

# final report

October 10, 2017

## Trip Generation and Distribution

*Delcour Multi-Family  
5209 Elzie Road  
Louisville, KY*

Prepared for

**Louisville Metro Planning Commission  
Kentucky Transportation Cabinet**

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## INTRODUCTION

The development plan for the Delcour Multi-family on Elzie Road in Louisville, KY shows an apartment community with 192 units. **Figure 1** displays a map of the site. Access to the development will be from Elzie Road. The purpose of this study is to determine the trip generation and distribution for the site. For this study, the impact area was defined to be the intersections of Dixie Highway at Johnsonstown Road, Dixie Highway at Elzie Road, and Johnsonstown Road at Moonglow Avenue.



**Figure 1. Site Map**

## EXISTING CONDITIONS

Dixie Highway (US 31W) is a state maintained road with an estimated 2017 ADT of 30,000 vehicles per day between Johnsonstown Road and West Pages Road, as provided by a Metro Public Works count (2015). The road has four eleven-foot lanes, a two-way left turn lane, and paved eleven-foot shoulders. The speed limit is 45 mph. There are no sidewalks. The intersection with Johnsonstown Road is controlled with a traffic signal. There are dedicated left and right turn lanes on all approaches. Dixie Highway is served by TARC.

Elzie Road is a Metro maintained road. No existing count data is available. The pavement is approximately 32-foot wide. There is a sidewalk on the north side from Dixie Highway to the west property line.

Peak hour traffic volumes for the intersection was collected April 14, 2015. **Figure 2** illustrates the a.m. and p.m. peak hour traffic volumes.

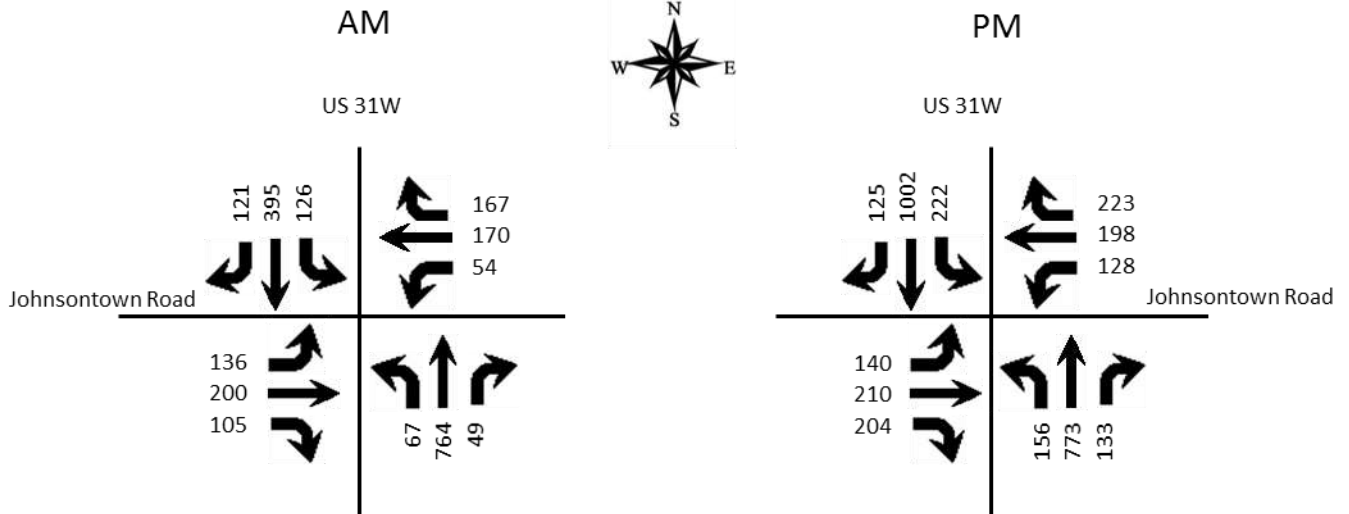


Figure 2. 2015 Peak Hour Volumes

### 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 “Multi-family (220)” was reviewed and determined to be the best match. The trip generation results are listed in **Table 1**. Using the trip generation equation yields 89 a.m. peak hour trips and 106 p.m. peak hour trips. The trips were assigned to the highway network. **Figure 3** shows the trips distribution percentages. **Figure 4** shows the trips generated by this development and distributed throughout the road network during the peak hours.

