

1. How would you explain to the community why Culver City needs a model in layman's terms?

For many years transportation network and land uses have been planned predominantly around the automobile and needs of drivers. Many Cities have been updating their policies to be more multi modal focused with an emphasis on complete streets to address the needs of the traveling public. Statewide policy is also changing and new environmental guidelines are in the process of being adopted.

It has become clear that the development of a state of the art travel demand model is necessary to measure the effectiveness and impacts of the land use and transportation policies in Culver City. In order to achieve this, the model capabilities must go beyond that of traditional highway focused travel demand models to provide enhanced capabilities in areas such as: smart growth, greenhouse gas emissions, and alternative modes of transportations, for instance transit, bicycling and walking.

There are a number of potential travel demand forecasting model applications that could benefit the residents and businesses in the City of Culver City, including:

- Measuring the mobility and operational implications of different land use scenarios (such as the General Plan);
- Design of transportation systems and multi modal planning;
- Assessing climate change and greenhouse gas impacts (air quality analysis);
- Assessing the effectiveness of travel demand management (TDM) strategies and related programs;
- Measuring the impact of urban form changes on travel behavior;
- Measuring and projecting vehicle miles traveled (VMT) for environmental analysis; and
- Providing a basis for more refined project development review.

To meet these and other needs, the City of Culver City will require a travel demand model with a number of advanced features, which must pass stringent validation and calibration standards/tests along with being transparent in nature, so that the tool can withstand the test of legal defensibility.

2. How would you explain to the community how the City will use the model to review developers' traffic studies in layman's terms?

The key question to address with new private development is what scale and type of project should be evaluated using a travel demand model versus a project scale tool. An important point to consider is that travel demand forecasting should not be considered "a stand-alone product", rather as an input for other technical studies. In order to understand how land use development can impact the transportation system, the model must contain the sensitivity to answer many technical questions that involve complex land use interactions being asked today.

The models that we develop are able to respond to challenging technical questions involving complex issues such as quantifying the benefits of smart growth concepts and GHG reduction plans. These types of travel models are very effective at capturing the interactions between neighborhood scale land use characteristics and travel patterns.

With respect to how the model could be used to help the City review developer's traffic studies, there are a number of technical examples:

- Trip Distribution Patterns – Does the traffic study have a reasonable assessment of how vehicular traffic travels to/from the project and through nearby intersections?
- Trip generation estimates – Is the project under predicting travel?
- Background/Related Project Growth – Do the level of service (LOS) projections have sufficient growth in background traffic?
- Trip Length and VMT – Are the trip length projections used for specific land uses accurate?
- Travel Demand Management – Are the measures employed by projects consistent with the level of effectiveness in the Citywide model?
- Modal Split – Do the mode splits used for the project make sense? Are they predicting similar splits to the travel model?

In summary, the model can be used to assess VMT and LOS for development projects. However, this is size dependent. For example, the model can be used to assess the VMT impacts of larger land uses such as shopping malls or studios. Travel demand forecasting models such as the proposed citywide model are less sensitive to smaller land uses and are not recommended for these types of projects.

3. How would you explain to the community why the City's traffic study guidelines and environmental impact thresholds need to be updated with the change from LOS to VMT? Has your firm conducted successful community outreach on SB 743 and VMT?

The need for increased reliance on a Travel Demand Model is being driven primarily by the changes to the CEQA guidelines, now in draft final form, and the fact that those guidelines will continue to rely more heavily on VMT analysis. During the last decade there has been a significant move towards planning for and accommodating greater levels of multi modal travel. Statewide and local policy has been changing (Senate Bill 743) and there are new environmental (CEQA) guidelines that will soon become mandatory.

The current adopted City traffic study guidelines are primarily automobile focused and rely heavily on evaluating traffic impacts through the use of the level of service (LOS) methodology. The City's existing traffic study guidelines (with the adoption of SB743) will need to be updated to incorporate all the new procedures necessary to conduct a project-level VMT-based analysis. This update will also include any pertinent evaluation protocols that result from the revised state CEQA Guidelines pursuant to SB 743. It should be recognized that SB 743 does not preclude the City from including additional analyses that are critical to Culver City when evaluating a proposed development project, such as site access, queuing at project driveways, queue spillback to the immediate adjacent intersections and roadway operations (such as LOS).

