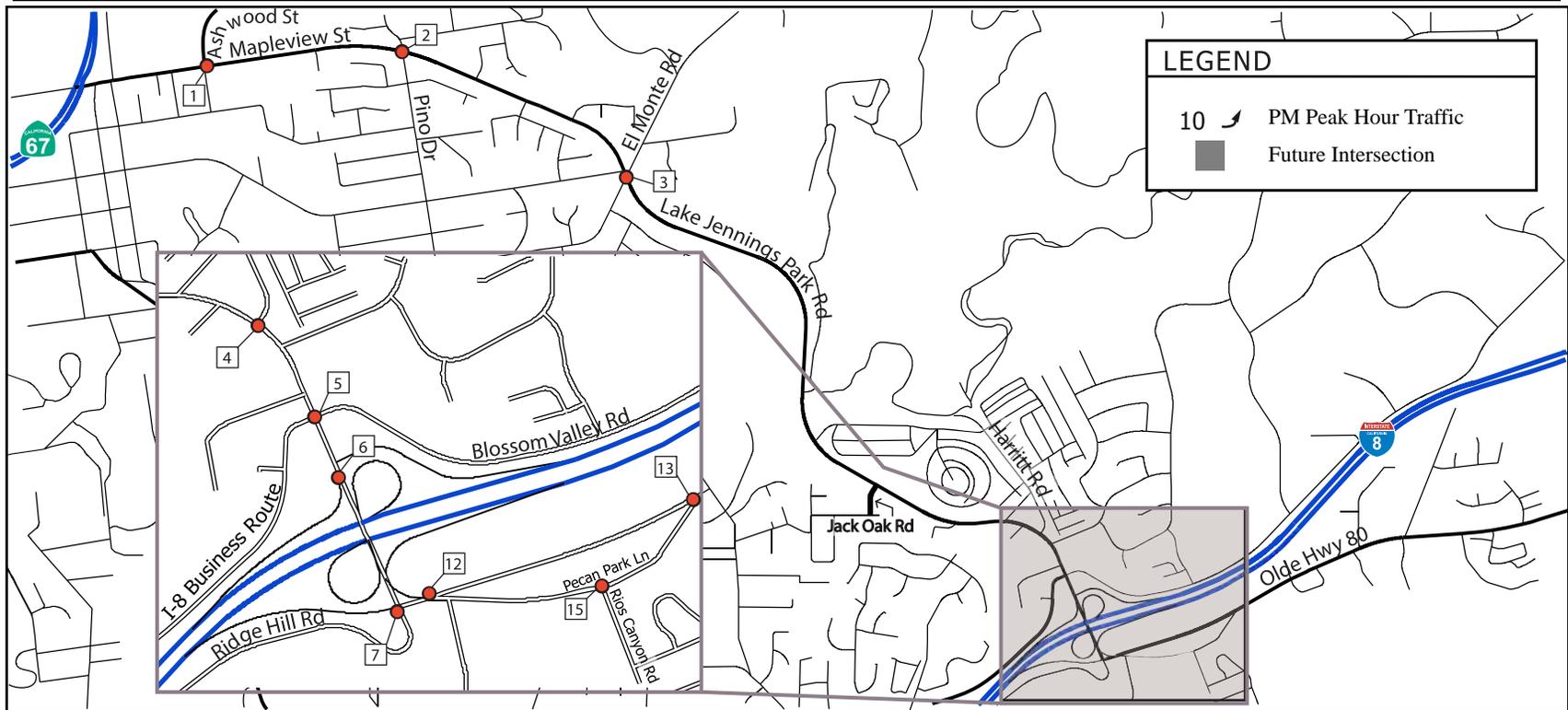


<p>Mapleview St & Ashwood St</p> <table border="1"> <tr> <td>↖ 458</td> <td>↗ 161</td> <td>↖ 263</td> <td>↗ 512</td> </tr> <tr> <td>↘ 135</td> <td>↙ 43</td> <td>↘ 263</td> <td>↙ 43</td> </tr> <tr> <td>↖ 273</td> <td>↗ 222</td> <td>↖ 45</td> <td>↗ 150</td> </tr> <tr> <td>↘ 61</td> <td>↙ 35</td> <td>↘ 150</td> <td>↙ 35</td> </tr> </table> <p>1</p>	↖ 458	↗ 161	↖ 263	↗ 512	↘ 135	↙ 43	↘ 263	↙ 43	↖ 273	↗ 222	↖ 45	↗ 150	↘ 61	↙ 35	↘ 150	↙ 35	<p>Mapleview St & Pino Dr</p> <table border="1"> <tr> <td>↖ 26</td> <td>↗ 18</td> <td>↖ 516</td> <td>↗ 17</td> </tr> <tr> <td>↘ 3</td> <td>↙ 17</td> <td>↘ 516</td> <td>↙ 17</td> </tr> <tr> <td>↖ 319</td> <td>↗ 8</td> <td>↖ 114</td> <td>↗ 12</td> </tr> <tr> <td>↘ 55</td> <td>↙ 35</td> <td>↘ 114</td> <td>↙ 35</td> </tr> </table> <p>2</p>	↖ 26	↗ 18	↖ 516	↗ 17	↘ 3	↙ 17	↘ 516	↙ 17	↖ 319	↗ 8	↖ 114	↗ 12	↘ 55	↙ 35	↘ 114	↙ 35	<p>Lake Jennings Park Rd & El Monte Rd</p> <table border="1"> <tr> <td>↖ 17</td> <td>↗ 217</td> <td>↖ 24</td> <td>↗ 38</td> </tr> <tr> <td>↘ 18</td> <td>↙ 40</td> <td>↘ 24</td> <td>↙ 38</td> </tr> <tr> <td>↖ 60</td> <td>↗ 27</td> <td>↖ 145</td> <td>↗ 417</td> </tr> <tr> <td>↘ 102</td> <td>↙ 24</td> <td>↘ 145</td> <td>↙ 24</td> </tr> </table> <p>3</p>	↖ 17	↗ 217	↖ 24	↗ 38	↘ 18	↙ 40	↘ 24	↙ 38	↖ 60	↗ 27	↖ 145	↗ 417	↘ 102	↙ 24	↘ 145	↙ 24	<p>Lake Jennings Park Rd & Harritt Rd</p> <table border="1"> <tr> <td>↖ 365</td> <td>↗ 18</td> <td>↖ 32</td> <td>↗ 101</td> </tr> <tr> <td>↘ 18</td> <td>↙ 40</td> <td>↘ 32</td> <td>↙ 101</td> </tr> <tr> <td>↖ 534</td> <td>↗ 40</td> <td>↖ 534</td> <td>↗ 40</td> </tr> <tr> <td>↘ 40</td> <td>↙ 40</td> <td>↘ 40</td> <td>↙ 40</td> </tr> </table> <p>4</p>	↖ 365	↗ 18	↖ 32	↗ 101	↘ 18	↙ 40	↘ 32	↙ 101	↖ 534	↗ 40	↖ 534	↗ 40	↘ 40	↙ 40	↘ 40	↙ 40	<p>Lake Jennings Park Rd & Blossom Valley Rd</p> <table border="1"> <tr> <td>↖ 57</td> <td>↗ 423</td> <td>↖ 72</td> <td>↗ 237</td> </tr> <tr> <td>↘ 69</td> <td>↙ 237</td> <td>↘ 72</td> <td>↙ 237</td> </tr> <tr> <td>↖ 50</td> <td>↗ 73</td> <td>↖ 110</td> <td>↗ 434</td> </tr> <tr> <td>↘ 216</td> <td>↙ 85</td> <td>↘ 110</td> <td>↙ 85</td> </tr> </table> <p>5</p>	↖ 57	↗ 423	↖ 72	↗ 237	↘ 69	↙ 237	↘ 72	↙ 237	↖ 50	↗ 73	↖ 110	↗ 434	↘ 216	↙ 85	↘ 110	↙ 85	<p>Lake Jennings Park Rd & I-8 WB On Ramp</p> <table border="1"> <tr> <td>↖ 589</td> <td>↗ 309</td> <td>↖ 278</td> <td>↗ 16</td> </tr> <tr> <td>↘ 309</td> <td>↙ 16</td> <td>↘ 278</td> <td>↙ 16</td> </tr> <tr> <td>↖ 346</td> <td>↗ 484</td> <td>↖ 346</td> <td>↗ 484</td> </tr> <tr> <td>↘ 484</td> <td>↙ 484</td> <td>↘ 484</td> <td>↙ 484</td> </tr> </table> <p>6</p>	↖ 589	↗ 309	↖ 278	↗ 16	↘ 309	↙ 16	↘ 278	↙ 16	↖ 346	↗ 484	↖ 346	↗ 484	↘ 484	↙ 484	↘ 484	↙ 484	<p>Lake Jennings Park Rd & I-8 EB Off Ramp</p> <table border="1"> <tr> <td>↖ 187</td> <td>↗ 17</td> <td>↖ 161</td> <td>↗ 534</td> </tr> <tr> <td>↘ 17</td> <td>↙ 27</td> <td>↘ 161</td> <td>↙ 27</td> </tr> <tr> <td>↖ 199</td> <td>↗ 278</td> <td>↖ 57</td> <td>↗ 25</td> </tr> <tr> <td>↘ 9</td> <td>↙ 25</td> <td>↘ 57</td> <td>↙ 25</td> </tr> </table> <p>7</p>	↖ 187	↗ 17	↖ 161	↗ 534	↘ 17	↙ 27	↘ 161	↙ 27	↖ 199	↗ 278	↖ 57	↗ 25	↘ 9	↙ 25	↘ 57	↙ 25	<p>Olde Hwy 80 & Driveway 1</p> <p>8</p>
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Figure 4-2
Cumulative Without Project AM Peak Hour Intersection Volumes

