   |      |  |
| Volume-to-Capacity Ratio ( X )                  |                                        |                 |                      | 0.540                    |                                                                                   |                                                                                   |      |                                                                                     |     | 0.590 | 0.734 |                                                                                     | 0.448                                                                               | 0.078                                                                               |    |                                                                                     |   |      |  |
| Back of Queue ( Q ), ft/ln ( 95 th percentile)  |                                        |                 |                      | 215.3                    |                                                                                   |                                                                                   |      |                                                                                     |     | 120.4 | 468.5 |                                                                                     | 279.6                                                                               | 38.3                                                                                |    |                                                                                     |   |      |  |
| Back of Queue ( Q ), veh/ln ( 95 th percentile) |                                        |                 |                      | 8.5                      |                                                                                   |                                                                                   |      |                                                                                     |     | 4.7   | 18.3  |                                                                                     | 10.7                                                                                | 1.5                                                                                 |    |                                                                                     |   |      |  |
| Queue Storage Ratio ( RQ ) ( 95 th percentile)  |                                        |                 |                      | 0.00                     |                                                                                   |                                                                                   |      |                                                                                     |     | 0.40  | 0.00  |                                                                                     | 0.00                                                                                | 0.00                                                                                |    |                                                                                     |   |      |  |
| Uniform Delay ( d 1 ), s/veh                    |                                        |                 |                      | 43.5                     |                                                                                   |                                                                                   |      |                                                                                     |     | 11.4  | 11.6  |                                                                                     | 15.8                                                                                | 12.4                                                                                |    |                                                                                     |   |      |  |
| Incremental Delay ( d 2 ), s/veh                |                                        |                 |                      | 1.0                      |                                                                                   |                                                                                   |      |                                                                                     |     | 0.7   | 2.0   |                                                                                     | 0.8                                                                                 | 0.2                                                                                 |    |                                                                                     |   |      |  |
| Initial Queue Delay ( d 3 ), s/veh              |                                        |                 |                      | 0.0                      |                                                                                   |                                                                                   |      |                                                                                     |     | 0.0   | 0.0   |                                                                                     | 0.0                                                                                 | 0.0                                                                                 |    |                                                                                     |   |      |  |
| Control Delay ( d ), s/veh                      |                                        |                 |                      | 44.4                     |                                                                                   |                                                                                   |      |                                                                                     |     | 12.1  | 13.6  |                                                                                     | 16.6                                                                                | 12.6                                                                                |    |                                                                                     |   |      |  |
| Level of Service (LOS)                          |                                        |                 |                      | D                        |                                                                                   |                                                                                   |      |                                                                                     |     | B     | B     |                                                                                     | B                                                                                   | B                                                                                   |    |                                                                                     |   |      |  |
| Approach Delay, s/veh / LOS                     |                                        |                 |                      | 44.4                     |                                                                                   | D                                                                                 | 0.0  |                                                                                     |     |       | 13.4  |                                                                                     | B                                                                                   | 16.3                                                                                |    | B                                                                                   |   |      |  |
| Intersection Delay, s/veh / LOS                 |                                        |                 |                      | 16.0                     |                                                                                   |                                                                                   |      |                                                                                     |     | B     |       |                                                                                     |                                                                                     |                                                                                     |    |                                                                                     |   |      |  |
| Multimodal Results                              |                                        |                 |                      | EB                       |                                                                                   |                                                                                   | WB   |                                                                                     |     | NB    |       |                                                                                     | SB                                                                                  |                                                                                     |    |                                                                                     |   |      |  |
| Pedestrian LOS Score / LOS                      |                                        |                 |                      | 2.33                     |                                                                                   | B                                                                                 | 2.32 |                                                                                     | B   | 1.35  |       | A                                                                                   | 1.67                                                                                |                                                                                     | B  |                                                                                     |   |      |  |
| Bicycle LOS Score / LOS                         |                                        |                 |                      | 0.78                     |                                                                                   | A                                                                                 |      |                                                                                     |     | 2.19  |       | B                                                                                   | 1.25                                                                                |                                                                                     | A  |                                                                                     |   |      |  |



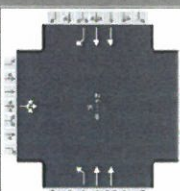
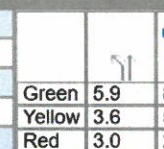
Oak Grove Subdivision  
Traffic Impact Study

### HCS7 Signalized Intersection Results Summary

| General Information                             |                                        |                 |                     |  | Intersection Information                                                                                                                                                                                                                                                                                                                    |             |       |      |     |  |       |       |      |       |       |    |     |  |      |  |
|-------------------------------------------------|----------------------------------------|-----------------|---------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------|------|-----|-------------------------------------------------------------------------------------|-------|-------|------|-------|-------|----|-----|--|------|--|
| Agency                                          | Diane B. Zimmerman Traffic Engineering |                 |                     |  |                                                                                                                                                                                                                                                                                                                                             | Duration, h | 0.250 |      |     |                                                                                     |       |       |      |       |       |    |     |  |      |  |
| Analyst                                         | DBZ                                    | Analysis Date   | 9/19/2021           |  | Area Type                                                                                                                                                                                                                                                                                                                                   | Other       |       |      |     |                                                                                     |       |       |      |       |       |    |     |  |      |  |