Public outreach and visual communications continues to be a vital area of expertise and differentiator for Fehr & Peers. Our planning and design services are of the highest quality in the industry, and our ability to communicate the findings of those services is also industry-leading. Our staff are experts in a wide range of marketing communications and project communications, which allows our clients to realize benefits far beyond that of our industry's traditional expectations. Our creative services for outreach include:

- Logo and brand development: identity packages, social media
- Collateral: brochures, documents, advertising, conference presence;

- Infographics: conversion of data to understandable graphics;
- Multimedia: websites, presentations, drone aerial footage, promotional videos;
- Creative: campaigns, audience engagement strategies, emerging technologies;
- Interactive 3D visualizations for public meetings and community engagement;
- Photo-simulations of future conditions with alternative treatments;
- Photo-simulations of future conditions by removing current characteristics; and
- Visual demonstrations of planning alternatives.

Fehr & Peers has been extensively involved with outreach regarding SB 743 and VMT. Two local projects that have had such outreach include the development new traffic study guidelines for Pasadena and the evaluation of the Pasadena General Plan Mobility Element. In the Pasadena example, we helped the City evaluate and select metrics, identify thresholds, that resulted in a formally vetted and Council adopted VMT threshold. As part of this process we attended public outreach meetings and public hearings.

The second, and currently ongoing, study is the City of Los Angeles' Infill and Complete Streets Project: Capturing VMT Impacts and Benefits pursuant to CEQA. In this project we are responsible for conducting staff training, stakeholder education and public outreach on the new approach to transportation impact review. Our approach to public outreach often involves working with city staff to develop a variety of user friendly materials that engage stakeholders and educate the public on project and plan level VMT analysis.

At the statewide level, Fehr & Peers has advised the Office of Planning and Research (OPR) staff in regards to SB 743 implementation and participated in close to 20 presentations statewide and nationally as well as numerous meetings with various agencies and other stakeholders.

4. How are the benefits of TDM and TSM included and evaluated in the model?

The existing scope and budget includes the incorporation of TDM/TSM in the travel demand model. The model framework proposed will account for automobile, transit, bicycle and pedestrian travel when determining VMT as these are part of the mode split process used in the model.

Some TDM measures can be applied in line within the TDFM framework through the use of elasticities (e.g., parking policy, trip reduction strategies, and transit strategies) while others may have to be applied off line and evaluated outside of the model. Off-line tools that we have used successfully in the past include MSAT and Fehr & Peers' TDM+ tool (which implements CAPCOA strategies). To the extent that these affect person or vehicle trip making, the model inputs can be modified to accommodate TDM measures.

TSM measures, ATSAC, ATCS and cameras etc. could be factored into the model by adjusting capacity. These types of measures could result in an increase, not decrease, of VMT.

To understand the benefits of the TDM/TSM strategies, the model has a variety of outputs that can be summarized graphically or in tabular format, including:

- Vehicle Miles Travelled (VMT)
- Vehicle and Person Trips (VT & PT)
- Mode Split percentages
- Segment and Intersection LOS (typically requires a post processor) and traffic volumes
- Vehicle Hours of Delay (VHD)
- Transit Ridership
- Trip Distribution percentages

- Information for air quality calculations (e.g. VMT by speed bin)
- Proximity metrics for bicycles, pedestrians and transit lines

These metrics can be evaluated both before and after applying TDM/TSM strategies and the results can be compared to ascertain the effectiveness of each strategy or a grouping of strategies.

