January 4, 2011

TO: Commission, Director, and Deputy Directors

FROM: Amar Pillai, Transportation Modeler

SUBJECT: Adoption of ACHD’s Local Model
Staff Report for January 12th, 2011 Commission Meeting

Executive Summary
Staff has recently updated the new regional travel demand model to incorporate changes recommended during ACHD’s Transportation/Land use Integration Plan (TLIP) process. After a careful evaluation of the effects of these changes, staff recommends adopting the modified model for the 2012 Capital Improvement Plan (CIP), the Five Year Work Plan (FYWP) prioritization and future development review.

Background
As part of ACHD’s Transportation Land-use Integration Plan (TLIP) there were several modifications recommended for the regional travel demand model to improve ACHD’s planning process. A summary of the changes is included as Attachment A. These changes would primarily pertain to the Capital Improvement Plan (CIP), but also affect the Five Year Work Plan (FYWP) prioritization and development review.

ACHD received the 2010 update to the COMPASS model in May 2010. The update included some of the changes from TLIP, notably the more detailed traffic analysis zones (TAZ), which assists with better evaluation with collectors. ACHD technical staff (Planning and Traffic Departments) evaluated the other recommended modifications from TLIP that COMPASS has chosen not to include at this time. After a detailed review of the outputs from the model, staff recommends revising the model as proposed during the TLIP process and formally adopting it for the next update to the Capital Improvement Plan.

With this change:

- The COMPASS regional model will effectively indicate where trips want to go thus making it good for regional planning.
- The ACHD local model will effectively predict where trips are most likely to go thus making it a better decision making tool for resource investment at the local level.

The difference between the two models is because the ACHD model places more emphasis on simulating congestion. Both models provide useful information and together provide policy makers with better information to make decisions.

The findings and recommendations of ACHD’s analysis were presented and discussed with COMPASS staff, COMPASS’s Travel Model Advisory Committee (TMAC) and ACHD’s Capital Investments Citizens Advisory Committee (CICAC). At this point, staff recommends using the modified model for the
The modified local model results were compared to actual volumes for 2010 and staff found it meets industry standards.

Policy Ramifications
The major policy issue raised was concern about two models and possible uncertainty among users about which one to use and under what conditions. Staff researched the use of local models in other communities and states and found that 1) there are many examples of multiple models with differing uses at the regional and local level, and 2) uncertainties can be addressed with a policy clearly delineating uses and protocols for coordination.

COMPASS uses the daily model for all its planning applications and ACHD uses the peak hour model for its planning needs primarily pertaining to the CIP. The suggested modifications are only to the peak hour model as ACHD uses that for the CIP, FYWP prioritization and development review. A user seeking daily model information will use the COMPASS regional model. By adopting the modified local model, ACHD will be directing users seeking peak hour data to use ACHD’s modified local model. Peak hour data is used for the CIP, the FYWP prioritization and for Traffic Impact Studies for development review. Both models may be used for planning studies and capital project design, depending on the questions being answered, because they tell us somewhat different things about travel demand.

ACHD and COMPASS staff are working towards unifying the two models for the next long range plan update due in 2014. In the meantime ACHD staff feels it is appropriate to use the modified local model.

Commission Direction
Staff seeks direction from the Commission on proceeding forward with adopting the model with the modifications for ACHD planning needs.

- Does the Commission want any additional information?
- Does the Commission prefer to be on the consent or regular agenda?

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Technical model modifications: The following four variables are recommended for modification.

I) **Include new or extend existing collectors for forecast years as identified in the Master Street Map:**

What is it? The future collector network was developed in close cooperation with the local land use jurisdictions. Collectors improve street connectivity by supplementing the arterial network.

Why does it matter? Collectors add capacity, provide alternative routes and often reroute shorter local trips from the arterials.

II) **Adjust posted speeds on some road segments for forecast years:**

What is it? In the COMPASS model, future posted speed on each road is assumed to be the same as exists today. The ACHD model was modified to reduce posted speeds in areas predicted to be urbanized in future years. For example, at present Ustick Road east of Linder Road is posted at 45 mph. In forecast year 2035, this area is projected to be urbanized, so the posted speed is reduced to 35 mph.

Why does it matter? Speeds, if not coded properly, could significantly change model results. The model distributes trips based on the fastest route. If a road is modeled with a posted speed that is higher than ACHD would allow, more trips will be allocated to that road and fewer to other parallel routes.

III) **Use different Volume Delay Functions (VDFs):**

What is it? Volume delay functions adjust modeled travel speed based on the level of congestion. Higher levels of congestion increase travel time and some trips move to an alternative route with less congestion (and hence, shorter travel time). Volume delay functions are formulae that determine how much traffic is delayed as the volume of vehicles on the road increases.

Why does it matter? The modified model includes volume delay functions that slow trips down more as traffic volumes increase compared to the COMPASS model. As travel speeds decrease the model will allocated trips to alternate, faster routes.

IV) **Increase capacities on state facilities:**

What is it? The COMPASS model assumes vehicle capacity on state facilities to be the same as any ACHD arterial. State facilities typically have higher speeds, more access control and increased green time at intersections, and thus higher capacity.

Why does it matter? If the capacities are set too low on State Highways the model will allocate more trips to ACHD arterials. The CIP may indicate widening is needed sooner than necessary.