| Jurisdiction                                    |                                        | Time Period     | AM Peak             |  | PHF                                                                                                                                                                                                                                                                                                                                         | 0.94        |       |      |     |                                                                                     |       |       |      |       |       |    |     |  |      |  |
| Urban Street                                    | Bardstown Road                         | Analysis Year   | 2027 Build          |  | Analysis Period                                                                                                                                                                                                                                                                                                                             | 1> 7:00     |       |      |     |                                                                                     |       |       |      |       |       |    |     |  |      |  |
| Intersection                                    | Thixton                                | File Name       | Thixton AM 27 B.xus |  |                                                                                                                                                                                                                                                                                                                                             |             |       |      |     |                                                                                     |       |       |      |       |       |    |     |  |      |  |
| Project Description                             | Oak Grove                              |                 |                     |  |                                                                                                                                                                                                                                                                                                                                             |             |       |      |     |                                                                                     |       |       |      |       |       |    |     |  |      |  |
| Demand Information                              |                                        |                 |                     |  | EB                                                                                                                                                                                                                                                                                                                                          |             |       | WB   |     |                                                                                     | NB    |       |      | SB    |       |    |     |  |      |  |
| Approach Movement                               |                                        |                 |                     |  | L                                                                                                                                                                                                                                                                                                                                           | T           | R     | L    | T   | R                                                                                   | L     | T     | R    | L     | T     | R  |     |  |      |  |
| Demand ( v ), veh/h                             |                                        |                 |                     |  | 156                                                                                                                                                                                                                                                                                                                                         | 0           | 85    |      |     |                                                                                     | 279   | 1685  |      |       | 805   | 68 |     |  |      |  |
| Signal Information                              |                                        |                 |                     |  |     |             |       |      |     |                                                                                     |       |       |      |       |       |    |     |  |      |  |
| Cycle, s                                        | 120.0                                  | Reference Phase | 2                   |  |                                                                                                                                                                                                                                                                                                                                             |             |       |      |     |                                                                                     |       |       |      |       |       |    |     |  |      |  |
| Offset, s                                       | 0                                      | Reference Point | End                 |  |                                                                                                                                                                                                                                                                                                                                             |             |       |      |     |                                                                                     |       |       |      |       |       |    |     |  |      |  |
| Uncoordinated                                   | No                                     | Simult. Gap E/W | On                  |  |                                                                                                                                                                                                                                                                                                                                             |             |       |      |     |                                                                                     |       |       |      |       |       |    |     |  |      |  |
| Force Mode                                      | Fixed                                  | Simult. Gap N/S | On                  |  |                                                                                                                                                                                                                                                                                                                                             |             |       |      |     |                                                                                     |       |       |      |       |       |    |     |  |      |  |
| Green                                           |                                        |                 |                     |  | 9.9                                                                                                                                                                                                                                                                                                                                         | 70.0        | 19.9  | 0.0  | 0.0 | 0.0                                                                                 |       |       |      |       |       |    |     |  |      |  |
| Yellow                                          |                                        |                 |                     |  | 3.6                                                                                                                                                                                                                                                                                                                                         | 5.0         | 3.6   | 0.0  | 0.0 | 0.0                                                                                 |       |       |      |       |       |    |     |  |      |  |
| Red                                             |                                        |                 |                     |  | 3.0                                                                                                                                                                                                                                                                                                                                         | 2.0         | 3.0   | 0.0  | 0.0 | 0.0                                                                                 |       |       |      |       |       |    |     |  |      |  |
| Timer Results                                   |                                        |                 |                     |  | EBL                                                                                                                                                                                                                                                                                                                                         |             | EBT   |      | WBL |                                                                                     | WBT   |       | NBL  |       | NBT   |    | SBL |  | SBT  |  |
| Assigned Phase                                  |                                        |                 |                     |  |                                                                                                                                                                                                                                                                                                                                             |             | 4     |      |     |                                                                                     |       |       | 5    |       | 2     |    |     |  | 6    |  |
| Case Number                                     |                                        |                 |                     |  |                                                                                                                                                                                                                                                                                                                                             |             | 12.0  |      |     |                                                                                     |       |       | 1.0  |       | 4.0   |    |     |  | 7.3  |  |
| Phase Duration, s                               |                                        |                 |                     |  |                                                                                                                                                                                                                                                                                                                                             |             | 26.5  |      |     |                                                                                     |       |       | 16.5 |       | 93.5  |    |     |  | 77.0 |  |
| Change Period, ( Y+R c ), s                     |                                        |                 |                     |  |                                                                                                                                                                                                                                                                                                                                             |             | 6.6   |      |     |                                                                                     |       |       | 6.6  |       | 7.0   |    |     |  | 7.0  |  |
| Max Allow Headway ( MAH ), s                    |                                        |                 |                     |  |                                                                                                                                                                                                                                                                                                                                             |             | 3.2   |      |     |                                                                                     |       |       | 3.0  |       | 0.0   |    |     |  | 0.0  |  |
| Queue Clearance Time ( g s ), s                 |                                        |                 |                     |  |                                                                                                                                                                                                                                                                                                                                             |             | 19.7  |      |     |                                                                                     |       |       | 9.6  |       |       |    |     |  |      |  |