5. Where are traffic counts needed; i.e., midblock counts and/or intersection turning movement traffic counts?

When calibrating and validating a travel demand model, traffic counts are typically needed at the roadway segment level. These would be located based on the character of the street which includes factors such as the number of driveways and the mix of land uses. The Fehr & Peers proposal includes a budget for up to 150 count locations (24-hour segment counts on a typical weekday). These counts will be split among the following count types:

- "Screenline" based count locations. A screenline is a travel modeling term used to denote a virtual line through the City and understand travel patterns across that line. Generally, there are multiple north/south and east/west screenlines in a model development project. These screenlines consist of multiple daily roadway counts located strategically throughout the City which are used to validate the travel model to on the ground conditions.
- "External" based count locations. The Culver City travel model will be developed to measure travel patterns within Culver City. To do this, we will also model surrounding neighborhoods to Culver City. To understand travel patterns in and out of the model area, traffic counts will be collected at entry/exit points to the model area.
- "Trip generation" based count locations. These counts will be used to understand the vehicle and person trip generation characteristics in Culver City. Key neighborhood types will be selected and traffic counts will be conducted to capture all trips generated by a neighborhood. This will allow the City to validate the trip generation characteristics of the model and make them locally sensitive.

Intersection turning movement counts are not typically required for model calibration/validation, but are needed if the model is to be used to forecast LOS at an intersection level as travel models are not usually designed for estimating turning movements. The state of the practice approach for the calculating intersection LOS involves developing a post processor (usually in an Excel spreadsheet) and can often involve applying the difference or the ratio method (NCHRP 765) to forecast turns accurately. The difference method calculates the difference between the model base and the forecast years and applies it to the observed traffic count, while the ratio method looks at the ratios between the model base and forecast year turning movements and applies this to the observed count.

6. How will applicants' technical consultants use the model to determine their projects' VMT and greenhouse gas emissions and their impacts?

There are many different options for a City to consider when using a travel model for a traffic study. This often depends on what is required for the study and we recommend that this is best addressed during the traffic study guidelines update task in the RFP, when the new approach to CEQA transportation analysis has been determined. At the most basic level, the model could be used for a growth rate or trip distribution

analysis when calculating LOS. In the case of VMT it could be used for a trip length assessment along with trip generation estimates. More complex approaches include updating the SED/Land Use, forecasting the LOS/VMT and post processing the results. The TDFM will output VMT by speed bin, which can be used by consultants preparing air quality and GHG analyses.

There are three potential approaches for the City to consider with a travel model:

1. The model can be run by City staff and the results provided to the project applicant and traffic consultant.
2. The model can be provided to the applicant's traffic consultant and they complete the analysis and report back to the City.
3. The City can hire a third party (qualified travel demand modeler/consultant) to undertake the analysis independent of the project applicant and provide then results to the applicant/City.

Regarding approach 2 above, it is recommended that the City develop a model user agreement (MUA) for the applicant/traffic consult to sign prior to receiving the model. This clarifies who is responsible for the data/results and is typically undertaken by agencies that provide consultants with a travel model (e.g. SCAG). Another good idea is to keep a log of all changes that are made to a travel model. This is often known as "version control" and provides the City with a record of how the model has changed over time and can be used to assess the models validity for a specific task.

7. What information is needed from the City to prepare the VMT impact fee nexus study?

Fehr & Peers has recently been involved in the preparation of two local trip fee programs in adjacent sections of the City of Los Angeles: the Coastal Transportation Corridor Fee Program and the West Los Angeles Fee Program. Both are VMT-based fee programs and were recently approved by the Los Angeles City Planning Commission.

The typical information needed from the City could include:

- SED/Land Use for the forecast year (this is to determine growth in VMT);
- Assistance with the community engagement/outreach;
- A list of projects that the City wishes to include in the fee program. This typically includes the projects that are part of the General Plan Mobility element but does not have to be limited to this;
- A fully calibrated and validated travel demand model;
- Economic review – Prepared either by the City or an economist;
- Staff review and input on the results and fee ordinance; and
- Assistance with the impact fee adoption process.

The level of effort and involvement varies between local jurisdictions with some agencies taking a more involved role, while others rely more heavily on the consultant team. We would be happy to discuss this further to better understand what level of involvement the City requires.

