TOPICAL RESPONSE NO. 10: VEHICLE TRIP DISTRIBUTION METHODOLOGY

The traffic study conducted for the Draft EIS/EIR determined that the proposed Project (Alternative 2) would result in an internal daily capture rate of 47 percent. (See Draft EIS/EIR, **Section 4.8**, **Figure 4.8-12**, Project Distribution Patterns; **Appendix 4.8**, Newhall Ranch RMDP and SCP EIR/EIS Traffic Analysis (2008 Traffic Analysis), Figure 11.) The internal capture rate is the percentage of total daily vehicle "tripends" generated by the Project that are attributable to those trips beginning and ending on the Project site. Several comment letters raised concerns that the proposed Project's internal capture rate is overstated. Several comment letters also suggested the average vehicle trip lengths assumed in the Draft EIS/EIR are understated. This response addresses those concerns and clarifies the data used and the analysis conducted in the traffic study for the Draft EIS/EIR. In addition, for further responsive information, please see revised **Section 4.8** of the Final EIS/EIR.

As explained in detail below, the internal capture rate and average trip lengths reported in the Draft EIS/EIR were derived using the Santa Clarita Valley Consolidated Traffic Model (SCVCTM), a computerized travel demand model in which future land uses in an area are quantified and corresponding traffic volumes are estimated based on standardized modeling techniques. The only variables in the model that are modified for purposes of the analysis are the Project land uses and the future roadway network assumptions, which are input into the model with the oversight of City of Santa Clarita (City) and County of Los Angeles (County) transportation engineering staff.

A detailed explanation of the SCVCTM and the methodology utilized to determine the internal capture rate and average trip lengths is provided below.

Santa Clarita Valley Consolidated Traffic Model

The trip distribution patterns utilized in the Draft EIS/EIR for the Santa Clarita Valley, and the corresponding internal capture rates, were determined based on application of the SCVCTM. (Draft EIS/EIR, **Subsection 4.8.2.2**.) The SCVCTM is a computerized travel demand model that utilizes a sophisticated trip distribution function to derive geographically defined travel patterns from zonal trip generation estimates calibrated according to local conditions. (County of Los Angeles Department of Public Works (DPW; in association with City), Santa Clarita Valley Consolidated Traffic Model 2004 Update and Validation (March 2005) (SCVCTM Report)). A copy of the SCVCTM Report is included in the Final EIS/EIR, **Appendix F4.8**. Detailed land use data regarding the availability of housing, employment, shopping, schools, and recreation opportunities have been input into the base SCVCTM, which derives trip distribution patterns and related trip lengths based on mathematical functions that consider the amount of trips generated on a zone-by-zone basis, the type of trips generated, and the geographic relationship between these trips and the remainder of trips generated in the modeled area. (SCVCTM Report, Section 2.4, Trip Distribution, **Appendix F4.8**.)

The SCVCTM is jointly maintained by the City and the County. Any inputs into the model beyond the base data are conducted with the oversight of City and County transportation engineering staff. Moreover, the only data input into the model by the EIS/EIR traffic engineer were the Project land uses (*i.e.*, details relevant to the specific proposed land uses that ultimately would be facilitated in each traffic analysis zone) and the future roadway network assumptions. The trip distribution process then utilizes a statistical probability formula to calculate the interchange of trips between traffic analysis zones; use of this distribution formula is standard practice throughout the traffic engineering industry. The formula is

based upon established behavioral tendencies of travelers and postulates the trip interchange between zones as being directly proportional to the relative attraction of each of the zones and inversely proportional to a function of the spatial separation of the zones. Based on the formula, the SCVCTM determines the percentage distribution of internal/external trips and numerically assigns those trips to the area roadways.

The SCVCTM trip distribution calculations are prepared using distribution functions that have been calibrated to real-world conditions and are based on the trip distribution functions used by the Southern California Association of Governments (SCAG) for regional traffic modeling efforts. As such, the trip distribution patterns reported in the proposed Project's traffic study were not "assumed," but were derived by a systematic methodology consistent with other traffic studies, including the joint County of Los Angeles/City of Santa Clarita One Valley One Vision General Plan update currently underway.