Table 1. Peak Hour Trips Generated by Site

Land Use	A.M. Peak Hour			P.M. Peak Hour		
	Trips	In	Out	Trips	In	Out
Multi-family (192 units)	89	20	69	106	67	39



Figure 3. Trip Distribution Percentages

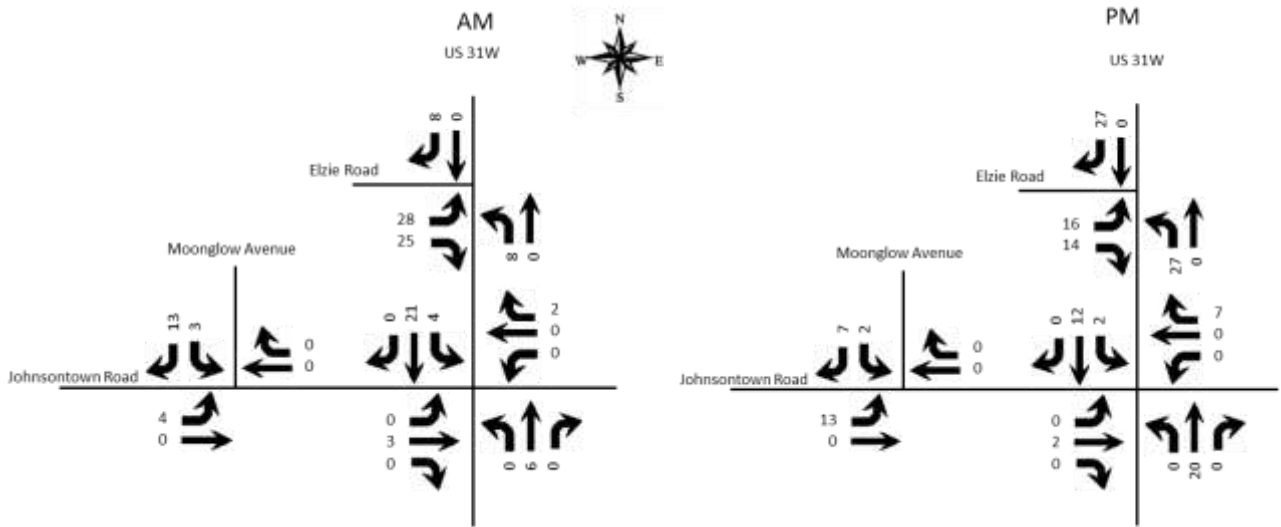


Figure 4. Peak Hour Trips Generated by Site

## **APPENDIX**

Traffic Counts  
**Metro Louisville**  
**Traffic Engineering**

File Name : Dixie Hwy & Stonestreet Rd  
 Site Code :  
 Start Date : 4/14/2015  
 Page No : 1

