



TECHNICAL MEMORANDUM

Date: Updated February 16, 2017

To: Nicole Morse, Placeworks

From: Jason D. Pack, P.E.

Subject: Vehicle Miles Traveled (VMT) for The SEASP Project

Fehr & Peers completed our efforts to assist in quantifying vehicle miles of travel (VMT) for the SEASP project (Project) in Long Beach, California. Our work to quantify VMT and VMT reductions for SEASP included use of the SCAG forecasting model, use of the U.S. Environmental Protection Agency (EPA) mixed-use development (MXD) trip generation methodology to accurately estimate project trip internalization based on land use mix and accessibility, and assistance in identifying appropriate transportation demand management (TDM) approaches for the Project, and quantification of VMT reductions associated with those TDM strategies.

The purpose of this memorandum is to document our VMT estimates and reductions for the SEASP project.

The remainder of this memorandum is divided into three sections. First, we report our methodology for estimating VMT. Next, we identify the TDM measures that are proposed for the SEASP project and outline the VMT reductions associated with those measures. Finally, we summarize an accounting approach to potentially require additional TDM to be implemented with development projects.

Please note that this VMT estimation updates our work completed last year on this project. Specifically, we have updated it to include VMT reduction estimates associated with the newly developed TDM program we developed for this area last month.

Initial VMT Estimates

To estimate initial (e.g. non-TDM adjusted) VMT for the project, we utilized a three-step approach. First we utilized the SCAG regional travel demand model (2012 Regional Transportation Plan



model), for both the base year and the future year to estimate VMT by trip purpose for both trip attractions and for trip productions. Next, we utilized the MXD model to estimate trip generation and trip internalization associated with the proposed project. These were combined with the average trip length information to estimate VMT generations.

To estimate trip length, we utilized the SCAG model that was developed for the 2012 Regional Transportation Plan. Specifically, we used both the base year and future year models to extract actual trip length by trip purpose for the traffic analysis zones representing SEASP. Specifically, we used the model's congested network assignment skim matrices to derive trip length by trip purpose (e.g. home base work (HBW), home base other (HBO), and non-home based (NHB)) for both trips that are attractions and trips that are productions. It should be noted that, approaching trip length in this way provides trip length information that is compatible with the mixed-use trip generation model and provides a full-accounting methodology for VMT estimation (e.g. it incorporates the entire length of the trip). The trip length information by trip purpose for both productions and attractions is summarized below:

Trip Length Information:

- Existing
 - Productions (length by trip purpose):
 - HBW – 14.6 miles
 - HBO – 8.4 miles
 - NHB – 7.3 miles
 - Attractions (length by trip purpose):
 - HBW – 13.2 miles
 - HBO – 8.8 miles
 - NHB – 8.0 miles
- Future Year with Project
 - Productions (length by trip purpose):
 - HBW – 15.8 miles
 - HBO – 8.9 miles
 - NHB – 7.0 miles
 - Attractions (length by trip purpose):
 - HBW – 12.3 miles
 - HBO – 8.4 miles



- NHB – 7.0 miles

It should also be noted that the traffic study did not incorporate land use for the industrial use in the area given the projected decrease in industrial employment anticipated with the plan. However, for this assessment, the industrial employment has been incorporated into the trip generation, internalization, and VMT assessment.

Using the trip generation and trip length information provided above, the resulting VMT was calculated for the project site:

Initial VMT Estimates:

- Existing – 455,236 VMT per day (includes VMT reduction associated with internalization and the D variables)
- Future Year with Project – 760,280 VMT per day (includes VMT reduction associated with internalization and the D variables)

Using the information above, we were able to estimate VMT per service population, as noted below. Service population represents residential population plus employment in the study area. Employment and population numbers were provided by Placeworks as part of the project description.

VMT Estimates per Service Population:

- Existing – 45.34 VMT per day per service population
- Future Year with Project – 39.50 VMT per day per service population

As shown above, with future buildout of the project, VMT per day in the region is expected to increase relative to the existing VMT generated in the area. It should also be noted that the existing VMT did account for existing trip internalization in the SEASP area. However, with future buildout of the project, the VMT per service population is anticipated to decrease by 13% with the project.

Active Transportation VMT Reductions

In addition to the internalization and trip length information utilized above, specific features of the project will also assist in decreasing VMT. These are referred to as transportation demand management (TDM) measures.