Internal/External Project Trips

The model-derived internal capture rate represents the overall percentage of tripends generated by the proposed Project that are attributable to those trips that begin and end within the proposed Project site. A tripend is the beginning or ending of a trip. For example, a trip from home to work has two tripends. By contrast, a "trip" refers to the journey between the origin tripend and the destination tripend. Thus, a journey from home to work has two tripends, but constitutes only one trip. Notably, the internal capture rate includes not only trips to and from work, but also trips to and from school, shopping, entertainment, recreation, *etc.* Thus, the overall internal capture rate for the proposed Project reflects numerous non work-related trips.

Here, as shown below on **Table 1**, Alternative 2 Tripend and Trip Summary, the SCVCTM determined that 47 percent of the total Project tripends (192,633/408,718) would be internal, and 53 percent (216,085/408,718) would be external. (See also Draft EIS/EIR, **Figure 4.8-12**, Project Distribution Patterns, depicting that 47 percent of Project traffic would remain within the Project area.)[1] As explained below, the percentage of internal work-related trips is relatively low compared to the internal non-work-related trips.

Table 1
Alternative 2 (Proposed Project) Tripend and Trip Summary

Trip Type	Project Tripends	Percent of Total Project Tripends	Project Trips	Percent of Total Project Trips
Internal	192,632	47%[2]	96,316	31%
External	216,086	53%	216,086	69%
Total	408,718[1]	100%	312,402	100%

[1] Draft EIS/EIR **Appendix 4.8**, 2008 Traffic Analysis, p. A-6 (Alternative 2 total ADT).

[2] Draft EIS/EIR **Appendix 4.8**, 2008 Traffic Analysis, p. 22 (Alternative 2 internal capture percentage).

Notes:

Each internal Project trip consists of two internal Project tripends (1 Project trip = 2 Project tripends).

Each external Project trip consists of one internal Project tripend and 1 external tripend (1 Project trip = 1 Project tripend).

[1] While the 47 percent internal capture rate reported in **Figure 4.8-12** of the Draft EIS/EIR is correct, some of the other information included on the figure is incorrect. A corrected **Figure 4.8-12** is included in the Final EIS/EIR.

Importantly, as noted above, the 47 percent of total project tripends represents the *overall* internal capture rate for the proposed Project, which includes three separate trip types or trip purposes: (i) Home-Based Work Trips (*i.e.*, trips between home and work); (ii) Home-Based Other Trips (*i.e.*, trips between home and non-work destinations, such as schools, stores and restaurants); and (iii) Non-Home-Based Trips (*i.e.*, trips between one non-home location and another, such as a trip from a store to a restaurant).

Table 2, Alternative 2 Internal/External Daily Tripend Summary, shown below, summarizes the internal and external tripends that would be generated under Alternative 2 (the proposed Project) by the three trip purposes (Home-Based-Work; Home-Based-Other; Non-Home-Based) relative to the three fundamental land use trip generator categories summarized in the Draft EIS/EIR traffic impacts analysis -- Residential, Non-Residential, and Schools/Parks. As shown in **Table 2**, of the Residential Home-Based-Work Trips, only 22 percent of the Project's tripends were estimated to be for internal trips (meaning the trip would start and end on the Project site), whereas the remaining 78 percent were estimated to be for external trips, with one tripend on-site and the other off-site. Thus, the SCVCTM determined that less than 25 percent of the Project's tripends for Residential Home-Based-Work Trips would be internal to the Project. With respect to the 78 percent of the Project's Residential Home-Based-Work tripends attributable to external trips, a portion of these trips likely would remain local due to existing and planned future employment opportunities within the Santa Clarita Valley. (See Draft EIS/EIR, **Subsection 4.8.6.2**, Trip Distribution.) As to the remainder, as shown on Draft EIS/EIR, **Figure 4.8-12**, Project Distribution Patterns, approximately ten percent of total Project traffic were estimated to utilize I-5 for travel to and from the Santa Clarita Valley, with a portion of that traffic commuting to employment centers both south and north of the Project site. (See Draft EIS/EIR, **Figure 4.8-12**.)