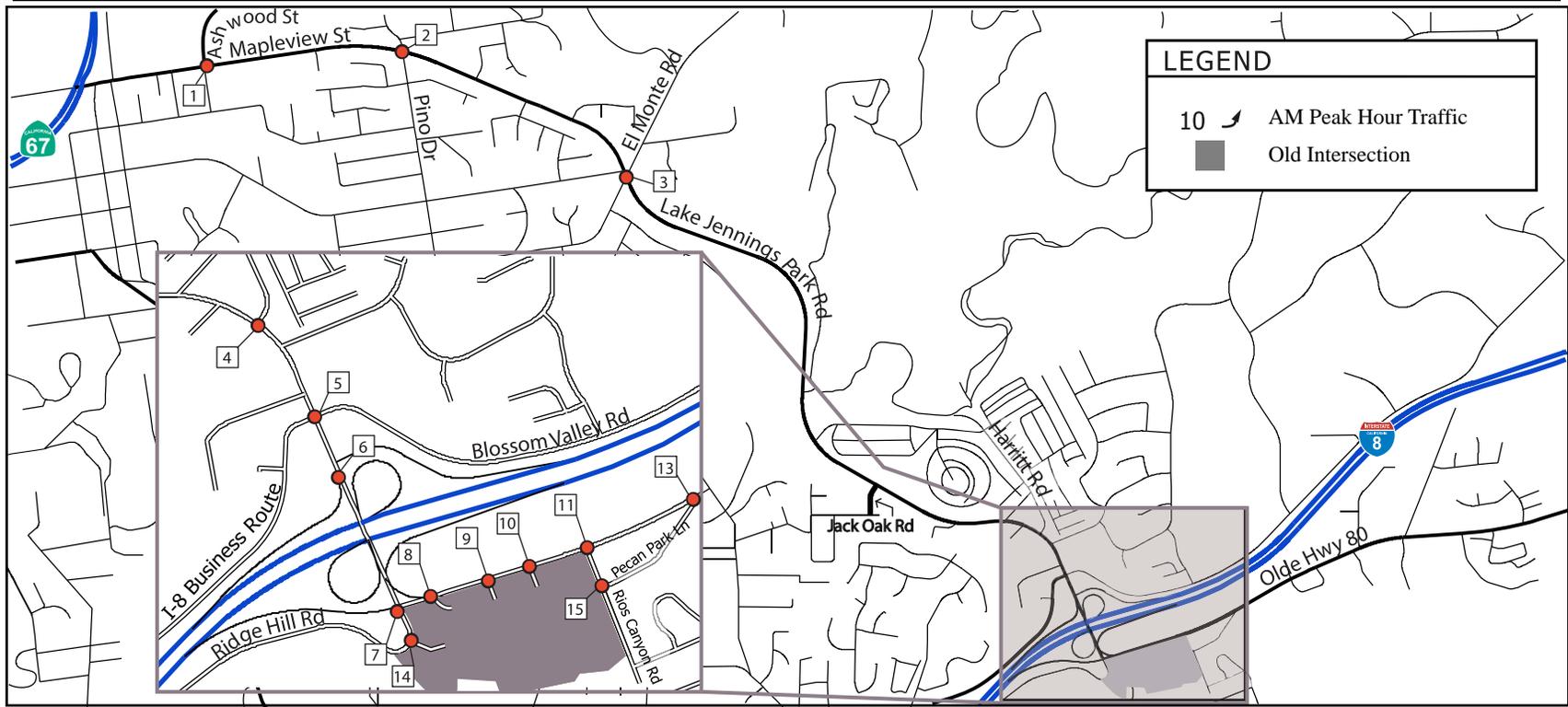




<p>Mapleview St & Ashwood St</p> <table border="1"> <tr> <td>← 374</td> <td>→ 179</td> <td>← 148</td> <td>→ 291</td> </tr> <tr> <td>← 249</td> <td>→ 46</td> <td>← 29</td> <td>→ 16</td> </tr> <tr> <td>← 394</td> <td>→ 504</td> <td>← 18</td> <td>→ 125</td> </tr> <tr> <td>← 62</td> <td>→ 78</td> <td>← 56</td> <td>→ 37</td> </tr> <tr> <td>← 125</td> <td>→ 20</td> <td>← 327</td> <td>→ 20</td> </tr> </table> <p>1</p>	← 374	→ 179	← 148	→ 291	← 249	→ 46	← 29	→ 16	← 394	→ 504	← 18	→ 125	← 62	→ 78	← 56	→ 37	← 125	→ 20	← 327	→ 20	<p>Mapleview St & Pino Dr</p> <table border="1"> <tr> <td>← 20</td> <td>→ 21</td> <td>← 14</td> <td>→ 8</td> </tr> <tr> <td>← 29</td> <td>→ 122</td> <td>← 56</td> <td>→ 37</td> </tr> <tr> <td>← 549</td> <td>→ 20</td> <td>← 327</td> <td>→ 16</td> </tr> <tr> <td>← 56</td> <td>→ 37</td> <td>← 20</td> <td>→ 20</td> </tr> </table> <p>2</p>	← 20	→ 21	← 14	→ 8	← 29	→ 122	← 56	→ 37	← 549	→ 20	← 327	→ 16	← 56	→ 37	← 20	→ 20	<p>Lake Jennings Park Rd & El Monte Rd</p> <table border="1"> <tr> <td>← 35</td> <td>→ 86</td> <td>← 28</td> <td>→ 56</td> </tr> <tr> <td>← 24</td> <td>→ 43</td> <td>← 33</td> <td>→ 90</td> </tr> <tr> <td>← 168</td> <td>→ 288</td> <td>← 22</td> <td>→ 22</td> </tr> </table> <p>3</p>	← 35	→ 86	← 28	→ 56	← 24	→ 43	← 33	→ 90	← 168	→ 288	← 22	→ 22	<p>Lake Jennings Park Rd & Harritt Rd</p> <table border="1"> <tr> <td>← 640</td> <td>→ 45</td> <td>← 21</td> <td>→ 80</td> </tr> <tr> <td>← 403</td> <td>→ 105</td> <td></td> <td></td> </tr> </table> <p>4</p>	← 640	→ 45	← 21	→ 80	← 403	→ 105			<p>Lake Jennings Park Rd & Blossom Valley Rd</p> <table border="1"> <tr> <td>← 75</td> <td>→ 663</td> <td>← 44</td> <td>→ 25</td> </tr> <tr> <td>← 171</td> <td>→ 167</td> <td>← 143</td> <td>→ 494</td> </tr> <tr> <td>← 185</td> <td>→ 185</td> <td></td> <td></td> </tr> </table> <p>5</p>	← 75	→ 663	← 44	→ 25	← 171	→ 167	← 143	→ 494	← 185	→ 185			<p>Lake Jennings Park Rd & I-8 WB On Ramp</p> <table border="1"> <tr> <td>← 337</td> <td>→ 536</td> <td>← 203</td> <td>→ 17</td> </tr> <tr> <td>← 619</td> <td>→ 377</td> <td></td> <td></td> </tr> </table> <p>6</p>	← 337	→ 536	← 203	→ 17	← 619	→ 377			<p>Lake Jennings Park Rd & I-8 EB Off Ramp</p> <table border="1"> <tr> <td>← 329</td> <td>→ 28</td> <td>← 189</td> <td>→ 527</td> </tr> <tr> <td>← 434</td> <td>→ 476</td> <td>← 39</td> <td>→ 26</td> </tr> <tr> <td>← 39</td> <td>→ 39</td> <td>← 39</td> <td>→ 20</td> </tr> </table> <p>7</p>	← 329	→ 28	← 189	→ 527	← 434	→ 476	← 39	→ 26	← 39	→ 39	← 39	→ 20	<p>Olde Hwy 80 & Driveway 1</p> <table border="1"> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>8</p>				
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Figure 4-3
Cumulative Without Project PM Peak Hour Intersection Volumes