| Green Extension Time ( g e ), s                 |                                        |                 |                     |  |                                                                                                                                                                                                                                                                                                                                             |             | 0.2   |      |     |                                                                                     |       |       | 0.3  |       | 0.0   |    |     |  | 0.0  |  |
| Phase Call Probability                          |                                        |                 |                     |  |                                                                                                                                                                                                                                                                                                                                             |             | 1.00  |      |     |                                                                                     |       |       | 1.00 |       |       |    |     |  |      |  |
| Max Out Probability                             |                                        |                 |                     |  |                                                                                                                                                                                                                                                                                                                                             |             | 0.66  |      |     |                                                                                     |       |       | 0.02 |       |       |    |     |  |      |  |
| Movement Group Results                          |                                        |                 |                     |  | EB                                                                                                                                                                                                                                                                                                                                          |             |       | WB   |     |                                                                                     | NB    |       |      | SB    |       |    |     |  |      |  |
| Approach Movement                               |                                        |                 |                     |  | L                                                                                                                                                                                                                                                                                                                                           | T           | R     | L    | T   | R                                                                                   | L     | T     | R    | L     | T     | R  |     |  |      |  |
| Assigned Movement                               |                                        |                 |                     |  | 7                                                                                                                                                                                                                                                                                                                                           | 4           | 14    |      |     |                                                                                     | 5     | 2     |      |       | 6     | 16 |     |  |      |  |
| Adjusted Flow Rate ( v ), veh/h                 |                                        |                 |                     |  | 256                                                                                                                                                                                                                                                                                                                                         |             |       |      |     |                                                                                     | 297   | 1793  |      | 856   | 72    |    |     |  |      |  |
| Adjusted Saturation Flow Rate ( s ), veh/h/ln   |                                        |                 |                     |  | 1707                                                                                                                                                                                                                                                                                                                                        |             |       |      |     |                                                                                     | 1781  | 1766  |      | 1724  | 1547  |    |     |  |      |  |
| Queue Service Time ( g s ), s                   |                                        |                 |                     |  | 17.7                                                                                                                                                                                                                                                                                                                                        |             |       |      |     |                                                                                     | 7.6   | 34.5  |      | 16.5  | 2.5   |    |     |  |      |  |
| Cycle Queue Clearance Time ( g c ), s           |                                        |                 |                     |  | 17.7                                                                                                                                                                                                                                                                                                                                        |             |       |      |     |                                                                                     | 7.6   | 34.5  |      | 16.5  | 2.5   |    |     |  |      |  |
| Green Ratio ( g/C )                             |                                        |                 |                     |  | 0.17                                                                                                                                                                                                                                                                                                                                        |             |       |      |     |                                                                                     | 0.68  | 0.72  |      | 0.58  | 0.58  |    |     |  |      |  |
| Capacity ( c ), veh/h                           |                                        |                 |                     |  | 283                                                                                                                                                                                                                                                                                                                                         |             |       |      |     |                                                                                     | 495   | 2547  |      | 2011  | 902   |    |     |  |      |  |
| Volume-to-Capacity Ratio ( X )                  |                                        |                 |                     |  | 0.907                                                                                                                                                                                                                                                                                                                                       |             |       |      |     |                                                                                     | 0.600 | 0.704 |      | 0.426 | 0.080 |    |     |  |      |  |
| Back of Queue ( Q ), ft/ln ( 95 th percentile)  |                                        |                 |                     |  | 362.2                                                                                                                                                                                                                                                                                                                                       |             |       |      |     |                                                                                     | 112.8 | 408.7 |      | 260.4 | 38    |    |     |  |      |  |
| Back of Queue ( Q ), veh/ln ( 95 th percentile) |                                        |                 |                     |  | 14.3                                                                                                                                                                                                                                                                                                                                        |             |       |      |     |                                                                                     | 4.4   | 16.0  |      | 9.9   | 1.5   |    |     |  |      |  |
| Queue Storage Ratio ( RQ ) ( 95 th percentile)  |                                        |                 |                     |  | 0.00                                                                                                                                                                                                                                                                                                                                        |             |       |      |     |                                                                                     | 0.38  | 0.00  |      | 0.00  | 0.00  |    |     |  |      |  |
| Uniform Delay ( d ), s/veh                      |                                        |                 |                     |  | 49.1                                                                                                                                                                                                                                                                                                                                        |             |       |      |     |                                                                                     | 9.9   | 9.5   |      | 13.9  | 10.9  |    |     |  |      |  |
| Incremental Delay ( d 2 ), s/veh                |                                        |                 |                     |  | 23.0                                                                                                                                                                                                                                                                                                                                        |             |       |      |     |                                                                                     | 0.4   | 1.7   |      | 0.7   | 0.2   |    |     |  |      |  |
| Initial Queue Delay ( d 3 ), s/veh              |                                        |                 |                     |  | 0.0                                                                                                                                                                                                                                                                                                                                         |             |       |      |     |                                                                                     | 0.0   | 0.0   |      | 0.0   | 0.0   |    |     |  |      |  |
| Control Delay ( d ), s/veh                      |                                        |                 |                     |  | 72.2                                                                                                                                                                                                                                                                                                                                        |             |       |      |     |                                                                                     | 10.3  | 11.1  |      | 14.5  | 11.1  |    |     |  |      |  |
| Level of Service (LOS)                          |                                        |                 |                     |  | E                                                                                                                                                                                                                                                                                                                                           |             |       |      |     |                                                                                     | B     | B     |      | B     | B     |    |     |  |      |  |
| Approach Delay, s/veh / LOS                     |                                        |                 |                     |  | 72.2                                                                                                                                                                                                                                                                                                                                        | E           |       | 0.0  |     |                                                                                     | 11.0  | B     |      | 14.3  | B     |    |     |  |      |  |