Groups Printed- cars - trucks - pedal bikes

Start Time	Dixie Hwy From North				Stonestreet Rd From East				Dixie Hwy From South				Johnsontown Rd From West				Int.	Total
	Left	Thru	Right	U-Turns	Left	Thru	Right	U-Turns	Left	Thru	Right	U-Turns	Left	Thru	Right	U-Turns		
07:00 AM	27	85	13	0	8	33	45	0	13	214	13	0	26	43	22	0	542	
07:15 AM	33	114	35	0	12	43	40	0	13	211	8	0	23	40	26	0	598	
07:30 AM	41	96	37	0	13	46	36	0	24	167	15	0	50	62	30	0	617	
07:45 AM	25	100	36	0	21	48	46	0	17	172	13	0	37	55	27	0	597	
<b>Total</b>	<b>126</b>	<b>395</b>	<b>121</b>	<b>0</b>	<b>54</b>	<b>170</b>	<b>167</b>	<b>0</b>	<b>67</b>	<b>764</b>	<b>49</b>	<b>0</b>	<b>136</b>	<b>200</b>	<b>105</b>	<b>0</b>	<b>2354</b>	
08:00 AM	32	84	32	0	10	21	37	0	9	152	17	0	30	26	20	0	470	
08:15 AM	35	109	27	0	20	31	42	0	13	170	26	0	27	30	22	0	552	
08:30 AM	40	122	26	0	14	47	42	0	22	204	10	0	25	50	37	0	639	
08:45 AM	48	135	20	0	15	27	53	0	18	179	16	0	27	48	42	0	628	
<b>Total</b>	<b>155</b>	<b>450</b>	<b>105</b>	<b>0</b>	<b>59</b>	<b>126</b>	<b>174</b>	<b>0</b>	<b>62</b>	<b>705</b>	<b>69</b>	<b>0</b>	<b>109</b>	<b>154</b>	<b>121</b>	<b>0</b>	<b>2289</b>	
09:00 AM	27	124	16	0	11	14	47	0	13	175	11	0	26	38	30	0	532	
09:15 AM	39	129	8	0	13	21	30	0	15	162	15	0	19	25	23	0	499	
09:30 AM	37	148	17	0	16	11	37	0	9	159	15	0	26	31	22	0	528	
09:45 AM	26	135	23	0	15	15	33	0	12	167	11	0	12	19	30	0	498	
<b>Total</b>	<b>129</b>	<b>536</b>	<b>64</b>	<b>0</b>	<b>55</b>	<b>61</b>	<b>147</b>	<b>0</b>	<b>49</b>	<b>663</b>	<b>52</b>	<b>0</b>	<b>83</b>	<b>113</b>	<b>105</b>	<b>0</b>	<b>2057</b>	
10:00 AM	36	152	16	0	13	12	35	0	5	146	8	0	30	26	18	0	497	
10:15 AM	44	155	16	0	14	18	37	0	16	150	20	0	15	27	26	0	538	
10:30 AM	39	161	10	0	18	23	47	0	14	162	13	0	11	13	25	0	536	
10:45 AM	33	149	14	0	17	18	37	0	12	136	12	0	19	13	27	0	487	
<b>Total</b>	<b>152</b>	<b>617</b>	<b>56</b>	<b>0</b>	<b>62</b>	<b>71</b>	<b>156</b>	<b>0</b>	<b>47</b>	<b>594</b>	<b>53</b>	<b>0</b>	<b>75</b>	<b>79</b>	<b>96</b>	<b>0</b>	<b>2058</b>	
11:00 AM	32	160	15	0	24	13	34	0	13	138	22	0	25	19	26	0	521	
11:15 AM	34	189	17	0	16	21	38	0	26	174	19	0	20	23	33	0	610	
11:30 AM	39	163	22	0	23	22	37	0	13	150	21	0	23	18	37	0	568	
11:45 AM	33	175	25	0	23	23	48	0	27	187	19	0	22	25	35	0	642	
<b>Total</b>	<b>138</b>	<b>687</b>	<b>79</b>	<b>0</b>	<b>86</b>	<b>79</b>	<b>157</b>	<b>0</b>	<b>79</b>	<b>649</b>	<b>81</b>	<b>0</b>	<b>90</b>	<b>85</b>	<b>131</b>	<b>0</b>	<b>2341</b>	
12:00 PM	44	152	22	0	14	24	39	0	25	189	17	0	27	23	32	0	608	
12:15 PM	43	213	30	0	18	27	36	0	24	189	15	0	22	16	33	0	666	
12:30 PM	40	187	33	0	18	21	43	0	21	167	27	0	37	18	37	0	649	
12:45 PM	28	193	25	0	25	17	44	0	29	177	20	0	22	37	32	0	649	
<b>Total</b>	<b>155</b>	<b>745</b>	<b>110</b>	<b>0</b>	<b>75</b>	<b>89</b>	<b>162</b>	<b>0</b>	<b>99</b>	<b>722</b>	<b>79</b>	<b>0</b>	<b>108</b>	<b>94</b>	<b>134</b>	<b>0</b>	<b>2572</b>	
01:00 PM	47	194	20	0	18	30	47	0	23	201	30	0	20	32	26	0	688	
01:15 PM	49	177	26	0	31	33	46	0	37	151	19	0	21	20	35	0	645	
01:30 PM	50	222	35	0	23	30	51	0	20	227	19	0	30	40	37	0	784	
01:45 PM	42	212	13	0	28	32	37	0	32	193	18	0	24	39	39	0	709	
<b>Total</b>	<b>188</b>	<b>805</b>	<b>94</b>	<b>0</b>	<b>100</b>	<b>125</b>	<b>181</b>	<b>0</b>	<b>112</b>	<b>772</b>	<b>86</b>	<b>0</b>	<b>95</b>	<b>131</b>	<b>137</b>	<b>0</b>	<b>2828</b>	
02:00 PM	33	172	27	0	23	34	60	0	35	194	27	0	13	34	26	0	678	
02:15 PM	34	193	30	0	32	41	51	0	30	229	27	0	31	28	35	0	761	
02:30 PM	48	199	40	0	24	59	50	0	40	217	35	0	40	56	51	0	859	
02:45 PM	37	209	40	0	24	66	59	0	37	191	31	0	32	49	53	0	828	
<b>Total</b>	<b>152</b>	<b>773</b>	<b>137</b>	<b>0</b>	<b>103</b>	<b>200</b>	<b>220</b>	<b>0</b>	<b>142</b>	<b>831</b>	<b>120</b>	<b>0</b>	<b>116</b>	<b>167</b>	<b>165</b>	<b>0</b>	<b>3126</b>	
03:00 PM	62	200	36	0	28	47	49	0	45	190	15	0	46	63	58	0	839	
03:15 PM	48	273	33	0	25	46	48	0	22	216	26	0	29	51	38	0	855	
03:30 PM	45	226	35	0	28	55	43	0	26	191	25	0	40	72	47	0	833	
03:45 PM	43	269	30	0	29	50	46	0	34	209	28	0	30	54	48	0	870	
<b>Total</b>	<b>198</b>	<b>968</b>	<b>134</b>	<b>0</b>	<b>110</b>	<b>198</b>	<b>186</b>	<b>0</b>	<b>127</b>	<b>806</b>	<b>94</b>	<b>0</b>	<b>145</b>	<b>240</b>	<b>191</b>	<b>0</b>	<b>3397</b>	
04:00 PM	50	250	44	0	35	49	38	0	37	210	31	0	33	57	51	0	885	
04:15 PM	40	242	30	0	38	40	64	0	32	188	31	0	23	45	45	0	818	
04:30 PM	45	244	25	0	24	66	52	0	29	157	36	0	38	48	54	0	818	
04:45 PM	57	228	29	0	40	44	48	0	41	189	26	0	35	55	62	0	854	
<b>Total</b>	<b>192</b>	<b>964</b>	<b>128</b>	<b>0</b>	<b>137</b>	<b>199</b>	<b>202</b>	<b>0</b>	<b>139</b>	<b>744</b>	<b>124</b>	<b>0</b>	<b>129</b>	<b>205</b>	<b>212</b>	<b>0</b>	<b>3375</b>	