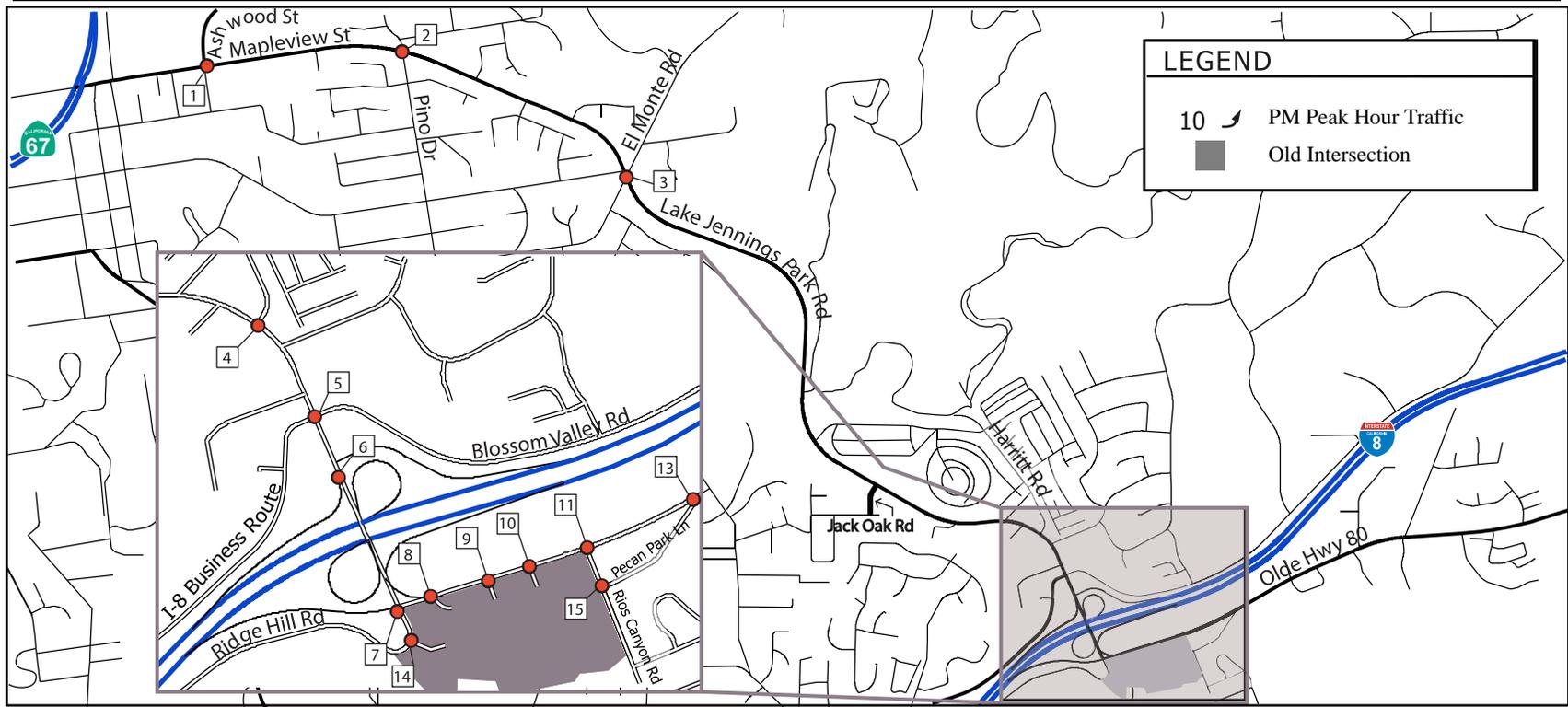




<p>Mapleview St & Ashwood St</p> <table border="1"> <tr> <td>458</td> <td>161</td> <td>266</td> <td>521</td> </tr> <tr> <td>273</td> <td>234</td> <td>45</td> <td>150</td> </tr> <tr> <td>61</td> <td></td> <td>36</td> <td></td> </tr> </table> <p>1</p>	458	161	266	521	273	234	45	150	61		36		<p>Mapleview St & Pino Dr</p> <table border="1"> <tr> <td>26</td> <td>18</td> <td>3</td> <td>529</td> </tr> <tr> <td>8</td> <td>337</td> <td>114</td> <td>12</td> </tr> <tr> <td>55</td> <td></td> <td>35</td> <td></td> </tr> </table> <p>2</p>	26	18	3	529	8	337	114	12	55		35		<p>Lake Jennings Park Rd & El Monte Rd</p> <table border="1"> <tr> <td>17</td> <td>280</td> <td>16</td> <td>24</td> </tr> <tr> <td>60</td> <td>27</td> <td>148</td> <td>48</td> </tr> <tr> <td>106</td> <td></td> <td>427</td> <td>23</td> </tr> </table> <p>3</p>	17	280	16	24	60	27	148	48	106		427	23	<p>Lake Jennings Park Rd & Harritt Rd</p> <table border="1"> <tr> <td>397</td> <td>18</td> <td>32</td> <td>106</td> </tr> <tr> <td>568</td> <td></td> <td>44</td> <td></td> </tr> </table> <p>4</p>	397	18	32	106	568		44		<p>Lake Jennings Park Rd & Blossom Valley Rd</p> <table border="1"> <tr> <td>57</td> <td>491</td> <td>59</td> <td>72</td> </tr> <tr> <td>50</td> <td>78</td> <td>127</td> <td>57</td> </tr> <tr> <td>238</td> <td></td> <td>482</td> <td>92</td> </tr> </table> <p>5</p>	57	491	59	72	50	78	127	57	238		482	92	<p>Lake Jennings Park Rd & I-8 WB On Ramp</p> <table border="1"> <tr> <td>559</td> <td>406</td> <td>278</td> <td>31</td> </tr> <tr> <td>416</td> <td></td> <td>549</td> <td></td> </tr> </table> <p>6</p>	559	406	278	31	416		549		<p>Lake Jennings Park Rd & I-8 EB Off Ramp</p> <table border="1"> <tr> <td>187</td> <td>32</td> <td>284</td> <td>693</td> </tr> <tr> <td>199</td> <td>380</td> <td>87</td> <td>27</td> </tr> <tr> <td>22</td> <td></td> <td>25</td> <td></td> </tr> </table> <p>7</p>	187	32	284	693	199	380	87	27	22		25		<p>Olde Hwy 80 & Driveway 1</p> <table border="1"> <tr> <td>715</td> <td></td> <td></td> <td></td> </tr> <tr> <td>599</td> <td></td> <td></td> <td></td> </tr> <tr> <td>31</td> <td></td> <td></td> <td></td> </tr> </table> <p>8</p>	715				599				31			
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Figure 4-5
Cumulative With Project AM Peak Hour Intersection Volumes





<p>Mapleview St & Ashwood St</p> <p>←374 ←179 ←257 →156 →315 →48</p> <p>394 528 62</p> <p>18 125 80</p> <p>1</p>	<p>Mapleview St & Pino Dr</p> <p>←20 ←21 ←8 →14 →362 →16</p> <p>29 584 122</p> <p>56 37 20</p> <p>2</p>	<p>Lake Jennings Park Rd & El Monte Rd</p> <p>←35 ←34 ←24 →28 →38 →56</p> <p>43 33 176</p> <p>98 320 22</p> <p>3</p>	<p>Lake Jennings Park Rd & Harritt Rd</p> <p>←732 ←45 →21 →90</p> <p>487 115</p> <p>4</p>	<p>Lake Jennings Park Rd & Blossom Valley Rd</p> <p>←75 ←680 ←75 →44 →25 →182</p> <p>64 42 213</p> <p>185 615 201</p> <p>5</p>	<p>Lake Jennings Park Rd & I-8 WB On Ramp</p> <p>←337 ←707 →203 →44</p> <p>795 542</p> <p>6</p>	<p>Lake Jennings Park Rd & I-8 EB Off Ramp</p> <p>←329 ←56 ←24 →919 →27</p> <p>434 663 63</p> <p>105 21</p> <p>7</p>	<p>Olde Hwy 80 & Driveway 1</p> <p>←897</p> <p>1039 57</p> <p>8</p>
<p>Olde Hwy 80 & Driveway 2</p> <p>←35 ←2 →531 →77</p> <p>35 699 305</p> <p>384 34</p> <p>9</p>	<p>Olde Hwy 80 & Driveway 3</p> <p>←610</p> <p>733 22</p> <p>23</p> <p>10</p>	<p>Olde Hwy 80 & Rios Canyon Rd</p> <p>←2 →493 →18</p> <p>2 581 173</p> <p>116 34</p> <p>11</p>	<p>Olde Hwy 80 & Pecan Park Ln West</p> <p>12</p>	<p>Olde Hwy 80 & Pecan Park Ln East</p> <p>←493</p> <p>596 5</p> <p>6</p> <p>13</p>	<p>Ridge Hill Rd & Driveway 4</p> <p>←93 ←62 →72 →28</p> <p>53 28</p> <p>14</p>	<p>Rios Canyon Rd & Pecan Park Ln</p> <p>←191</p> <p>→10</p> <p>150 6</p> <p>15</p>	