| Intersection Delay, s/veh / LOS                 |                                        |                 |                     |  | 16.7                                                                                                                                                                                                                                                                                                                                        |             |       |      |     |                                                                                     | B     |       |      |       |       |    |     |  |      |  |
| Multimodal Results                              |                                        |                 |                     |  | EB                                                                                                                                                                                                                                                                                                                                          |             |       | WB   |     |                                                                                     | NB    |       |      | SB    |       |    |     |  |      |  |
| Pedestrian LOS Score / LOS                      |                                        |                 |                     |  | 2.33                                                                                                                                                                                                                                                                                                                                        | B           |       | 2.32 | B   |                                                                                     | 1.34  | A     |      | 1.67  | B     |    |     |  |      |  |
| Bicycle LOS Score / LOS                         |                                        |                 |                     |  | 0.91                                                                                                                                                                                                                                                                                                                                        | A           |       |      |     |                                                                                     | 2.21  | B     |      | 1.25  | A     |    |     |  |      |  |



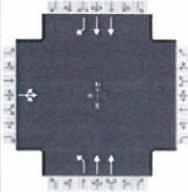
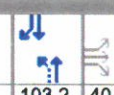
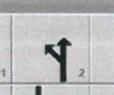
### HCS7 Signalized Intersection Results Summary

| General Information                             |       |                                        |      |                                                                                   |     | Intersection Information |        |                 |   |             |      |  |             |       |     |     |  |      |  |
|-------------------------------------------------|-------|----------------------------------------|------|-----------------------------------------------------------------------------------|-----|--------------------------|--------|-----------------|---|-------------|------|-------------------------------------------------------------------------------------|-------------|-------|-----|-----|--|------|--|
| Agency                                          |       | Diane B. Zimmerman Traffic Engineering |      |                                                                                   |     | Duration, h              |        | 0.250           |   |             |      |                                                                                     |             |       |     |     |  |      |  |
| Analyst                                         |       | DBZ                                    |      | Analysis Date                                                                     |     | 9/19/2021                |        | Area Type       |   | Other       |      |                                                                                     |             |       |     |     |  |      |  |
| Jurisdiction                                    |       |                                        |      | Time Period                                                                       |     | PM Peak                  |        | PHF             |   | 0.98        |      |                                                                                     |             |       |     |     |  |      |  |
| Urban Street                                    |       | Bardstown Road                         |      | Analysis Year                                                                     |     | 2021                     |        | Analysis Period |   | 1> 4:45     |      |                                                                                     |             |       |     |     |  |      |  |
| Intersection                                    |       | Thixton                                |      | File Name                                                                         |     | Thixton PM 21.xus        |        |                 |   |             |      |                                                                                     |             |       |     |     |  |      |  |
| Project Description                             |       | Oak Grove                              |      |                                                                                   |     |                          |        |                 |   |             |      |                                                                                     |             |       |     |     |  |      |  |
| Demand Information                              |       |                                        |      | EB                                                                                |     |                          | WB     |                 |   | NB          |      |                                                                                     | SB          |       |     |     |  |      |  |
| Approach Movement                               |       |                                        |      | L                                                                                 | T   | R                        | L      | T               | R | L           | T    | R                                                                                   | L           | T     | R   |     |  |      |  |
| Demand ( v ), veh/h                             |       |                                        |      | 106                                                                               | 0   | 211                      |        |                 |   | 97          | 1035 |                                                                                     |             | 1841  | 137 |     |  |      |  |
| Signal Information                              |       |                                        |      |  |     |                          |        |                 |   |             |      |                                                                                     |             |       |     |     |  |      |  |
| Cycle, s                                        | 140.0 | Reference Phase                        | 2    |                                                                                   |     |                          |        |                 |   |             |      |                                                                                     |             |       |     |     |  |      |  |
| Offset, s                                       | 0     | Reference Point                        | End  |                                                                                   |     |                          |        |                 |   |             |      |                                                                                     |             |       |     |     |  |      |  |
| Uncoordinated                                   | No    | Simult. Gap E/W                        | On   |                                                                                   |     |                          |        |                 |   |             |      |                                                                                     |             |       |     |     |  |      |  |
| Force Mode                                      | Fixed | Simult. Gap N/S                        | On   |                                                                                   |     |                          |        |                 |   |             |      |                                                                                     |             |       |     |     |  |      |  |
| Green                                           | 5.9   | 80.5                                   | 33.4 | 0.0                                                                               | 0.0 | 0.0                      |        |                 |   |             |      |                                                                                     |             |       |     |     |  |      |  |
| Yellow                                          | 3.6   | 5.0                                    | 3.6  | 0.0                                                                               | 0.0 | 0.0                      |        |                 |   |             |      |                                                                                     |             |       |     |     |  |      |  |
| Red                                             | 3.0   | 2.0                                    | 3.0  | 0.0                                                                               | 0.0 | 0.0                      |        |                 |   |             |      |                                                                                     |             |       |     |     |  |      |  |
| Timer Results                                   |       |                                        |      | EBL                                                                               |     | EBT                      |        | WBL             |   | WBT         |      | NBL                                                                                 |             | NBT   |     | SBL |  | SBT  |  |
| Assigned Phase                                  |       |                                        |      |                                                                                   |     | 4                        |        |                 |   |             |      | 5                                                                                   |             | 2     |     |     |  | 6    |  |
| Case Number                                     |       |                                        |      |                                                                                   |     | 12.0                     |        |                 |   |             |      | 1.0                                                                                 |             | 4.0   |     |     |  | 7.3  |  |
| Phase Duration, s                               |       |                                        |      |                                                                                   |     | 40.0                     |        |                 |   |             |      | 12.5                                                                                |             | 100.0 |     |     |  | 87.5 |  |
| Change Period, ( Y+R c ), s                     |       |                                        |      |                                                                                   |     | 6.6                      |        |                 |   |             |      | 6.6                                                                                 |             | 7.0   |     |     |  | 7.0  |  |
| Max Allow Headway ( MAH ), s                    |       |                                        |      |                                                                                   |     | 3.3                      |        |                 |   |             |      | 3.0                                                                                 |             | 0.0   |     |     |  | 0.0  |  |
| Queue Clearance Time ( g s ), s                 |       |                                        |      |                                                                                   |     | 35.4                     |        |                 |   |             |      | 5.0                                                                                 |             |       |     |     |  |      |  |
| Green Extension Time ( g e ), s                 |       |                                        |      |                                                                                   |     | 0.0                      |        |                 |   |             |      | 0.1                                                                                 |             | 0.0   |     |     |  | 0.0  |  |