8. Can the nexus study be done concurrently with the construction of the model so that both are completed in the ±12-month schedule or is extra time needed?

The nexus analysis could be conducted post development of the model in the 12 month schedule. This would require the list of projects to be developed concurrent with model development along with planning-level cost estimates for each project. We estimate that the model could take up to nine months to develop/finalize which would leave three months to finish the nexus study. Given the compressed schedule the nexus analysis could be completed but would need to be done in parallel with the other scope tasks (finalizing traffic study guidelines, GPU technical support and TDM assistance), but the outreach process is unlikely to be achieved during this timeframe.

Another factor to consider in the process is that nexus studies typically rely on an adopted set of SED/land uses, usually consistent with the City's General Plan and Mobility Element. In this case, the City is unlikely to finalize and adopt the SED/Land Use for the General Plan within a 12 month timeframe. If the nexus study proceeds with a draft set of SED/Land Use then the analysis could be at risk if the City Council or Staff decide to modify the land use post nexus analysis or during the adoption of the General Plan. It has been our experience that there is a high likelihood of this happening based on input from the GPAC or commissions/councils.

Given the aforementioned concerns, it is unlikely that the fee program could be developed within the 12-month timeframe.

9. Can you tell us about a project that may have started to get off the tracks but you were able to readjust and get on course again?

Our estimates of the time required to develop, calibrate and validate a travel demand model are reasonably accurate. We have found that most model development projects are reliant on SED/Land Use data inputs to achieve the desired timelines/schedules. The best way to avoid schedule delays is to develop a work plan at the beginning of the project which defines the roles and responsibilities of the consultant team and the City (including communication protocols, regular check-ins, and review points).

When developing a model, delay usually occurs if there are issues with the SED/Land Use inputs, which are typically related to the level of detail required. When delays like this arise, the options are discussed, and a decision to proceed or adjust the schedule is made with the client.

We have examples of projects that have met schedules and other where schedules have been adjusted. As mentioned above, this has often been due to a delay in obtaining the input data. We would be happy to refer you to some of our prior and current clients who can provide a reference regarding our project performance.

10. Will the TDFM have the capability of:

- **Forecasting transit ridership at stop level? Route level?**

Typically, travel demand models are not developed with the level of detail necessary to forecast ridership at a line and stop level. This would require a substantial calibration effort that could potentially be provided as an optional task.

- **Evaluate the benefits/impacts of projects such as bus lanes or bike lanes?**

The model will have the capability to evaluate the impact of both bus and bicycle lanes where they are taking vehicle roadway capacity. The effect of bus services that are in their own dedicated right of way on mode split can be modeled in the transit element of the model; however, the model does not assign bicycle trips.

- **Evaluate the benefits of services such as micro-transit, bikeshare and scooter-share?**

The effect of services such as micro-transit, bikeshare and scooter-share are new technologies and are difficult to model in a traditional four step forecasting model. The primary difficulty is lack of data for calibration because these types of systems are relatively recent developments and are typically privately operated.

In the case of micro transit, the providers have the ability to modify their service based on the short term and long term changes in travel behavior (further information available at <http://www.fehrandpeers.com/microtransit/>) with little notice. A travel demand model relies on a fixed route system and is less flexible when it comes to this type of service. If the micro-transit is to act as a first-mile/last-mile strategy, it could be incorporated into the model by adjusting access time to transit. Alternatively, if specific routes are being considered, they could be coded into the transit network in the model.

Bike share and scooter-share are new technologies, are rapidly changing, and have limited data. However, Fehr & Peers has completed extensive work and data collection on bike share projects throughout the country and multiple locations within the southern California region (including Metro bike share). This work has included researching new technologies, analyzing ridership data, developing bike share suitability indices, and developing a state of the art bike share forecasting tool. Our in-depth understanding of bike share services could be incorporated into the travel model. If information can be obtained from scooter-share providers, we can evaluate it and provide the City with recommendations regarding how its influence on vehicle trip reduction could be incorporated.