Transportation Committee
Meeting Date: 5/3/2018
Agenda Item No.: 2018-May-8.

Subject: New Mobility Options, Disruptive Technologies, and Forecasting for the 2020 Metropolitan Transportation Plan/Sustainable Communities Strategy (Est. time: 10 minutes)

Information

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Attachments: Yes

1. Issue:

SACOG is required to prepare long range forecasts for the 2020 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS). How are we approaching this requirement at a time when many uncertainties face us?

2. Recommendation:

None, this is for information only.

3. Background/Analysis:

SACOG is required to prepare long range forecasts in support of its MTP/SCS and the Metropolitan Transportation Improvement Program (MTIP) as part of its role as the Metropolitan Planning Organization (MPO) for the Sacramento Region. Because so many disruptions are unfolding in real time, with more in the future, many may question the value of long range forecasts. Dan Sperling, at the April Board Workshop, referenced many of the disruptions and the uncertainties around how people will adapt to them. Dr. Sperling also raised the need for public agencies to be actively involved in tracking those changes and adapting policies and investments to maximize the chances for positive outcomes. The purpose of this item is to share with the Committee:

- Actions SACOG is taking regarding adapting our travel forecasting tools to begin including shared modes and autonomous vehicles (AVs);
- Actions SACOG is taking regarding research and monitoring of emerging mobility options; and,
- Collaborations with other MPOs SACOG is actively participating in to better understand how disruptive change can be productively integrated into the long range transportation planning process.

Additionally, staff would like input on a concept for using a more conservative approach for forecasting travel demand for purposes of the 2020 MTP/SCS, and to prepare a separate analysis of several different scenarios of future deployment of autonomous

vehicles (AV) in the region. This separate analysis would constitute a "risk assessment" of the 2020 MTP/SCS regarding the impact of AVs in the future. The risk assessment will be used to identify additional actions the region should initiate and pursue over time. Risk assessment topic areas: research and monitoring; planning and policy development; modeling and analysis; pilot projects and testing; and projects and investments.

4. Discussion/Analysis:

Let us explore what changes to transportation and mobility have happened, through the lens of a resident of the Sacramento region from 1980. If an adult from 1980 was time-traveled to 2010, other than having different looking cars (and clothing!), most of what he or she saw would be familiar (four wheels with a driver, privately owned and operated, and the roads, signals and signage look about the same).

Since 1980, though many factors have changed and varied (e.g., cost of fuels, efficiency, and variety of vehicles available, population demographics, the economy, communication technology, etc.), the available modes of travel and travelers' responses to those modes have been relatively stable and predictable. Travel demand models are not and have never been perfect, but the stability in the slate of travel modes and mobility options available up to about 2010 made the job of travel demand forecasting relatively straightforward.

Starting in 2010, though, the transportation landscape began to change fundamentally: Uber served its first commercial trip in 2010—in May 2017, it served its 5 billionth trip worldwide. Some analysts project that combined ride-hailing trips will exceed transit passenger trips in the U.S. as early as this year (2018). Depending on where our 1980 adult landed today, some things would still look familiar, but he or she might have a lot of new things to absorb: Noticeable share of Uber and Lyft travel. Bike shares. Car shares. Electric cars. Electric *bikes*.

Imagining that same 1980 adult in 2040, the horizon year for our 2020 MTP/SCS—the world will certainly look much different. One obvious difference is likely to be the presence of autonomous vehicles—passenger cars, buses, trucks of all sizes. Opinions differ as to how much AVs will penetrate by 2040, but few differ on the likelihood that a third or more of our vehicles will be autonomous, including delivery and freight vehicles. The extent to which AVs may also be *connected* is more debatable. The extent to which autonomous vehicle technology affects transit is more debatable still. But even where the future level and form of deployment of autonomous or connected vehicles is debate-able, there is no question that they will be part of the future. The questions arise as to how much and how fast deployment will be, and even more so on the second- and third- order effects.

So—given how much things are likely to change between now and 2040, how can SACOG have credible, and more important, useful forecasts using the tools we have available now? SACOG is doing several things to adjust to these new, emerging realities.