| Phase Call Probability                          |       |                                        |      |                                                                                   |     | 1.00                     |        |                 |   |             |      | 0.98                                                                                |             |       |     |     |  |      |  |
| Max Out Probability                             |       |                                        |      |                                                                                   |     | 1.00                     |        |                 |   |             |      | 0.00                                                                                |             |       |     |     |  |      |  |
| Movement Group Results                          |       |                                        |      | EB                                                                                |     |                          | WB     |                 |   | NB          |      |                                                                                     | SB          |       |     |     |  |      |  |
| Approach Movement                               |       |                                        |      | L                                                                                 | T   | R                        | L      | T               | R | L           | T    | R                                                                                   | L           | T     | R   |     |  |      |  |
| Assigned Movement                               |       |                                        |      | 7                                                                                 | 4   | 14                       |        |                 |   | 5           | 2    |                                                                                     |             | 6     | 16  |     |  |      |  |
| Adjusted Flow Rate ( v ), veh/h                 |       |                                        |      | 323                                                                               |     |                          |        |                 |   | 99 1056     |      |                                                                                     | 1879 140    |       |     |     |  |      |  |
| Adjusted Saturation Flow Rate ( s ), veh/h/ln   |       |                                        |      | 1620                                                                              |     |                          |        |                 |   | 1795 1781   |      |                                                                                     | 1795 1572   |       |     |     |  |      |  |
| Queue Service Time ( g s ), s                   |       |                                        |      | 26.6                                                                              |     |                          |        |                 |   | 3.0 19.8    |      |                                                                                     | 65.3 5.8    |       |     |     |  |      |  |
| Cycle Queue Clearance Time ( g c ), s           |       |                                        |      | 26.6                                                                              |     |                          |        |                 |   | 3.0 19.8    |      |                                                                                     | 65.3 5.8    |       |     |     |  |      |  |
| Green Ratio ( g/C )                             |       |                                        |      | 0.24                                                                              |     |                          |        |                 |   | 0.63 0.66   |      |                                                                                     | 0.58 0.58   |       |     |     |  |      |  |
| Capacity ( c ), veh/h                           |       |                                        |      | 386                                                                               |     |                          |        |                 |   | 153 2366    |      |                                                                                     | 2065 904    |       |     |     |  |      |  |
| Volume-to-Capacity Ratio ( X )                  |       |                                        |      | 0.837                                                                             |     |                          |        |                 |   | 0.646 0.446 |      |                                                                                     | 0.910 0.155 |       |     |     |  |      |  |
| Back of Queue ( Q ), ft/ln ( 95 th percentile)  |       |                                        |      | 463.5                                                                             |     |                          |        |                 |   | 89.3 293.1  |      |                                                                                     | 901.9 94    |       |     |     |  |      |  |
| Back of Queue ( Q ), veh/ln ( 95 th percentile) |       |                                        |      | 18.0                                                                              |     |                          |        |                 |   | 3.5 11.5    |      |                                                                                     | 35.8 3.7    |       |     |     |  |      |  |
| Queue Storage Ratio ( RQ ) ( 95 th percentile)  |       |                                        |      | 0.00                                                                              |     |                          |        |                 |   | 0.30 0.00   |      |                                                                                     | 0.00 0.00   |       |     |     |  |      |  |
| Uniform Delay ( d 1 ), s/veh                    |       |                                        |      | 50.7                                                                              |     |                          |        |                 |   | 32.3 11.2   |      |                                                                                     | 26.5 13.9   |       |     |     |  |      |  |
| Incremental Delay ( d 2 ), s/veh                |       |                                        |      | 14.1                                                                              |     |                          |        |                 |   | 1.7 0.6     |      |                                                                                     | 7.4 0.4     |       |     |     |  |      |  |
| Initial Queue Delay ( d 3 ), s/veh              |       |                                        |      | 0.0                                                                               |     |                          |        |                 |   | 0.0 0.0     |      |                                                                                     | 0.0 0.0     |       |     |     |  |      |  |
| Control Delay ( d ), s/veh                      |       |                                        |      | 64.8                                                                              |     |                          |        |                 |   | 34.0 11.8   |      |                                                                                     | 33.9 14.2   |       |     |     |  |      |  |
| Level of Service (LOS)                          |       |                                        |      | E                                                                                 |     |                          |        |                 |   | C B         |      |                                                                                     | C B         |       |     |     |  |      |  |
| Approach Delay, s/veh / LOS                     |       |                                        |      | 64.8 E                                                                            |     |                          | 0.0    |                 |   | 13.7 B      |      |                                                                                     | 32.6 C      |       |     |     |  |      |  |
| Intersection Delay, s/veh / LOS                 |       |                                        |      | 29.3                                                                              |     |                          |        |                 |   | C           |      |                                                                                     |             |       |     |     |  |      |  |
| Multimodal Results                              |       |                                        |      | EB                                                                                |     |                          | WB     |                 |   | NB          |      |                                                                                     | SB          |       |     |     |  |      |  |
| Pedestrian LOS Score / LOS                      |       |                                        |      | 2.33 B                                                                            |     |                          | 2.33 B |                 |   | 1.36 A      |      |                                                                                     | 1.67 B      |       |     |     |  |      |  |
| Bicycle LOS Score / LOS                         |       |                                        |      | 1.02 A                                                                            |     |                          |        |                 |   | 1.44 A      |      |                                                                                     | 2.15 B      |       |     |     |  |      |  |



Oak Grove Subdivision  
Traffic Impact Study

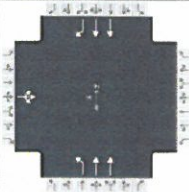
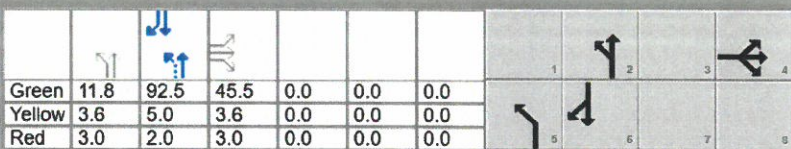
### HCS7 Signalized Intersection Results Summary

| General Information                             |                                        |                 |                      | Intersection Information |                 |                                                                                   |       |      |       |  |       |                                                                                     |      |      |       |
|-------------------------------------------------|----------------------------------------|-----------------|----------------------|--------------------------|-----------------|-----------------------------------------------------------------------------------|-------|------|-------|-------------------------------------------------------------------------------------|-------|-------------------------------------------------------------------------------------|------|------|-------|
| Agency                                          | Diane B. Zimmerman Traffic Engineering |                 |                      |                          |                 | Duration, h                                                                       | 0.250 |      |       |                                                                                     |       |                                                                                     |      |      |       |
| Analyst                                         | DBZ                                    | Analysis Date   | 9/19/2021            |                          | Area Type       | Other                                                                             |       |      |       |                                                                                     |       |                                                                                     |      |      |       |
| Jurisdiction                                    |                                        | Time Period     | PM Peak              |                          | PHF             | 0.98                                                                              |       |      |       |                                                                                     |       |                                                                                     |      |      |       |
| Urban Street                                    | Bardstown Road                         | Analysis Year   | 2027 No Build        |                          | Analysis Period | 1> 4:45                                                                           |       |      |       |                                                                                     |       |                                                                                     |      |      |       |
| Intersection                                    | Thixton                                | File Name       | Thixton PM 27 NB.xus |                          |                 |                                                                                   |       |      |       |                                                                                     |       |                                                                                     |      |      |       |