Further, 55 percent of the Project's tripends for Residential Home-Based Other Trips were estimated to remain internal, and 45 percent were estimated to be external. In other words, more than half of the tripends for trips from home to schools, shopping and entertainment would be internal. Additionally, 45 percent of the Project's tripends for Residential Non-Home Based Trips were estimated to be internal, whereas 55 percent were estimated to be external. These percentages are consistent with the Alternative 2 land use plan, which, in addition to including approximately 22,000 residential units, also would include 9.4 million square feet of non-residential uses that would provide retail, entertainment, and employment opportunities for Project residents on the Project site. (Draft EIS/EIR, p. 4.8-29.)

Table 2
Alternative 2 (Proposed Project) Internal/External Daily Tripend Summary

	Residential	Non-Residential	Schools/Parks	Total
Home-Based-Work Trips[3]				
Internal	9,209 (22%)	8,879 (26%)	330 (25%)	18,418 (24%)
External	32,460 (78%)	25,404 (74%)	979 (75%)	58,843 (76%)
Home-Based-Other Trips[4]				
Internal	59,858 (55%)	29,464 (59%)	9,252 (86%)	98,574 (58%)
External	49,888 (45%)	20,475 (41%)	1,510 (14%)	71,874 (42%)
Non-Home-Based Trips[5]				
Internal	21,485 (45%)	53,224 (48%)	932 (65%)	75,640 (47%)
External	26,049 (55%)	58,826 (52%)	494 (35%)	85,370 (53%)
Total Daily Tripends				
Internal	90,552 (46%)	91,567 (47%)	10,514 (78%)	192,633 (47%)[1]
External	108,397 (54%)	104,705 (53%)	2,983 (22%)	216,085 (53%)
Total	198,949	196,272	13,497	408,718[2]

[1] Draft EIS/EIR, **Appendix 4.8**, 2008 Traffic Analysis, p. 22 (Alternative 2 internal capture percentage).

[2] Draft EIS/EIR, **Appendix 4.8**, 2008 Traffic Analysis, p. A-6 (Alternative 2 total ADT).

[3] Home-Based Work Trips are trips between home and work.

[4] Home-Based Other Trips are trips between home and non-work destinations, such as schools, stores and restaurants.

[5] Non-Home-Based Trips are trips between one non-home location and another, such as a trip from a store to a restaurant.

Notably, the 47 percent internal capture rate is the percentage of total Project *tripends* that would be internal to the Project, not the total number of Project trips. As shown on **Table 1**, Alternative 2 Tripend and Trip Summary, the total number of internal trips represents 31 percent of the total Project trips (96,316/312,402). As explained above, total "trips" refers to the number of vehicle trips generated by the Project. Total "tripends" is the number of starting and ending points generated by the Project, whereby each trip has two tripends. An internal Project trip counts as two Project tripends because both tripends are on the Project site. An external trip, on the other hand, also counts as one Project trip but with only one Project tripend within the Project site. Thus, in cases in which there are internal trips, such as the proposed Project, the number of Project trips does not equal the number of Project tripends.

As noted above, some comment letters have suggested that 47 percent is an overestimate of the internal capture rate. However, internal capture is a function of many variables, including the varying mix of land uses and the quantity of such land uses on site. Additional factors include jobs/housing balance, the amount of service-related commercial uses on site, and the scope and size of the project.

In this case, the proposed Project would result in development of a substantial amount of residential and non-residential land uses, such that Alternative 2 could provide for many needs on site. This is illustrated by the nearly equal amount of trip productions (215,168) and attractions (193,550) that would result under the proposed Project. (Each Project trip has a trip production land use and a trip attraction land use. See Final EIS/EIR, **Appendix F4.8**, Additional Trip Generation Tables**, Table 3**, Alternative 2 Production & Attraction Trip Generation Summary.) Thus, the SCVCTM determined that there will be an almost equivalent number of land uses under Alternative 2 that would attract trips as there will be those that would produce trips. The calibrated SCVCTM takes into account the surrounding land uses, as well as the on-site uses, and derives the distribution patterns accordingly, in this case resulting in a 47 percent internal capture rate based on tripends, and a 31 percent internal capture rate based on trips.