The proposed project incorporates robust improvements to the pedestrian and bicycle network, which has the potential to convert mode share away from the vehicle (which is not reflected in the methodology described above). To account for pedestrian and bicycle activity, we utilized the California Air Pollution Control Officers Association (CAPCOA) methodology, which is considered the standard approach to analyzing VMT reductions for bicycles and pedestrians.

The project will offer pedestrian sidewalks on both sides of most streets, providing connections within the site and off-site. The SEASP will also offer traffic calming measures on the streets and intersections in the project site. Using the CAPCOA methodology, these inputs result in a 2.5% VMT reduction due to increased active transportation. The project will also offer an increase in bicycle lanes throughout the project site. CAPCOA specifies that for each increase in bicycle lane mile, an additional 1% of mode share can be accomplished. With all the pedestrian and bicycle facilities in the SEASP, the total active transportation VMT reduction of 7.4% was identified.

Adjusting the VMT numbers above, resulted in the following total VMT estimates AFTER accounting for these active transportation ATP measures:

ATP -Adjusted VMT Estimates:

- Existing – 455,236 VMT per day
- Future Year with Project – 704,019 VMT per day

ATP -Adjusted VMT Estimates per Service Population:

- Existing – 45.34 VMT per day per service population
- Future Year with Project – 36.57 VMT per day per service population

Additional TDM VMT Reductions

Additional measures could be implemented that would further reduce VMT associated with the project. Currently, the measures described above account for built environment variables (such as regional accessibility, density of development, development scale, proximity to transit, etc.) and design of the site (e.g. block density, presence of sidewalks and bicycle facilities, etc.). These built environment variables are commonly referred as the D variables. However, additional TDM measures can be implemented that would further reduce VMT associated with the SEASP project.

As requested by City staff, Fehr & Peers developed a robust TDM program that could be



implemented as part of the SEASP project. That program was summarized in a memorandum dated January 31, 2017. These strategies were divided into residential strategies and employment strategies as noted below:

Residential Strategies:

- Unbundled Parking
- Vanpool/Carpool
- Safe Routes to School Programs
- Smart Trips Programs

Employer Strategies:

- TAP Card or OCTA Pass
- Transit Subsidies
- Unbundled Parking
- Shared Parking
- Employee Parking Cash-Out
- Alternative Work Schedules
- Car Share
- Vanpool/Carpool
- Circulator Shuttle
- Guaranteed Ride Home Program
- Commute Trip Reduction (CTR) Program

Please note that all of these strategies are in addition to the built environment variables (such as density, diversity, and regional accessibility noted above) and the active transportation network variables noted above.

Fehr & Peers utilized the CAPCOA guidance to estimate the additional VMT reductions associated with implementing the TDM measures noted above. The CAPCOA guidance estimates full implementation of these measures to achieve a total TDM reduction of approximately 11%. This is 1% more reduction than the 10% goal identified in the TDM memorandum submitted last month.

Applying an additional 10% reduction to the adjusted numbers above indicates that the SEASP project resulted in the following final TDM-adjusted VMT estimates:



TDM -Adjusted VMT Estimates:

- Existing – 455,236 VMT per day
- Future Year with Project – 633,617 VMT per day

TDM -Adjusted VMT Estimates per Service Population:

- Existing – 45.34 VMT per day per service population
- Future Year with Project – 32.91 VMT per day per service population

Comparing the existing VMT per service population to the future year with project VMT per service population identifies a total VMT reduction of approximately 27%.

Please note that the 27% reduction noted above is relative to the current VMT reduction that already occurs in the SEASP area. The current VMT reductions are due to the built environment variables and represent a reduction of 13% relative to VMT that would otherwise be generated if no trip internalization would occur. Given the internalization estimate of approximately 13% per day reflected in the D variables associated with the initial VMT estimation for existing uses in the area, the project would achieve a total VMT reduction of approximately 40% relative to existing conditions if no D variables were accounted for (e.g. if no trip internalization is accounted for in the VMT estimates). This is consistent with maximum VMT reductions noted for compact infill developments like the SEASP area, where research shows the maximum VMT reductions to be approximately 40%.

As such, implementation of the SEASP project, (including the D variables reflected in the internalization estimates, the active transportation reductions, and full implementation of the identified TDM program) would “max out” the VMT reduction potential associated with the project. Although the identified goals in the TDM memorandum are aggressive and comprehensive, they do represent the maximum achievable reduction potential for this specific area.

We hope this information is helpful. If you have any questions or concerns, please do not hesitate to contact us at 714-941-8800.