| Project Description                             | Oak Grove                              |                 |                      |                          |                 |                                                                                   |       |      |       |                                                                                     |       |                                                                                     |      |      |       |
| Demand Information                              |                                        |                 |                      | EB                       |                 |                                                                                   | WB    |      |       | NB                                                                                  |       |                                                                                     | SB   |      |       |
| Approach Movement                               |                                        |                 |                      | L                        | T               | R                                                                                 | L     | T    | R     | L                                                                                   | T     | R                                                                                   | L    | T    | R     |
| Demand ( v ), veh/h                             |                                        |                 |                      | 119                      | 0               | 238                                                                               |       |      |       | 109                                                                                 | 1099  |                                                                                     |      | 1954 | 154   |
| Signal Information                              |                                        |                 |                      |                          |                 |  |       |      |       |                                                                                     |       |  |      |      |       |
| Cycle, s                                        | 170.0                                  | Reference Phase | 2                    | Green                    | 6.2             | 103.2                                                                             | 40.4  | 0.0  | 0.0   | 0.0                                                                                 | 0.0   | 1                                                                                   | 2    | 3    | 4     |
| Offset, s                                       | 0                                      | Reference Point | End                  | Yellow                   | 3.6             | 5.0                                                                               | 3.6   | 0.0  | 0.0   | 0.0                                                                                 | 0.0   | 5                                                                                   | 6    | 7    | 8     |
| Uncoordinated                                   | No                                     | Simult. Gap E/W | On                   | Red                      | 3.0             | 2.0                                                                               | 3.0   | 0.0  | 0.0   | 0.0                                                                                 | 0.0   |                                                                                     |      |      |       |
| Force Mode                                      | Fixed                                  | Simult. Gap N/S | On                   |                          |                 |                                                                                   |       |      |       |                                                                                     |       |                                                                                     |      |      |       |
| Timer Results                                   |                                        |                 |                      | EBL                      | EBT             | WBL                                                                               | WBT   | NBL  | NBT   | SBL                                                                                 | SBT   |                                                                                     |      |      |       |
| Assigned Phase                                  |                                        |                 |                      |                          | 4               |                                                                                   |       | 5    | 2     |                                                                                     | 6     |                                                                                     |      |      |       |
| Case Number                                     |                                        |                 |                      |                          | 12.0            |                                                                                   |       | 1.0  | 4.0   |                                                                                     | 7.3   |                                                                                     |      |      |       |
| Phase Duration, s                               |                                        |                 |                      |                          | 47.0            |                                                                                   |       | 12.8 | 123.0 |                                                                                     | 110.2 |                                                                                     |      |      |       |
| Change Period, ( Y+R c ), s                     |                                        |                 |                      |                          | 6.6             |                                                                                   |       | 6.6  | 7.0   |                                                                                     | 7.0   |                                                                                     |      |      |       |
| Max Allow Headway ( MAH ), s                    |                                        |                 |                      |                          | 3.3             |                                                                                   |       | 3.0  | 0.0   |                                                                                     | 0.0   |                                                                                     |      |      |       |
| Queue Clearance Time ( g s ), s                 |                                        |                 |                      |                          | 39.6            |                                                                                   |       | 6.0  |       |                                                                                     |       |                                                                                     |      |      |       |
| Green Extension Time ( g e ), s                 |                                        |                 |                      |                          | 0.8             |                                                                                   |       | 0.2  | 0.0   |                                                                                     | 0.0   |                                                                                     |      |      |       |
| Phase Call Probability                          |                                        |                 |                      |                          | 1.00            |                                                                                   |       | 0.99 |       |                                                                                     |       |                                                                                     |      |      |       |
| Max Out Probability                             |                                        |                 |                      |                          | 0.00            |                                                                                   |       | 0.00 |       |                                                                                     |       |                                                                                     |      |      |       |
| Movement Group Results                          |                                        |                 |                      | EB                       |                 |                                                                                   | WB    |      |       | NB                                                                                  |       |                                                                                     | SB   |      |       |
| Approach Movement                               |                                        |                 |                      | L                        | T               | R                                                                                 | L     | T    | R     | L                                                                                   | T     | R                                                                                   | L    | T    | R     |
| Assigned Movement                               |                                        |                 |                      | 7                        | 4               | 14                                                                                |       |      |       | 5                                                                                   | 2     |                                                                                     | 6    |      | 16    |
| Adjusted Flow Rate ( v ), veh/h                 |                                        |                 |                      | 364                      |                 |                                                                                   |       |      |       | 111                                                                                 | 1121  | 1994                                                                                |      |      | 157   |
| Adjusted Saturation Flow Rate ( s ), veh/h/ln   |                                        |                 |                      | 1619                     |                 |                                                                                   |       |      |       | 1795                                                                                | 1781  | 1795                                                                                |      |      | 1572  |
| Queue Service Time ( g s ), s                   |                                        |                 |                      | 37.6                     |                 |                                                                                   |       |      |       | 4.0                                                                                 | 24.8  | 83.5                                                                                |      |      | 7.4   |
| Cycle Queue Clearance Time ( g c ), s           |                                        |                 |                      | 37.6                     |                 |                                                                                   |       |      |       | 4.0                                                                                 | 24.8  | 83.5                                                                                |      |      | 7.4   |
| Green Ratio ( g/C )                             |                                        |                 |                      | 0.24                     |                 |                                                                                   |       |      |       | 0.66                                                                                | 0.68  | 0.61                                                                                |      |      | 0.61  |
| Capacity ( c ), veh/h                           |                                        |                 |                      | 385                      |                 |                                                                                   |       |      |       | 133                                                                                 | 2430  | 2178                                                                                |      |      | 954   |
| Volume-to-Capacity Ratio ( X )                  |                                        |                 |                      | 0.946                    |                 |                                                                                   |       |      |       | 0.836                                                                               | 0.462 | 0.915                                                                               |      |      | 0.165 |