Smart Region Project. The major objectives of the Smart Region project are how to evolve and adapt our transportation management infrastructure to improve safety, system reliability, and overall user experience for the region's travelers. When elements of Smart Region are implemented, data and information from the project will be useful in tracking

and understanding deployment of new technologies. Additionally, the strategies developed as part of the project will be helpful in understanding what tools may be available for managing the longer term repercussions of disruptive changes over time. http://www.smartregionsacramento.org/

Enhancements to SACOG Travel Demand Model. We have been working very hard to adjust our model (SACSIM), to include two new modes of travel, and one new way of using vehicle modes. The two new modes: Transportation Network Companies (TNC) like Uber and Lyft; and AVs. The new way of using AVs is sharing (as opposed to private, household level ownership and use). The software vendor for our core model has taken all the available research on both TNCs and AVs and provided code and guidance to its clients to add these new modes and uses—SACOG is in the first wave of MPOs to do rigorous testing, with the intention of using these new tools for the 2020 MTP/SCS. Attachment A summarizes results of testing to-date. When testing and development work is completed, we will use the enhanced model to do a scenario-based risk analysis of AVs potential impact to the MTP/SCS.

Participation in Research and Monitoring. SACOG is participating in several significant research efforts, in partnership with the other MPOs and state agencies.

· The "Future Mobility" (FM) agreement facilitates pooling resources for several topics: greenhouse gas reduction strategies, AVs and connected vehicles, automation of freight, and next generation transit. Monitoring and modeling aspects of these topics is identified as a focus area. (Partners: MPOs in the San Francisco Bay Area, Los Angeles area, and San Diego).

· The "MPO Household Travel Survey Design" project is a cooperative design and test of a new survey instrument and methodology, and a collaboration on research based on recently collected travel data in San Diego, a survey that includes the first detailed data on TNC use in a major metropolitan area in California. (Partners: MPOs in the San Francisco Bay Area, Los Angeles area, and San Diego).

· The "Big Data for Transportation Planning Pilot" project pools funding to procure transportation data and analysis services based on GPS traces, cell phone traces and passively collected location data. Although the purpose of this project is to procure big data services for a wide range of transportation analysis questions, one goal of this project is to use big data to track use of new modes of travel, such as TNCs. (Partners: Caltrans, California Air Resources Board).

In addition to these partnerships, SACOG is conducting its own detailed household travel survey. The data from this survey will include the first detailed information on TNC usage by residents of our region, as well as other new options like bike shares, car shares, etc. The data collected in this project will be extremely useful to understanding how currently available shared modes are valued and used by households with different demographic characteristics (income, age, etc.), and in different locations.

For the 2020 MTP/SCS:

SACOG will use the best information and tools available today to prepare a long range forecast for the 2020 MTP/SCS. Where significant uncertainty exists as to the deployment

levels of future disruptive technology, SACOG will develop a risk assessment of the MTP/SCS forecast. Risks are defined as MTP/SCS performance failure (e.g., Clean Air Act, Greenhouse Gas reduction target, revenues to support plan, system performance).

Based on the results of the risk assessment, the need for future policy development and actions action will be identified and added to the MTP/SCS. Future policy development will be specified as an identified risk (e.g., rapid deployment of AVs increasing the rate of Vehicle Miles Traveled growth, wide scale adoption of TNCs and shared AVs undermining the market for conventional fixed route transit), and a potential slate of generically defined policies that may reduce the risk.

Active and innovative monitoring of deployment of disruptive technologies will be initiated and maintained over time, in order to assess implementation of the MTP/SCS and the effects of change and disruption over time. Active monitoring is the best action SACOG can take to identify a potential failure happening early enough to make necessary adjustments, know that many of the adjustment require time to develop and implement.

5. Fiscal Impact/Grant Information:

This item has no fiscal impact to the agency's operating budget, other than already budgeted staff time.

ATTACHMENTS:

Description

Attachment - Initial Model Testing Results

Attachment A: Initial SACSIM Model Testing of AV Scenarios

Notes: Reported below are results of initial testing of new features of the SACSIM travel demand model. Testing focused only on AV deployment level and degree of sharing of AVs. Future testing will include "second order" effects of AVs (e.g. changes to the market for paid parking) and connected vehicles (e.g. increases in highway capacity).

Key to Changes:	Increase	Decrease
Small	↑	↓
Medium	↑↑	↓↓
Large	↑↑↑	↓↓↓

Test Scenario Factors	Baseline	Shared Mobility	Un-Shared Mobility
AV Deployment	None	High	High
Sharing	Very Low	High	Low
Transit	Current Level	Currentl Level	Current Level
Bike/Walk Infrastructure	Current Level	Current Level	Current Level
Test Outcome Metrics		***(changes, relative to Baseline)***	
Vehicles per Household	1.90	↓↓	↓
Vehicle Miles Traveled	43,000,000	↓	↑↑
Transit Mode Share	1.2%	↓↓↓	↓
Bike Trips	1.4%	↓	↓
Walk Trips	6.6%	↓	↓
TNC Trips	1.4%	↑↑↑	↑

Source: SACOG, 2018.