Figure 4-6
Cumulative With Project PM Peak Hour Intersection Volumes



Table 4-1 - Cumulative With Project Conditions Roadway Segment Analysis Summary

Roadway Segment	Existing Lanes / Configuration	LOS E Cap.	Cumulative Without Project		Cumulative With Project		Δ Traffic	Significant?	With Mitigation		
			ADT	LOS	ADT	LOS			New Lanes/ Config.	New LOS E Cap.	LOS
Olde Highway 80											
Lake Jennings Park Rd. to Dwy 1	2CCITL	19,000	15,072	E	23,428	F	7,584	Yes	4BITL	28,000	D
Project Dwy 1 to Dwy 2	2CCnM	16,200	15,072	E	22,856	F	7,013	Yes	4BITL	28,000	D
Project Dwy 2 to Dwy 3	2CCnM	16,200	15,072	E	16,720	F	1,561	Yes	4BITL	28,000	A
Project Dwy 3 to Old Rios Canyon Rd.	2CCnM	16,200	15,072	E	16,555	F	1,396	Yes	4BITL	28,000	A
Rios Canyon Rd. to Pecan Park Ln.	2CCnM	16,200	10,661	D	11,679	E	931	Yes	2CCITL	19,000	D
Pecan Park Ln. to Chimney Rock Ln.	2CCITL	19,000	10,556	D	11,565	D	922	No			
Mapleview Street											
Ashwood St. to Pino Dr.	4MRITL	34,200	12,604	A	13,325	A	721	No			
Lake Jennings Park Road											
Pino Dr. to El Monte Rd.	4MRITL	34,200	10,923	A	11,673	A	749	No			
El Monte Rd. to Jack Oak Rd.	2CCITL	19,000	11,827	D	12,791	D	965	No			
Jack Oak Rd. to Harritt Rd.	2CCITL	19,000	12,100	D	13,954	E	1,769	Yes			
Harrit Rd. to Blossom Valley Rd.	2CCITL	19,000	14,232	E	16,657	E	2,226	Yes	4BITL	28,000	A
Blossom Valley Rd. to I-8 WB Off-Ramp	2CCITL	19,000	19,442	F	22,931	F	3,317	Yes	4BITL	28,000	D
I-8 WB Off-Ramp to Olde Highway 80	2CCnM	16,200	17,992	F	23,703	F	5,128	Yes	4BITL	28,000	D
Olde Highway 80 to Driveway 4	2CCnM	16,200	1,754	A	3,018	B	1,264	No			
Ridge Hill Road											
Lake Jennings Park Rd. to Cordial Rd.	2RC	4,500	1,754	Better than C	2,186	Better than C	432	No			
Rios Canyon Road											
South of Olde Highway 80	2LCRS	9,700	3,682	A	3,970	A	288	No			

Abbreviations:

2CCnM is a 2 lane Community Collector with no Median.
 2CCITL is a 2 lane Community Collector with an Intermittent Turn Lane.
 4MRITL is a 4 lane Major Road with an Intermittent Turn Lane.
 4BITL is a Boulevard with an Intermittent Turn Lane
 2RC is a 2 lane Residential Collector
 2LCRS is a 2 lane Light Collector with a Reduced Shoulder

As shown in Table 4-1, all of the impacted segments, except for the segment of Lake Jennings Park Road from Jack Oak Road to Harritt Road, would all be mitigated to avoid cumulative impacts with the recommended roadway improvements. The recommended roadway improvements are shown in Appendix D.

The segment of Lake Jennings Park Road from Jack Oak Road to Harritt Road will experience LOS E for Cumulative With Project conditions, and the project would normally have a cumulative impact at this segment. However, this portion of roadway does not really conform to the normal list of facilities given the availability of a climbing lane southbound and southerly from El Monte Road, the painted median just south of Jack Oak Road, and the width of the pavement and limited conflicts from there to Harritt Road further to the south. Also, as demonstrated by the intersection analysis along this portion of Lake Jennings Park Road it will be operating acceptably (LOS = A-C) despite this LOS anomaly when compared to the normal acceptable daily volumes. Therefore, the practical capacity is indeed something greater than the values used in the tables for making our assessment of adequacy. The improvements being proposed by the applicant to Lake Jennings Park Road between Harritt Road and Olde Highway 8 constitutes a substantial proportional contribution to the project's effects throughout this area.

4.4 CUMULATIVE WITH PROJECT CONDITIONS INTERSECTION ANALYSIS

Table 4-2 summarizes the intersection operations analysis results for Cumulative conditions without and with the project. The intersection operations analysis methodology is described in Section 2.2.3 of this report. Cumulative Without Project conditions intersection operations analysis worksheets are included in Appendix G. Cumulative With Project conditions intersection operations analysis worksheets are included in Appendix H. Without any improvements by the project, most of the study area intersections would operate at acceptable service levels except for the following three intersections where they would be significantly impacted and would have less than adequate service levels, particularly during the PM peak hour:

- Lake Jennings Park Road and Blossom Valley Road
- Lake Jennings Park Road and I-8 Westbound Off-Ramp
- Lake Jennings Park Road and I-8 Eastbound Off-Ramp

Again, the recommended roadway improvements shown in Appendix D would mitigate the intersection operations to avoid cumulative impacts at intersections.

4.5 CUMULATIVE WITH PROJECT CONDITIONS FREEWAY MAINLINE ANALYSIS

Table 4-3 summarizes the freeway mainline analysis results for Cumulative conditions without and with the project. The intersection operations analysis methodology is described in Section 2.2.4 of this report. As shown in Table 4-3, the study area freeway mainline links would operate at adequate service levels and there is no cumulative impact by the project.

4.6 CUMULATIVE WITH PROJECT CONDITIONS RAMP METER ANALYSIS

Table 4-4 summarizes the ramp meter analysis results for Cumulative conditions without and with the project. The ramp meter analysis methodology is described in Section 2.2.5 of this report. As shown in Table 4-4, there is no cumulative impact by the project on the ramp meter queuing.

**Table 4-2 - Cumulative With Project Conditions
Intersection Operations Analysis Summary**

Intersection	Cumulative Without Project		Cumulative With Project		Δ Delay	PH Trips on Critical Movement	Signif?	With Mitigation	
	Delay	LOS	Delay	LOS				Delay	LOS
AM Peak Hour									
1. Mapleview Street and Ashwood Street	28.6	C	28.6	C	0.0	-	No		NA
2. Mapleview Street and Pino Drive	18.6	B	18.5	B	-0.1	-	No		NA
3. Lake Jennings Park Road and El Monte Road	16.3****	C	16.0****	C	-0.3	-	No		NA
4. Lake Jennings Park Road and Harrit Road	11.9	B	12.6	B	0.7	-	No		NA
5. Lake Jennings Park Road and Blossom Valley Road*	36.9	D	41.4	D	4.5	-	No	31.3	C
6. Lake Jennings Park Road and I-8 WB Off Ramp**	14.3	B	16.3	C	2.0	-	No	12.7	B
7. Lake Jennings Park Road and I-8 EB Off Ramp***	9.8****	A	13.8****	B	4.0	-	No	18.6	B
8. Olde Highway 80 and Project Driveway 1	NA	NA	0.0	A	NA	-	No		NA
9. Olde Highway 80 and Project Driveway 2	NA	NA	27.5	C	NA	-	No		NA
10. Olde Highway 80 and Project Driveway 3	NA	NA	8.9	A	NA	-	No		NA
11. Olde Highway 80 and Rios Canyon Road	NA	NA	17.8	C	NA	-	No		NA
12. Olde Highway 80 and Pecan Park Lane West	26.0	D	NA	NA	NA	-	No		NA
13. Olde Highway 80 and Pecan Park Lane East	14.6	B	10.7	B	-3.9	-	No		NA
14. Ridge Hill Drive and Project Driveway 4	NA	NA	7.5	A	NA	-	No		NA
15. Rios Canyon Road and Pecan Park Lane	10.8	B	10.0	A	-0.8	-	No		NA
PM Peak Hour									
1. Mapleview Street and Ashwood Street	37.9	D	41.7	D	3.8	-	No		NA
2. Mapleview Street and Pino Drive	19.7	B	19.7	B	0.0	-	No		NA
3. Lake Jennings Park Road and El Monte Road	15.2****	C	15.0****	C	-0.2	-	No		NA
4. Lake Jennings Park Road and Harrit Road	8.7	A	9.8	A	1.1	-	No		NA
5. Lake Jennings Park Road and Blossom Valley Road*	44.1	D	82.2	F	38.1	-	Yes	28.9	C
6. Lake Jennings Park Road and I-8 WB Off Ramp**	20.8	C	90.4	F	69.6	20	Yes	19.7	C
7. Lake Jennings Park Road and I-8 EB Off Ramp***	17.1****	C	72.2****	F	55.1	205	Yes	27.2	C
8. Olde Highway 80 and Project Driveway 1	NA	NA	0.0	A	NA	-	No		NA
9. Olde Highway 80 and Project Driveway 2	NA	NA	24.7	C	NA	-	No		NA
10. Olde Highway 80 and Project Driveway 3	NA	NA	9.5	A	NA	-	No		NA
11. Olde Highway 80 and Rios Canyon Road	NA	NA	24.6	C	NA	-	No		NA
12. Olde Highway 80 and Pecan Park Lane West	33.4	D	NA	NA	NA	-	No		NA
13. Olde Highway 80 and Pecan Park Lane East	15.5	C	12.6	B	-2.9	-	No		NA
14. Ridge Hill Drive and Project Driveway 4	NA	NA	7.8	A	NA	-	No		NA
15. Rios Canyon Road and Pecan Park Lane	9.9	A	10.7	B	0.8	-	No		NA