### Metro Louisville Traffic Engineering

File Name : Dixie Hwy & Stonestreet Rd  
 Site Code :  
 Start Date : 4/14/2015  
 Page No : 2

Groups Printed- cars - trucks - pedal bikes

Start Time	Dixie Hwy From North				Stonestreet Rd From East				Dixie Hwy From South				Johnsontown Rd From West				Int	Total
	Left	Thru	Right	U-Turns	Left	Thru	Right	U-Turns	Left	Thru	Right	U-Turns	Left	Thru	Right	U-Turns		
05:00 PM	64	225	40	0	36	61	66	0	46	187	29	0	39	48	41	0	882	
05:15 PM	55	284	32	0	26	45	48	0	40	186	35	0	41	55	44	0	891	
05:30 PM	46	265	24	0	26	48	61	0	29	211	43	0	25	52	57	0	887	
05:45 PM	48	240	26	0	30	67	36	0	41	224	19	0	16	49	54	0	850	
<b>Total</b>	<b>213</b>	<b>1014</b>	<b>122</b>	<b>0</b>	<b>118</b>	<b>221</b>	<b>211</b>	<b>0</b>	<b>156</b>	<b>808</b>	<b>126</b>	<b>0</b>	<b>121</b>	<b>204</b>	<b>196</b>	<b>0</b>	<b>3510</b>	
06:00 PM	36	220	17	0	28	52	51	0	31	175	41	0	27	32	41	0	751	
06:15 PM	40	246	24	0	23	29	47	0	40	210	36	0	24	28	54	0	801	
06:30 PM	40	236	14	0	24	27	36	0	37	189	20	0	12	22	42	0	699	
06:45 PM	43	180	21	0	24	36	34	0	29	184	27	0	26	37	48	0	689	
<b>Total</b>	<b>159</b>	<b>882</b>	<b>76</b>	<b>0</b>	<b>99</b>	<b>144</b>	<b>168</b>	<b>0</b>	<b>137</b>	<b>758</b>	<b>124</b>	<b>0</b>	<b>89</b>	<b>119</b>	<b>185</b>	<b>0</b>	<b>2940</b>	
<b>Grand Total</b>	<b>1957</b>	<b>8836</b>	<b>1226</b>	<b>0</b>	<b>1058</b>	<b>1683</b>	<b>2131</b>	<b>0</b>	<b>1216</b>	<b>8816</b>	<b>1057</b>	<b>0</b>	<b>1296</b>	<b>1791</b>	<b>1778</b>	<b>0</b>	<b>32845</b>	
Approch %	16.3	73.5	10.2	0	21.7	34.5	43.7	0	11	79.5	9.5	0	26.6	36.8	36.5	0		
Total %	6	26.9	3.7	0	3.2	5.1	6.5	0	3.7	26.8	3.2	0	3.9	5.5	5.4	0		
cars	1893	8602	1193	0	1040	1631	2071	0	1186	8572	1035	0	1275	1723	1729	0	31950	
% cars	96.7	97.4	97.3	0	98.3	96.9	97.2	0	97.5	97.2	97.9	0	98.4	96.2	97.2	0	97.3	
trucks	64	232	33	0	18	51	60	0	30	240	21	0	21	68	49	0	887	
% trucks	3.3	2.6	2.7	0	1.7	3	2.8	0	2.5	2.7	2	0	1.6	3.8	2.8	0	2.7	
pedal bikes	0	2	0	0	0	1	0	0	0	4	1	0	0	0	0	0	8	
% pedal bikes	0	0	0	0	0	0.1	0	0	0	0	0.1	0	0	0	0	0	0	