| Back of Queue ( Q ), ft/ln ( 95 th percentile)  |                                        |                 |                      | 582.9                    |                 |                                                                                   |       |      |       | 136.9                                                                               | 367.1 | 1139                                                                                |      |      | 123.6 |
| Back of Queue ( Q ), veh/ln ( 95 th percentile) |                                        |                 |                      | 22.6                     |                 |                                                                                   |       |      |       | 5.4                                                                                 | 14.5  | 45.2                                                                                |      |      | 4.8   |
| Queue Storage Ratio ( RQ ) ( 95 th percentile)  |                                        |                 |                      | 0.00                     |                 |                                                                                   |       |      |       | 0.46                                                                                | 0.00  | 0.00                                                                                |      |      | 0.00  |
| Uniform Delay ( d + ), s/veh                    |                                        |                 |                      | 63.7                     |                 |                                                                                   |       |      |       | 41.9                                                                                | 12.5  | 29.6                                                                                |      |      | 14.6  |
| Incremental Delay ( d 2 ), s/veh                |                                        |                 |                      | 5.4                      |                 |                                                                                   |       |      |       | 5.2                                                                                 | 0.6   | 7.5                                                                                 |      |      | 0.4   |
| Initial Queue Delay ( d 3 ), s/veh              |                                        |                 |                      | 0.0                      |                 |                                                                                   |       |      |       | 0.0                                                                                 | 0.0   | 0.0                                                                                 |      |      | 0.0   |
| Control Delay ( d ), s/veh                      |                                        |                 |                      | 69.1                     |                 |                                                                                   |       |      |       | 47.1                                                                                | 13.2  | 37.0                                                                                |      |      | 15.0  |
| Level of Service (LOS)                          |                                        |                 |                      | E                        |                 |                                                                                   |       |      |       | D                                                                                   | B     | D                                                                                   |      |      | B     |
| Approach Delay, s/veh / LOS                     |                                        |                 |                      | 69.1                     |                 | E                                                                                 | 0.0   |      | 16.2  |                                                                                     | B     | 35.4                                                                                |      | D    |       |
| Intersection Delay, s/veh / LOS                 |                                        |                 |                      | 32.4                     |                 |                                                                                   |       |      | C     |                                                                                     |       |                                                                                     |      |      |       |
| Multimodal Results                              |                                        |                 |                      | EB                       |                 |                                                                                   | WB    |      |       | NB                                                                                  |       |                                                                                     | SB   |      |       |
| Pedestrian LOS Score / LOS                      |                                        |                 |                      | 2.34                     |                 | B                                                                                 | 2.34  |      | B     | 1.37                                                                                |       | A                                                                                   | 1.68 |      | B     |
| Bicycle LOS Score / LOS                         |                                        |                 |                      | 1.09                     |                 | A                                                                                 |       |      | 1.50  |                                                                                     | B     | 2.26                                                                                |      | B    |       |



Oak Grove Subdivision  
Traffic Impact Study

### HCS7 Signalized Intersection Results Summary

| General Information                             |                                        |                 |               |                     |      | Intersection Information                                                           |         |      |     |      |       |  |       |              |    |      |     |      |      |     |     |     |
|-------------------------------------------------|----------------------------------------|-----------------|---------------|---------------------|------|------------------------------------------------------------------------------------|---------|------|-----|------|-------|-------------------------------------------------------------------------------------|-------|--------------|----|------|-----|------|------|-----|-----|-----|
| Agency                                          | Diane B. Zimmerman Traffic Engineering |                 |               |                     |      | Duration, h                                                                        | 0.250   |      |     |      |       |                                                                                     |       |              |    |      |     |      |      |     |     |     |
| Analyst                                         | DBZ                                    |                 | Analysis Date | 9/19/2021           |      | Area Type                                                                          | Other   |      |     |      |       |                                                                                     |       |              |    |      |     |      |      |     |     |     |
| Jurisdiction                                    |                                        |                 | Time Period   | PM Peak             |      | PHF                                                                                | 0.98    |      |     |      |       |                                                                                     |       |              |    |      |     |      |      |     |     |     |
| Urban Street                                    | Bardstown Road                         |                 | Analysis Year | 2027 Build          |      | Analysis Period                                                                    | 1> 4:45 |      |     |      |       |                                                                                     |       |              |    |      |     |      |      |     |     |     |
| Intersection                                    | Thixton                                |                 | File Name     | Thixton PM 27 B.xus |      |                                                                                    |         |      |     |      |       |                                                                                     |       |              |    |      |     |      |      |     |     |     |
| Project Description                             |                                        |                 |               |                     |      | Oak Grove                                                                          |         |      |     |      |       |                                                                                     |       |              |    |      |     |      |      |     |     |     |
| Demand Information                              |                                        |                 |               |                     |      | EB                                                                                 |         |      | WB  |      |       | NB                                                                                  |       |              | SB |      |     |      |      |     |     |     |
| Approach Movement                               |                                        |                 |               |                     |      | L                                                                                  | T       | R    | L   | T    | R     | L                                                                                   | T     | R            | L  | T    | R   |      |      |     |     |     |
| Demand ( v ), veh/h                             |                                        |                 |               |                     |      | 135                                                                                | 0       | 269  |     |      |       | 143                                                                                 | 1099  |              |    | 1954 | 201 |      |      |     |     |     |
| Signal Information                              |                                        |                 |               |                     |      |  |         |      |     |      |       |                                                                                     |       |              |    |      |     |      |      |     |     |     |
| Cycle, s                                        | 170.0                                  | Reference Phase | 2             |                     |      |                                                                                    |         |      |     |      |       |                                                                                     |       |              |    |      |     |      |      |     |     |     |
| Offset, s                                       | 0                                      | Reference Point | End           |                     |      |                                                                                    |         |      |     |      |       |                                                                                     |       |              |    |      |     |      |      |     |     |     |
| Uncoordinated                                   | No                                     | Simult. Gap E/W | On            | Green               | 11.8 |                                                                                    |         |      |     |      |       |                                                                                     |       |              |    |      |     | 92.5 | 45.5 | 0.0 | 0.0 | 0.0 |
| Force Mode                                      | Fixed                                  | Simult. Gap N/S | On            | Yellow              | 3.6  |                                                                                    |         |      |     |      |       |                                                                                     |       |              |    |      |     | 5.0  | 3.6  | 0.0 | 0.0 | 0.0 |
|                                                 |                                        |                 |               | Red                 | 3.0  | 2.0                                                                                | 3.0     | 0.0  | 0.0 | 0.0  |       |                                                                                     |       |              |    |      |     |      |      |     |     |     |
| Timer Results                                   |                                        |                 |               |                     |      | EBL                                                                                | EBT     | WBL  | WBT | NBL  | NBT   | SBL                                                                                 | SBT   |              |    |      |     |      |      |     |     |     |