* Mitigation: Extend northbound left turn pocket, modify southbound right turn lane to a shared through/right turn lane

**Mitigation: Expand Lake Jennings Park Road from a 2 lane Community Collector to a 4 lane Major Road

*** Mitigation: Signalize the intersection

**** Average delay calculation for the AWS intersection

Table 4-3 - Cumulative With Project Conditions Freeway Mainline Analysis Summary

Freeway Mainline Segment	Direction of Travel	Lanes (1-way)	Capacity (1)	Peak Hour One-Way Volume	Peak Hour Volume (2)	Peak Hour Factor	Truck Factor (3)	Cumulative Without Project			Cumulative With Project				
								Peak Volume (PCE)(4)	V/C	LOS (5)	Peak Volume (PCE)	V/C	LOS (5)	Increase in VC	Significant?
Weekday AM Peak Hour															
I-8 West of Lake Jennings Park Road	West	2	4,600	3,224	4%	95.0%	97.18%	3,621	0.79	C	3,638	0.79	C	0.004	No
I-8 East of Lake Jennings Park Road	West	2	4,600	2,513	6%	95.0%	97.18%	2,829	0.62	B	2,831	0.62	B	0.000	No
Weekday PM Peak Hour															
I-8 West of Lake Jennings Park Road	East	2	4,600	3,311	5%	95.0%	97.18%	3,724	0.81	C	3,765	0.82	D	0.009	No
I-8 East of Lake Jennings Park Road	East	2	4,600	2,581	4%	95.0%	97.18%	2,908	0.63	C	2,913	0.63	C	0.001	No

1. Obtained from balancing Caltrans peak hour mainline volume by the Caltrans
2. This is the peak hour peak direction volume before adjusting for heavy vehicles. In the weekay PM peak hour and Saturday Midday hour, the peak direction is NB on Interstate 15.
3. Assume 4% trucks and 2%recreational vehicles for a total of 6% heavy vehicles.

$$HVF = 1 / (1 + \text{Percent Truck}(\text{Truck Factor}-1) + \text{Percent Recreation Vehicle}(\text{RV Factor}-1))$$

$$\text{Truck Factor (<2% grade, 5% trucks)} = 1.5$$

$$\text{RV Factor (<2% grade, 2% RV)} = 1.2$$

$$HVF = \boxed{97.18\%}$$

4. PCE=PHV/(PHF*HVF)
5. Level of service based on *SANTEC Guidelines Attachment C* D/C ratio.

Table 4-4 - Cumulative With Project Conditions Ramp Meter Analysis Summary

<i>Location</i>	<i>Peak</i>	<i>Meter</i>	<i>Cumulative Without Project</i>				<i>Cumulative With Project</i>					
			<i>Demand</i>	<i>Excess Demand</i>	<i>Avg. Delay</i>	<i>Avg. Queue</i>	<i>Demand</i>	<i>Excess Demand</i>	<i>Avg.</i>	<i>Avg. Queue</i>	<i>Increase in Delay (Minutes)</i>	<i>Significant?</i>
I-8 WB from NB Lake Jennings Park Road	AM	636	449	0	0	0	552	0	0.0	0	0	No
I-8 WB from SB Lake Jennings Park Road	AM	636	532	0	0	0	557	0	0.0	0	0	No

CHAPTER 5 GENERAL PLAN BUILDOUT CONDITIONS

General Plan Buildout conditions represent long-range traffic conditions in 2035.

5.1 GENERAL PLAN BUILDOUT BASELINE TRAFFIC VOLUMES

Traffic growth on area roadways is a function of the expected land development, economic activity, and changes in demographics. Several methods can be used to estimate this growth. For this analysis SANDAG Series 12 traffic forecast model was used to develop General Plan Buildout baseline volumes. Previously the project had been approved for 160 condominiums which were reflected in the model as being built over time. Mobility Element classifications that reflect buildout of roadways was also used for the analysis. Table 5-1 compares the proposed versus the previously approved project.

**Table 5-1
Proposed vs Approved**

Type	ADT
Neighborhood Commercial	10,992
Condominiums: 160	1,280
Increase	9,712

The segment classification was assumed to be built out per the Mobility Element therefore was used in the analysis. Appendix B contains detailed information about volume development. The General Plan Buildout Without Project daily traffic volumes are shown in Figure 5-1.

5.2 GENERAL PLAN BUILDOUT WITH PROJECT CONDITIONS TRAFFIC VOLUMES

The General Plan Buildout With Project daily traffic volumes are shown in Figure 5-2.

5.3 GENERAL PLAN BUILDOUT WITH PROJECT CONDITIONS ROADWAY SEGMENT ANALYSIS

Table 5-2 summarizes the roadway segment analysis results for General Plan Buildout conditions without and with the project. The roadway segment analysis methodology is described in Section 2.2.1 of this report. With the improvements being made by the project, there would be no impacts to the study area.