The letter from the Center for Biological Diversity, dated August 25, 2009 (Letter 051, Comment 5) further states that "[e]xperts have found a maximum internal home-work capture rate of 38 percent in isolated developments. This means that at least 62 percent of all other home-work trips are external to the development." (See Comment 5 in Letter 051, authored by Center for Biological Diversity, dated August 25, 2009.) As noted above, the 47 percent rate the SCVCTM derived for the proposed Project is an overall rate of internal tripend capture that includes home-to-work, home-to-non- work, and non-home-based trips. As shown on **Table 2**, Alternative 2 Internal/External Trip Generation Summary, and as noted above, the residential home-work internal tripend capture for the Project is only 22 percent, which is substantially below the referenced 38 percent. As previously discussed, the higher overall internal capture rate for the Project is due to the fact that a large number of internal trips would be non-work-related. Additionally, there is no evidence that the 38 percent ceiling on capture rates referenced in the comment would apply to the proposed Project; the 38 percent applies to "isolated" developments, which does not accurately characterize the location of the development that would be facilitated by the proposed Project. (See, *e.g.*, Draft EIS/EIR, **Figure 4.8-11**, Employment Centers and Colleges Surrounding the Project Site.)

The comment letter further states that "[t]he EIR also fails to recognize that commercial and maintenance jobs at the Project site will attract workers who do not live there and must commute. These assumptions have no basis in reality and serve to grossly understate Project impacts." However, the trip generation rates and applicable trip distribution patterns fully account for and consider workers who would commute from off-site (*i.e.*, external trips). As shown on **Table 2**, 74 percent of the Project's tripends for Home-Based-Work Trips to the proposed Project's non-residential uses would be external (*i.e.*, from a starting point outside of the Project). Therefore, the SCVCTM determined that over 70 percent of the people that would be working on the Project site would come from outside of the Project.

Average Trip Lengths

Related to internal capture, some comment letters question the average trip lengths derived by the SCVCTM and utilized in the Draft EIS/EIR for home-work, home-shop, and home-other trips of 10.7 miles, 5.2 miles, and 7.0 miles, respectively. The trip length estimates derived by the SCVCTM are consistent with the SCAG regional model, which is generally recognized as the primary source for trip distribution functions in the Southern California region. This travel demand model takes into account both the Project's mix of land uses and the land uses of the surrounding area. The related trip lengths are calculated by the SCVCTM based on the calibrated trip distribution functions.

The 2003 SCAG travel demand model validation report identifies an average home-based-work trip length of 13.67 miles for the SCAG modeling region, and an average home-based-work trip length of 12.48 miles for the Los Angeles region. (SCAG 2003 Model Validation and Summary: Regional Transportation Model (January 2008), Table 5-7. A copy of Table 5-7 is included in the Final EIS/EIR, **Appendix F4.8**. The full SCAG report is available for review at http://www.scag.ca.gov/modeling/index.htm.) The SCVCTM estimates an average home-based-work trip length of 10.7 miles for the Project area, and 16.6 miles for the portion of the Santa Clarita Valley outside of the Project area. Thus, the trip length estimates derived by the SCVCTM are consistent with the SCAG regional model since the SCAG model estimates an average home-based-work trip length of 12.48 miles for the Los Angeles region, and the SCVCTM estimates average home-based-work trip lengths of 10.7 to 16.6 miles for the Santa Clarita Valley.

The shorter trip lengths derived by the SCVCTM for the Project area is a direct result of the Alternative 2 land use plans, which include 9.4 million square feet of non-residential uses that will provide employment, retail, and entertainment opportunities for the approximately 22,000 residential units that would be built. (Draft EIS/EIR, p. 4.8-29.) As a result, approximately 47 percent of the Project tripends will be for internal trips (trips starting and ending on-site), which has the effect of lowering the average vehicle trip lengths for the Project area. In considering the Project's average trip lengths, Project trips to the existing (*i.e.*, already built) portion of the Valencia Commerce Center (VCC) were considered off the Project site and, therefore, external trips. Trips such as these further contribute to shorter average trip lengths.