Start Time	Dixie Hwy From North					Stonestreet Rd From East					Dixie Hwy From South					Johnsontown Rd From West					Int	Total
	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total		
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																						
Peak Hour for Entire Intersection Begins at 07:00 AM																						
07:00 AM	27	85	13	0	125	8	33	45	0	86	13	<b>214</b>	13	0	<b>240</b>	26	43	22	0	91	542	
07:15 AM	33	<b>114</b>	35	0	<b>182</b>	12	43	40	0	95	13	211	8	0	232	23	40	26	0	89	598	
07:30 AM	<b>41</b>	<b>96</b>	<b>37</b>	0	174	13	46	36	0	95	<b>24</b>	167	<b>15</b>	0	206	<b>50</b>	<b>62</b>	<b>30</b>	0	<b>142</b>	<b>617</b>	
07:45 AM	25	100	36	0	161	<b>21</b>	<b>48</b>	<b>46</b>	0	<b>115</b>	17	172	13	0	202	37	55	27	0	119	597	
Total Volume	126	395	121	0	642	54	170	167	0	391	67	764	49	0	880	136	200	105	0	441	2354	
% App. Total	19.6	61.5	18.8	0		13.8	43.5	42.7	0		7.6	86.8	5.6	0		30.8	45.4	23.8	0			
PHF	768	886	818	000	882	643	885	908	000	850	698	893	817	000	917	680	806	875	000	776	954	

Start Time	Dixie Hwy From North					Stonestreet Rd From East					Dixie Hwy From South					Johnsontown Rd From West					Int	Total
	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total		
Peak Hour Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1																						
Peak Hour for Entire Intersection Begins at 04:45 PM																						
04:45 PM	57	228	29	0	314	<b>40</b>										<b>55</b>	<b>62</b>			<b>152</b>		
05:00 PM	<b>64</b>	225	<b>40</b>	0	329	36	<b>61</b>	<b>66</b>	0	<b>163</b>	<b>46</b>	187	29	0	262	39	48	41	0	128	882	
05:15 PM	55	<b>284</b>	32	0	<b>371</b>	26	45	48	0	119	40	186	35	0	261	<b>41</b>	55	44	0	140	<b>891</b>	
05:30 PM	46	265	24	0	335	26	48	61	0	135	29	<b>211</b>	<b>43</b>	0	<b>283</b>	25	52	57	0	134	887	
Total Volume	222	1002	125	0	1349	128	198	223	0	549	156	773	133	0	1062	140	210	204	0	554	3514	
% App. Total	16	74	9.3	0		23	36	40	0		14	72	12	0		25	37	36	0			
	5	3				3	1	6	0		7	8	5	0		3	9	8	0			
PHF	86	88	78	00	909	80	81	84	00	842	84	91	77	00	938	85	95	82	00	911	986	
	7	2	1	0		0	1	5	0		8	6	3	0		4	5	3	0			