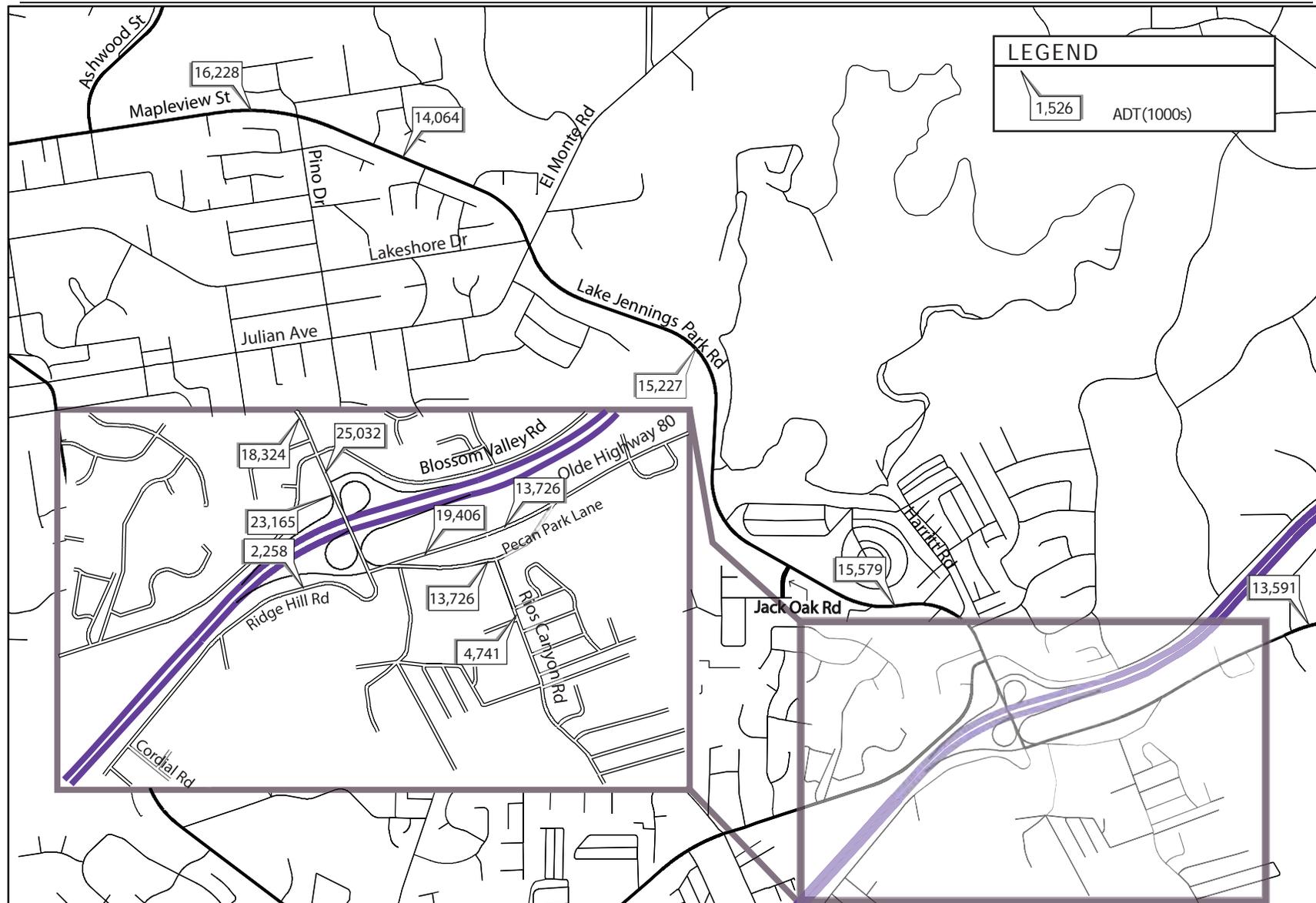


Figure 5-1

General Plan Buildout Without Project Daily Roadway Segment Volumes



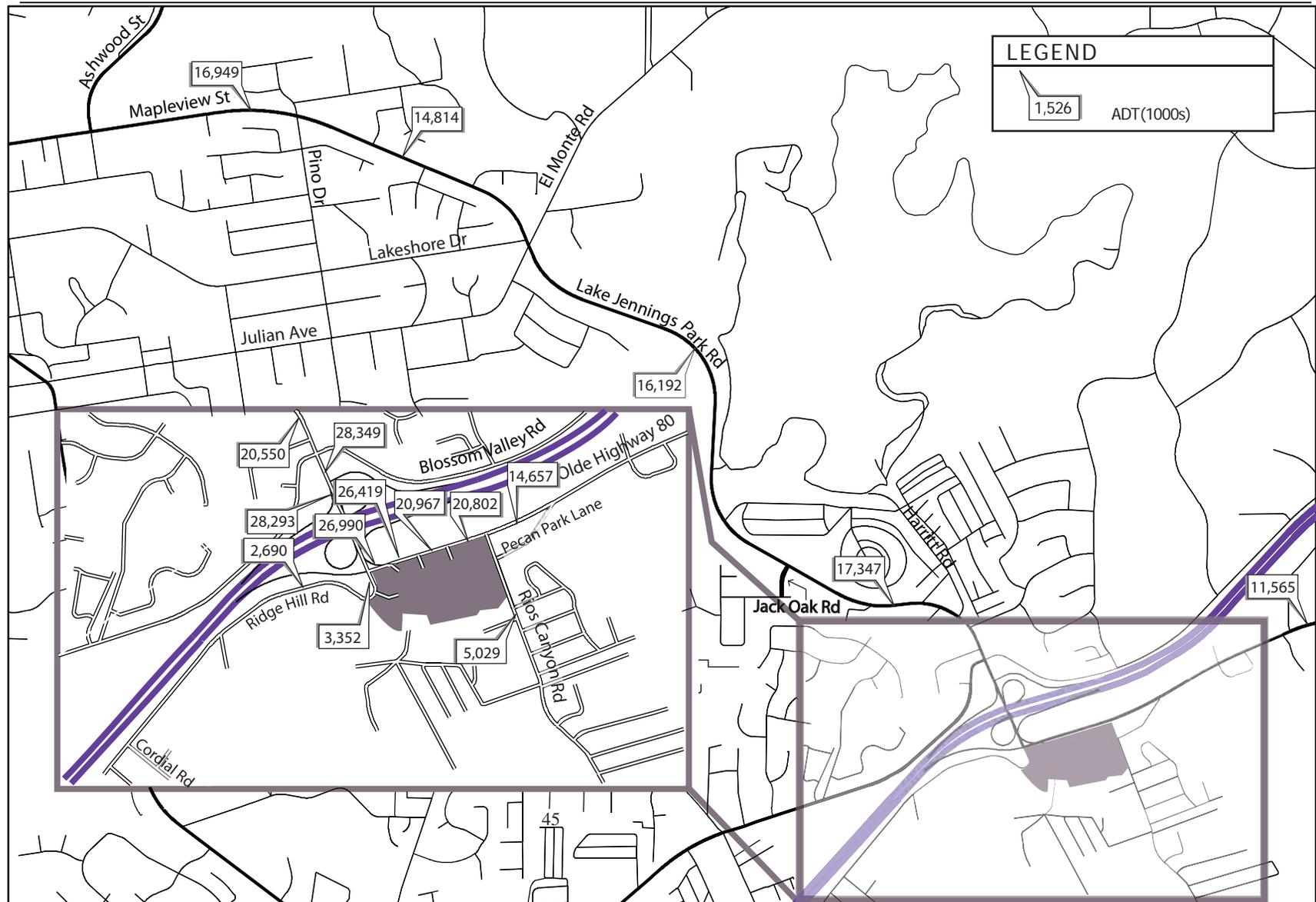


Figure 5-2
General Plan Buildout With Project Daily Roadway Segment Volumes



Table 5-2 - General Plan Buildout With Project Conditions Roadway Segment Analysis Summary

Roadway Segment	Mobility Element Lanes / Configuration	LOS E Cap.	GP Buildout Without Project		GP Buildout With Project		Δ Traffic	Significant?
			ADT	LOS	ADT	LOS		
Olde Highway 80								
Lake Jennings Park Rd. to Dwy 1	4MRITL	34,200	19,406	B	26,990	C	7,584	No
Project Dwy 1 to Dwy 2	4MRITL	34,200	19,406	B	26,419	C	7,013	No
Project Dwy 2 to Dwy 3	4MRITL	34,200	19,406	B	20,967	B	1,561	No
Project Dwy 3 to Old Rios Canyon Rd.	4MRITL	34,200	19,406	B	20,802	B	1,396	No
Rios Canyon Rd. to Pecan Park Ln.	4MRITL	34,200	13,726	B	14,657	B	931	No
Pecan Park Ln. to Chimney Rock Ln.	4MRITL	34,200	13,591	A	14,513	B	922	No
Mapleview Street								
Ashwood St. to Pino Dr.	4MRITL	34,200	16,228	B	16,949	B	721	No
Lake Jennings Park Road								
Pino Dr. to El Monte Rd.	4MRITL	34,200	14,064	B	14,814	B	749	No
El Monte Rd. to Jack Oak Rd.	4MRITL	34,200	15,227	B	16,192	B	965	No
Jack Oak Rd. to Harritt Rd.	4MRITL	34,200	15,579	B	17,347	B	1,769	No
Harritt Rd. to Blossom Valley Rd.	4MRITL	34,200	18,324	B	20,550	B	2,226	No
Blossom Valley Rd. to I-8 WB Off-Ramp	4MRITL	34,200	25,032	C	28,349	D	3,317	No
I-8 WB Off-Ramp to Olde Highway 80	4MRITL	34,200	23,165	C	28,293	D	5,128	No
Olde Highway 80 to Driveway 4	4MRITL	34,200	2,258	A	3,352	A	1,094	No
Ridge Hill Road								
Lake Jennings Park Rd. to Cordial Rd.	2RR	4,500	2,258	Better than C	2,690	Better than C	432	No
Rios Canyon Road								
South of Olde Highway 80	2LCRS	9,700	4,741	A	5,029	A	288	No

Abbreviations:

4MRITL is a 4 lane Major Road with an Intermittent Turn Lane.

2RR is a 2 lane Residential Road.

2LCRS is a 2 lane Light Collector with a Reduced Shoulder

CHAPTER 6

TRANSIT AND ON-SITE CIRCULATION

6.1 ON-SITE CIRCULATION

The project will have a total of four access points with three access points on Olde Highway 80 and one access point on Ridge Hill Road as described below:

- Project Driveway 1 – A right-in only access located on Olde Highway 80 approximately 200 feet east of Lake Jennings Park Road.
- Project Driveway 2 – The main access to the project site will be a signalized full access, and it is located on Olde Highway 80 approximately 550 feet east of Lake Jennings Park Road. No sight distance issue exists for the main access at Project Driveway 2 is because the horizontal alignment of Olde Highway 80 is straight, and the access is controlled by a traffic signal. A signal warrant analysis was conducted for this location and it meets warrant. This can be found in Appendix I.
- Project Driveway 3 – A right-in/right-out only access located on Olde Highway 80 approximately 750 feet east of Lake Jennings Park Road. A northbound stop sign will be installed at Project Driveway 3.
- Project Driveway 4 – A full access driveway located on Ridge Hill Road approximately 200 feet south of Olde Highway 80. A westbound stop sign will be installed at Project Driveway 4. The westbound driveway approach will align directly with the approaching lanes on Ridge Hill Road for appropriate sight distance and visibility of approach traffic.