| Assigned Phase                                  |                                        |                 |               |                     |      |                                                                                    | 4       |      |     | 5    | 2     |                                                                                     | 6     |              |    |      |     |      |      |     |     |     |
| Case Number                                     |                                        |                 |               |                     |      |                                                                                    | 12.0    |      |     | 1.0  | 4.0   |                                                                                     | 7.3   |              |    |      |     |      |      |     |     |     |
| Phase Duration, s                               |                                        |                 |               |                     |      |                                                                                    | 52.1    |      |     | 18.4 | 117.9 |                                                                                     | 99.5  |              |    |      |     |      |      |     |     |     |
| Change Period, ( Y+R c ), s                     |                                        |                 |               |                     |      |                                                                                    | 6.6     |      |     | 6.6  | 7.0   |                                                                                     | 7.0   |              |    |      |     |      |      |     |     |     |
| Max Allow Headway ( MAH ), s                    |                                        |                 |               |                     |      |                                                                                    | 3.3     |      |     | 3.0  | 0.0   |                                                                                     | 0.0   |              |    |      |     |      |      |     |     |     |
| Queue Clearance Time ( g s ), s                 |                                        |                 |               |                     |      |                                                                                    | 44.5    |      |     | 11.6 |       |                                                                                     |       |              |    |      |     |      |      |     |     |     |
| Green Extension Time ( g e ), s                 |                                        |                 |               |                     |      |                                                                                    | 0.9     |      |     | 0.2  | 0.0   |                                                                                     | 0.0   |              |    |      |     |      |      |     |     |     |
| Phase Call Probability                          |                                        |                 |               |                     |      |                                                                                    | 1.00    |      |     | 1.00 |       |                                                                                     |       |              |    |      |     |      |      |     |     |     |
| Max Out Probability                             |                                        |                 |               |                     |      |                                                                                    | 0.00    |      |     | 0.00 |       |                                                                                     |       |              |    |      |     |      |      |     |     |     |
| Movement Group Results                          |                                        |                 |               |                     |      | EB                                                                                 |         |      | WB  |      |       | NB                                                                                  |       |              | SB |      |     |      |      |     |     |     |
| Approach Movement                               |                                        |                 |               |                     |      | L                                                                                  | T       | R    | L   | T    | R     | L                                                                                   | T     | R            | L  | T    | R   |      |      |     |     |     |
| Assigned Movement                               |                                        |                 |               |                     |      | 7                                                                                  | 4       | 14   |     |      |       | 5                                                                                   | 2     |              | 6  | 16   |     |      |      |     |     |     |
| Adjusted Flow Rate ( v ), veh/h                 |                                        |                 |               |                     |      | 412                                                                                |         |      |     |      |       | 146                                                                                 | 1121  | 1994 205     |    |      |     |      |      |     |     |     |
| Adjusted Saturation Flow Rate ( s ), veh/h/ln   |                                        |                 |               |                     |      | 1620                                                                               |         |      |     |      |       | 1795                                                                                | 1781  | 1795 1572    |    |      |     |      |      |     |     |     |
| Queue Service Time ( g s ), s                   |                                        |                 |               |                     |      | 42.5                                                                               |         |      |     |      |       | 9.6                                                                                 | 27.1  | 92.5 11.6    |    |      |     |      |      |     |     |     |
| Cycle Queue Clearance Time ( g c ), s           |                                        |                 |               |                     |      | 42.5                                                                               |         |      |     |      |       | 9.6                                                                                 | 27.1  | 92.5 11.6    |    |      |     |      |      |     |     |     |
| Green Ratio ( g/C )                             |                                        |                 |               |                     |      | 0.27                                                                               |         |      |     |      |       | 0.63                                                                                | 0.65  | 0.54 0.54    |    |      |     |      |      |     |     |     |
| Capacity ( c ), veh/h                           |                                        |                 |               |                     |      | 433                                                                                |         |      |     |      |       | 167                                                                                 | 2324  | 1953 856     |    |      |     |      |      |     |     |     |
| Volume-to-Capacity Ratio ( X )                  |                                        |                 |               |                     |      | 0.952                                                                              |         |      |     |      |       | 0.872                                                                               | 0.483 | 1.021 0.240  |    |      |     |      |      |     |     |     |
| Back of Queue ( Q ), ft/ln ( 95 th percentile)  |                                        |                 |               |                     |      | 645.9                                                                              |         |      |     |      |       | 267.5                                                                               | 404.1 | 1438.6 198.7 |    |      |     |      |      |     |     |     |
| Back of Queue ( Q ), veh/ln ( 95 th percentile) |                                        |                 |               |                     |      | 25.0                                                                               |         |      |     |      |       | 10.6                                                                                | 15.9  | 57.1 7.8     |    |      |     |      |      |     |     |     |
| Queue Storage Ratio ( RQ ) ( 95 th percentile)  |                                        |                 |               |                     |      | 0.00                                                                               |         |      |     |      |       | 0.89                                                                                | 0.00  | 0.00 0.00    |    |      |     |      |      |     |     |     |
| Uniform Delay ( d 1 ), s/veh                    |                                        |                 |               |                     |      | 61.2                                                                               |         |      |     |      |       | 58.2                                                                                | 15.0  | 38.8 20.3    |    |      |     |      |      |     |     |     |
| Incremental Delay ( d 2 ), s/veh                |                                        |                 |               |                     |      | 5.4                                                                                |         |      |     |      |       | 5.4                                                                                 | 0.7   | 25.8 0.7     |    |      |     |      |      |     |     |     |
| Initial Queue Delay ( d 3 ), s/veh              |                                        |                 |               |                     |      | 0.0                                                                                |         |      |     |      |       | 0.0                                                                                 | 0.0   | 0.0 0.0      |    |      |     |      |      |     |     |     |
| Control Delay ( d ), s/veh                      |                                        |                 |               |                     |      | 66.6                                                                               |         |      |     |      |       | 63.5                                                                                | 15.7  | 64.6 21.0    |    |      |     |      |      |     |     |     |
| Level of Service (LOS)                          |                                        |                 |               |                     |      | E                                                                                  |         |      |     |      |       | E                                                                                   | B     | F C          |    |      |     |      |      |     |     |     |
| Approach Delay, s/veh / LOS                     |                                        |                 |               |                     |      | 66.6                                                                               | E       | 0.0  |     |      | 21.2  | C                                                                                   | 60.5  | E            |    |      |     |      |      |     |     |     |
| Intersection Delay, s/veh / LOS                 |                                        |                 |               |                     |      | 48.3                                                                               |         |      |     |      | D     |                                                                                     |       |              |    |      |     |      |      |     |     |     |
| Multimodal Results                              |                                        |                 |               |                     |      | EB                                                                                 |         |      | WB  |      |       | NB                                                                                  |       |              | SB |      |     |      |      |     |     |     |
| Pedestrian LOS Score / LOS                      |                                        |                 |               |                     |      | 2.34                                                                               | B       | 2.34 | B   | 1.37 | A     | 1.69                                                                                | B     |              |    |      |     |      |      |     |     |     |
| Bicycle LOS Score / LOS                         |                                        |                 |               |                     |      | 1.17                                                                               | A       |      |     | 1.53 | B     | 2.30                                                                                | B     |              |    |      |     |      |      |     |     |     |