Traffic Impact Analysis & Traffic Signal Design
TranSummit – Transportation Team 5

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Project Description
TranSummit in conjunction with RK Engineering Group has been tasked to conduct a traffic impact study and design the traffic signals for a future mixed-use development in Aliso Viejo, CA. Existing traffic conditions were analyzed to project future traffic impacts. Following the study, possible mitigation measures will be recommended to achieve the best Level of Service.

Design Approach
• Site plan includes: a coffee shop, a quality restaurant, a sit-down restaurant, general office space, assorted retail space, and sufficient parking (determined by Aliso Viejo Municipal Code and ADA Manual)
• Design alternative site plans
• Use ITE Trip Generation Manual to develop project trip generation
• Base trip distributions on surrounding land use
• Model the roadway network in Traffix to determine the Level of Service (LOS) of the study intersections with and without the project traffic volumes

Existing Conditions

Design Constraints and Parameters
• Site is separated into two sections due to an elevation difference of 35 feet
• Project site area is approximately four acres
• Locate Starbucks on Enterprise for increased visibility
• Restricted to right-in/right-out access due to existing medians
• Minimum acceptable Level of Service is C
• Provide a sufficient parking supply for site land usage

Trip Distribution

Trip Generation Table

<table>
<thead>
<tr>
<th>Land Use</th>
<th>ITE Code1</th>
<th>Quantity (TPF)</th>
<th>AM In</th>
<th>AM Out</th>
<th>PM In</th>
<th>PM Out</th>
<th>Total</th>
<th>Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coffee Shop with Drive-Thru*</td>
<td>937</td>
<td>2.5</td>
<td>65</td>
<td>62</td>
<td>127</td>
<td>27</td>
<td>54</td>
<td>1024</td>
</tr>
<tr>
<td>General Office Building</td>
<td>710</td>
<td>28.0</td>
<td>39</td>
<td>46</td>
<td>5</td>
<td>35</td>
<td>42</td>
<td>309</td>
</tr>
<tr>
<td>Quality Restaurant</td>
<td>931</td>
<td>7.0</td>
<td>5</td>
<td>3</td>
<td>8</td>
<td>36</td>
<td>18</td>
<td>54</td>
</tr>
<tr>
<td>High-Turnover (Sit-Down) Restaurant*</td>
<td>932</td>
<td>7.0</td>
<td>34</td>
<td>28</td>
<td>62</td>
<td>34</td>
<td>22</td>
<td>56</td>
</tr>
<tr>
<td>Shopping Center</td>
<td>820</td>
<td>14.0</td>
<td>9</td>
<td>6</td>
<td>15</td>
<td>25</td>
<td>28</td>
<td>53</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>58.5</strong></td>
<td></td>
<td><strong>152</strong></td>
<td><strong>105</strong></td>
<td><strong>257</strong></td>
<td><strong>129</strong></td>
<td><strong>130</strong></td>
<td><strong>259</strong></td>
</tr>
</tbody>
</table>

2 TPF = Thousand Square Feet
*Applied: 50% reduction to Coffee Shop with Drive-Thru and 30% reduction to High-Turnover (Sit-Down) Restaurant

Alternative
The alternative does not include office space or a retail establishment. It was disregarded in order to:
• Maximize parking utilization by increasing land usage
• Add land use diversity
• Minimize traffic impact with mixed-use development
• Increase number of revenue-producing businesses

Figure 3. Site Plan
Figure 4. Alternative Site Plan

Project Tasks
Completed/In-Progress:
• Site visit/Analysis of existing road geometrics & configurations
• Determination of Trip Generation Rates & Trip Distributions
• Starbucks Parking Study & Queuing Analysis
• Determination of Parking Requirements
• Calculate existing Level of Service at local intersections
• Development and finalization of Site Plan
• Determine future project traffic impacts

Remaining (Estimated completion date - June 2015):
• Determine mitigation measures
• Review on-site circulation and access
• Traffic Signal Design

Group Picture
Figure 7, left to right: P. Johnson, E. Sy Su, J. Narciso, A. Bensa, B. Elenes, S. Kevorkian

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Figure 2. Lower Faid (Eastern Section)
Figure 3. Upper Faid (Western Section)

Figure 5. Inbound Trip Distribution
Figure 6. Traffic Network Model

Figure 8. Traffic Signal Design

Colors