6.2 PEDESTRIAN

The existing pedestrian network does not currently provide a continuous sidewalk connecting adjoining land uses along Olde Highway 80, Lake Jennings Park Road and Rio Canyon Road in the study area. The project will provide sidewalk, curb and gutter along the project frontage along Lake Jennings Park Road, Olde Highway 80 and the northerly extension of Rios Canyon Road. The proposed traffic signal and striping improvements at the intersection of Lake Jennings Park Road and Olde Highway 80 will include a crosswalk on the west leg connecting the new sidewalk along the project frontage to the existing sidewalk on the north side of Olde Highway 80. The improved pedestrian network will enhance the pedestrian access for the residential neighborhood located along Rios Canyon Road to utilize the retail and transit opportunities available along Olde Highway 80.

All internal pedestrian networks will be constructed to meet County standards as they relate to pedestrians.

6.3 TRANSIT

Transit service in the study is offered by the San Diego County Metropolitan Transit System (MTS). MTS provides Route 864 along Olde Highway 80, Pecan Park Lane and Lake Jennings Park Road that services the Lakeside Community. The west end of Route 864 is the El Cajon Transit Center and the east end of Route 864 is the Viejas Outlet Center and Viejas Casino. The current westerly segment of Pecan Park Lane between Rios Canyon Road and Olde Highway 80 will be eliminated with the development of the project.

6.4 BICYCLE

Class II on-street bike lanes are currently available on both directions along Olde Highway 80 east of the project site past Pecan Park Lane. No bicycle lanes currently exist along the project frontage on Olde Highway 80 and Lake Jennings Park Road. The project will provide for a standard 8' shoulder serving a bicycle lane with the frontage improvements.

6.5 PARKING

The parking for the project shall be identified on the project plans and will meet DPLU requirements. A total of 389 spaces are being provided on-site.

6.6 DESIGN EXCEPTIONS

A request for exceptions to public road standards was submitted to the Department of Planning and Development Services (PDS) on December 22, 2014. On February 5, 2015 the PDS department released a letter that waived the 300-foot driveway separation requirements of Section 6.1C.2 for the proposed project driveways on Olde Highway 80 along the project frontage. The request was reviewed and supported by the County of San Diego of Public Works Traffic Engineering. Appendix M contains the supporting information.

6.7 INTERSECTION CONTROL EVALUATION (ICE)

Intersection Control Evaluation refers to the process and framework that Caltrans has adopted to provide a more balanced or holistic approach to the consideration and selection of access strategies and concepts during transportation planning, project identification and initiation processes that contemplate the addition, expansion or full control of major intersections (including interchange ramp termini). "Full control" involves the use of signal, stop or yield control (roundabouts) on each of the through and most major movements. The project has conducted the evaluation of intersection control (signal and roundabout) under separate cover and reviewed by Caltrans staff. Final determination of the intersection control at Lake Jennings Park Road and I-8 EB off-ramp will be done through Caltrans Permit review, and is yet to be determined, however, either alternative mitigates the project's direct impact.

CHAPTER 7

CONSTRUCTION TRAFFIC MANAGEMENT

7.1 CONSTRUCTION

It is estimated that the project will require a street closure of Pecan Park Lane (west) during construction phase to make the necessary improvements to Rios Canyon Road and Pecan Park Lane. A construction traffic management plan will be prepared to address the street closure and detours. Construction impacts on the area are projected to be minimal since construction vehicles are estimated to contribute fewer vehicles during the peak hours than the project would after completion. The traffic generated by the dirt haul is also estimated to contribute fewer vehicles during the peak hours than the project would after completion.

During the period of time that Pecan Park Lane (west) is closed and prior to the opening of the Rios Canyon Road extension traffic will be temporarily routed easterly on Old Highway 80 to Pecan Park Lane (east). From this point vehicles can continue to access Rios Canyon Road during the temporary condition. Prior to this temporary detour the applicant will be improving the Pecan Park Lane (east) intersection with Olde Highway 80 to a 90-degree intersection rather than keeping the current, skewed angle in order to provide better safety.

Project construction is expected to take place over approximately 9.5 months with a 5-day, 9-hour work week construction schedule from 7:00 am to 4:00 pm. Construction activity will take place during all available hours for construction as allowed by code. Traffic control plans will be prepared to alleviate any vehicular, pedestrian, transit, bicycle and parking impacts to the extent possible. Contractors will be required to follow the approved control plans to ensure that safe routes throughout the construction zones are provided for all modes of transportations. See Appendix L for traffic control plan.

7.2 PEDESTRIAN

Pedestrian facilities currently do not exist along the project frontage. The existing pedestrian network does not currently provide a continuous sidewalk connecting adjoining land uses along Olde Highway 80. These discontinuous pedestrian facilities are not expected to be impacted by the construction of the project.

7.3 TRANSIT

Transit service is offered by the Metropolitan Transit Service (MTS) bus route 864 along the project frontage. The project does not directly affect the ability of transit to use any of their existing routes or stops. In the event that an existing bus stop is temporarily affected by construction within an existing street right of way that has transit service, the contractor shall coordinate with MTS to temporarily relocate the affected transit stop location.

7.4 BICYCLE

Bicycle lanes and routes are classified on the features provided for them within the right of way. Class II bike lanes are striped in the roadway along the outer edge either near the curb or just outside parking areas. The Class II facilities are the ones that could be affected by construction within the right of way, in the limited number of areas where that occurs for this project. To the extent that any construction activity within the right of way would affect an existing Class II bike lane, the

Contractor shall make provisions for the safe passage of bicyclists through the construction zone as part of the permit process for right of way encroachment with the responsible agency. While recreational riders may be present on many of the back country roads, there are no dedicated bicycle lanes for them and they would follow standard vehicular rules of the road.

7.5 PARKING

Construction workers will park personal vehicles at the project site where adequate parking space will be provided. The anticipated construction activities will not temporarily eliminate any existing parking spaces that would result in parking deficiencies. Heavy equipment will be parked and maintained at construction sites and all utility trucks will park in the construction yards. Therefore, there would be no impact on the public parking inventory associated with the construction of the project since sufficient parking for all employees, visitors, service vehicles, and contractors will be provided and occur on-site during the construction phases of the project.

CHAPTER 8 IMPACTS AND MITIGATION

This chapter identifies significant impacts, project mitigation, and outlines the applicant's TIF contribution.

8.1 SIGNIFICANT IMPACTS

The following intersections and roadway segments were found to be significantly impacted by the proposed project based on the County's significance criteria.

8.1.1 Direct Impacts

Without any improvements by the project, there would be direct impacts for Existing With Project conditions.

8.1.1.1 Roadway Segment Direct Impacts

- Olde Highway 80 from Lake Jennings Park Road to Project Driveway 1
- Olde Highway 80 from Project Driveway 1 to Project Driveway 2
- Olde Highway 80 from Project Driveway 2 to Project Driveway 3
- Olde Highway 80 from Project Driveway 3 to Rios Canyon Road
- Olde Highway 80 from Rios Canyon Road to Pecan Park Lane
- Lake Jennings Park Road from Harritt Road to Blossom Valley Road
- Lake Jennings Park Road from Blossom Valley Road to I-8 Westbound Off-Ramp
- Lake Jennings Park Road from I-8 Westbound Off-Ramp to Olde Highway 80

8.1.1.2 Intersections Direct Impacts

- Lake Jennings Park Road and I-8 Westbound Off-Ramp
- Lake Jennings Park Road and I-8 Eastbound Off-Ramp

8.2.2 Cumulative Impacts

The following segments and intersections have been identified as cumulatively impacted. Table 8-1 identifies the recommended improvements associated in order to bring the LOS grade to an acceptable letter grade.

8.2.2.1 Roadway Segment Cumulative Impacts

- Olde Highway 80 from Lake Jennings Park Road to Project Driveway 1
- Olde Highway 80 from Project Driveway 1 to Project Driveway 2
- Olde Highway 80 from Project Driveway 2 to Project Driveway 3
- Olde Highway 80 from Project Driveway 3 to Rios Canyon Road
- Olde Highway 80 from Rios Canyon Road to Pecan Park Lane
- Lake Jennings Park Road from Jack Oak to Harritt Road
- Lake Jennings Park Road from Harritt Road to Blossom Valley Road
- Lake Jennings Park Road from Blossom Valley Road to I-8 Westbound Off-Ramp
- Lake Jennings Park Road from I-8 Westbound Off-Ramp to Olde Highway 80

8.2.2.2 Intersection Cumulative Impacts

- Lake Jennings Park Road and Blossom Valley Road
- Lake Jennings Park Road and I-8 Westbound Off-Ramp
- Lake Jennings Park Road and I-8 Eastbound Off-Ramp

8.3 MITIGATION

The project would make the fronting improvements along Olde Highway 80 and the off-site improvements proposed for Lake Jennings Park Road between Olde Highway 80 and Harritt Road. The recommended improvements are shown in Appendix D and analysis in Appendix G, and summarized below:

**Table 8-1
Impacts and Mitigation Measures**

Location	Mitigation Measure
Direct Impacts	
Segments	
Olde Highway 80 from Lake Jennings Park Road to Rios Canyon Road	- Improve to provide 4 lanes with intermittent turn lanes between Lake Jennings Park Road and Rios Canyon Road
Olde Highway 80 from Rios Canyon Road to Pecan Park Lane	- Improve to one lane each way with a two-way-left-turn lane between new Rios Canyon Road and Pecan Park Lane (east).
Lake Jennings Park Road from Harritt Road to Blossom Valley Road	- Add NB through lane from Blossom Valley Road to Jennings Vista Drive. - Improve transition from one southbound through lane to two SB through lanes from Harritt Road to Jennings Vista Drive. - Add SB through lane from Jennings Vista Drive to Blossom Valley Road. - Add two way left turn lane south of Harritt Road to Rancho Del Villa - Modify the southbound right turn lane at Blossom Valley to a shared through/right turn lane.
Lake Jennings Park Road from Blossom Valley Road to I-8 westbound off-ramp	- Extend the northbound left turn pocket at Blossom Valley Road to 115 feet. - Improve to provide 4 lanes and bike lanes
Lake Jennings Park Road from I-8 westbound off-ramp to Olde Highway 80	- Improve to provide 4 lanes plus bike lanes - Mitigation strategy/improvement to be reviewed and approved by Caltrans at a later time.
Intersections	
Lake Jennings Park Road and I-8 westbound off-Ramp	-Provide additional capacity at intersection according to segmental improvements above -Provide southbound refuge lane for the westbound left turn lane movement from the I-8 westbound off-ramp. - Mitigation strategy/improvement to be reviewed and approved by Caltrans at a later time.
Lake Jennings Park Road and I-8 eastbound off-Ramp	- Install traffic signal at intersection (Signal Warrant provided in Appendix I) and widen off-ramp for 320 ft to have a third lane to accommodate a left turn lane, a left through lane and a through right lane; however, mitigation strategy/improvement to be reviewed and approved by Caltrans consistent with I.C.E. policy.
Olde Highway 80 and Project Driveway #2	- Install a traffic signal at the intersection opposite the proposed Tractor Supply project (Signal Warrant provided in Appendix I).
Cumulative Impacts	
Segments	
Lake Jennings Park Road from Jack Oak Road to Harritt Road	- No improvement is proposed in this area given the discussion of traffic operations in the text and the other improvements being offered along Lake Jennings Park Road.
Intersections	
Lake Jennings Park Road and Blossom Valley Road	- Expand Lake Jennings Park Rd from a 2 lane CC to a 4 lane Major Rd

All of the impacted roadway segments and intersections would be mitigated to avoid the direct impacts with the recommended roadway improvements.

The segment of Lake Jennings Park Road from Jack Oak Road to Harritt Road, will experience LOS E for Cumulative With Project conditions; however, this portion of roadway does not really conform to the normal list of facilities given the availability of a climbing lane southbound and southerly from El Monte Road, and the practical capacity is indeed something greater than the values used in the tables for

making our assessment of adequacy. Also, as demonstrated by the intersection analysis along this portion of Lake Jennings Park Road it will be operating acceptably (LOS = A-C) despite this LOS anomaly when compared to the normal acceptable daily volumes. Therefore, the improvements being proposed by the applicant to that portion of Lake Jennings Park Road between Harritt Road and Olde Highway 80 constitutes a substantial proportional contribution to the project's effects throughout this area.

8.4 TIF UPDATE

The County may also condition the project applicant to fund an update of the TIF program to help underwrite the cost of reflecting new, non-conformal projects in the updated fee program which would result in a new cost formulation for the TIF payment that the project would be subject to.

CHAPTER 9 RECOMMENDATIONS

The proposed development consists of 76,100 square feet of neighborhood commercial uses including an auto fueling facility of 12 fueling positions. Based on the preceding analysis of this project we recommend the mitigation measures and fair share contributions described in Chapter 8.

Prepared By:

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APPENDIX A

**LEVEL OF SERVICE CONCEPTS,
ANALYSIS METHODOLOGIES, STANDARDS OF SIGNIFICANCE**

Roadway Segment Level of Service Definitions

LOS	V/C	Congestion/Delay	Traffic Description
(Used for surface streets, freeways, expressways and conventional highways)			
"A"	≤0.41	None	Free flow.
"B"	>0.41-0.62	None	Free to stable flow, light to moderate volumes.
"C"	>0.62-0.80	None to minimal	Stable flow, moderate volumes, freedom to maneuver noticeably restricted.
"D"	>0.80-0.92	Minimal to substantial	Approaches unstable flow, heavy volumes, very limited freedom to maneuver.
"E"	>0.92-1.00	Significant	Extremely unstable flow, maneuverability and psychological comfort extremely poor.
(Used for surface streets and conventional highways)			
"F"	>1.00	Considerable	Forced or breakdown flow. Delay measured in average travel speed (MPH). Signalized segments experience delays >60.0 seconds/vehicle.
(Used for freeways and expressways)			
"F(0)"	>1.00-1.25	Considerable 0-1 hour delay	Forced flow, heavy congestion, long queues form behind breakdown points, stop and go.
"F(1)"	>1.25-1.35	Severe 1-2 hour delay	Very heavy congestion, very long queues.
"F(2)"	>1.35-1.45	Very Severe 2-3 hour delay	Extremely heavy congestion, longer queues, more numerous breakdown points, longer stop periods.
"F(3)"	>1.45	Extremely Severe 3+ hours of delay	Gridlock

Source: Caltrans, 1992.

LEVEL OF SERVICE (LOS) DEFINITIONS

The concept of LOS is defined as a qualitative measure describing operational conditions within a traffic stream, and the motorist's and/or passengers' perception of operations. A LOS definition generally describes these conditions in terms of such factors as speed, travel time, freedom to maneuver, comfort, convenience, and safety. Levels of service for freeway segments can generally be categorized as shown in the table above.

San Diego County Roadway Classifications, Levels of Service (LOS) and
Average Daily Traffic (ADT)

Street Classification	Lanes	Maximum Recommended ADT by LOS				
		A Free flow	B Steady flow	C Stable flow	D Approach unstable	E Unstable flow
Expressway	6	36,000	54,000	70,000	86,000	108,000
Prime	6	22,200	37,000	44,600	50,000	57,000
Major	4	14,800	24,700	29,600	33,400	37,000
Collector	4	13,700	22,800	27,400	30,800	34,200
Town Collector	2	3,000	6,000	9,500	13,500	19,000
Collector	2	1,900	4,100	7,100	10,900	16,200
State Route ¹	2			14,400	16,200	22,900
State Route w/LTL ²	2			17,000	18,800	25,500

¹ Refer to Guidelines for Determining Significance: Section 4.3.1 (Table 3) Signalized Intersection Spacing Over One Mile for LOS Criteria

² The capacity of the 2SR w/ LTL is determined by adding the additional capacity of a collector series road with left turn lanes to the State Route base capacity.

Signalized Intersection Level of Service Highway Capacity Manual Operational Analysis Method

The operational analysis method for evaluation of signalized intersections presented in the *2000 Highway Capacity Manual* (Transportation Research Board Special Report 209) defines level of service in terms of delay, or more specifically, control stopped delay per vehicle. Delay is a measure of driver and/or passenger discomfort, frustration, fuel consumption, and lost travel time.

Control Stopped Delay Per Vehicle (seconds)	Level of Service (LOS) Characteristics
<10	LOS A describes operations with very low delay. This occurs when progression is extremely favorable, and most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
>10 – 20	LOS B describes operations with generally good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.
>20 – 35	LOS C describes operations with higher delays, which may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
>35 – 55	LOS D describes operations with high delay, resulting from some combination of unfavorable progression, long cycle lengths, or high volumes. The influence of congestion becomes more noticeable, and individual cycle failures are noticeable.
>55 – 80	LOS E is considered to be the limit of acceptable delay. Individual cycle failures are frequent occurrences.
>80	LOS F describes a condition of excessively high delay, considered unacceptable to most drivers. This condition often occurs when arrival flow rates exceed the capacity of the intersection. Poor progression and long cycle lengths may also be major contributing causes to such delay.

Source: Highway Capacity Manual 2000, Exhibit 16-2