



DATE: April 8, 2019

TO: Transportation Authority of Marin Administration, Projects & Planning Executive Committee

FROM: Dianne Steinhauser, Executive Director
Derek McGill, Planning Manager

SUBJECT: Accept the TAM Demand Model and Model Use Policy (Action), Agenda Item No. 8

RECOMMENDATION

Recommend that the TAM board accept the TAM Demand Model and Model Use Policy.

BACKGROUND

TAM as a Congestion Management Agency (CMA) is required to maintain a uniform database on traffic impacts for use in a countywide transportation computer model. This model is used for estimating future travel needs and impacts. The County of Marin Public Works Department (DPW), as Marin County's original CMA, developed the initial database and contracted the software for the Marin Travel Model (MTM). Upon TAM becoming the Marin CMA in 2004, the County's travel model, MTM, became the responsibility of TAM. Travel models are required to maintain consistency with the Regional Travel Demand Model, currently ModelOne, prepared by the Metropolitan Transportation Commission (MTC.) MTC has been in development of updating their regional model to a newer version, called ModelTwo, and this process is still underway. When MTC transitions to ModelTwo, TAM will need to demonstrate consistency with the new model.

At the May 2016 TAM Board of Commissioners meeting, TAM approved a model contract with Fehr and Peers, a transportation consulting firm to develop the Transportation Authority of Marin Demand Model (TAMDM). TAMDM has been developed to provide TAM consistency with MTC's current ModelOne and MTC's future update to ModelTwo.

DISCUSSION/ANALYSIS

As a CMA, TAM is required to maintain a travel demand model consistent with regional travel demand models. TAM does not provide in-house modeling services and instead uses an on-call contract currently with Fehr & Peers to develop, maintain consistency and operate the travel model.

The travel model is used to estimate demand on the transportation system from regional growth, new transportation projects, new land use/development projects or large planning efforts like general plans. The model provides an estimation of volumes, vehicle to capacity (ratios), vehicles mile traveled (VMT) and other metrics for use in detailed traffic studies. Operational improvements in a corridor will often use a secondary modeling process to provide detailed operational assessments that cannot be provided by the TAMDM alone. Each project will need to determine the appropriate tool to use to conduct traffic or operational impacts, and TAM staff works with project sponsors to assist in selecting the most appropriate tool.

TAMDM is an activity-based model based on MTC's work to develop Travel Model Two. Activity based models are current state of the practice as suggested by the governor's Office of Planning and Research and largely are replacing traditional four-step models in the bay area due to MTCs adoption of Travel ModelOne. This aligns TAM well for model consistency requirements in the years ahead. The model is a combination of software and transportation data and requires powerful computing tools to operate.

TAMDM is a focused model of the regional Travel ModelTwo, providing increased detail of Marin's transportation networks and population and employment distribution. The roadway networks were reviewed by Marin County Public Works Directors and TAM consultants for accuracy in speeds, travel lanes, and network detail in 2017. Transit networks were heavily revised during the development phase to represent transit services as in place in the base year of the model, 2015. In addition, the transportation networks in the model include the SMART rail line and stations, coded into the model to allow for this transit network to be represented in future traffic studies and planning efforts. Additionally, the Marin County Planning Directors in 2017 closely reviewed existing population and employment data to ensure the base year of 2015 was correctly represented in the model.

Overall TAMDM provides:

- A much more detailed spatial representation of transportation system supply, reviewed by local agencies
- Land-use and demographic forecast integration represented at 202 traffic analysis zones and 1,418 micro-analysis zone (MAZ) level for Marin
- Detailed transit access/egress based on actual origin/destinations at the MAZ level considering boarding and alighting at specific transit stops allowing for a more accurate representation of walk times
- Detailed transit network coding of routes and headways on all transit operations including SMART
- More detailed temporal resolution using half-hourly time windows compared to hourly time windows
- More detailed auto assignments, most notably with the loading of short trips to local streets
- The inclusion of Taxis and Transportation Network Companies (TNCs) such as Uber and Lyft as a mode choice option
- Representation of Automated Vehicles for future testing.

To better understand travel patterns within, into, and out of Marin County, a number of datasets were analyzed, including:

- County-to-county worker flows from the 2009-2013 American Community Survey (ACS)
- County-to-county work and all tour flows from the 2010 California Household Travel Survey
- County-to-county transit trip flows from a number of transit on-board surveys conducted throughout the SF Bay Area between 2004 and 2015.
- County-to-county trip and worker flows from the TAM Origin-Destination Data Collection Report (Sept 2018).

TAMDM model runs times have been reduced to approximately 24 hours, and overall model validation and calibration efforts meet state and regional metrics. The model validation results have been shared with local jurisdictions and checked for reasonableness. Model calibration and validation used the following sources:

- Highway (Local Traffic Counts)
- Transit (Transit Boardings)
- Origin-Destination (Travel Behavior Study)
- Workers and Work Location (Census, TBS)
- Vehicle Miles Travelled (CHTS, Models, TBS)
- Travel Times (Big Data)

TAM uses a shared cost agreement with local jurisdictions that allows them access to the MTM and consultants at cost. TAM staff expects modeling requests to be higher than in the past due to SB 743 legislation and changes with CEQA transportation analysis, as well as other planning needs, including general plan updates. TAM staff recommend acceptance of the model at this time.

Model Use Policy

An update to TAMs model use policy is also recommended at this time. Included as **Attachment A**, the Model Use policy guides consultant and other agency use of TAMDM. the policy requires all users of the model to:

- Receive written permission from TAM prior to using Model
- Use qualified consultants
- Document any revisions made to the model (TAM staff would then consider whether to direct our consultants to make these changes to the county model or not)
- Commit to legal and operating commitments.

This policy was also reviewed by local jurisdictions public works and planning staff and transit agencies at a working group meeting hosted at TAM.

FISCAL CONSIDERATION

Due to the need to engage a new modeling contract, and legislation requiring more robust analysis to comply with revised CEQA guidance in 2015, TAM approached a sub-committee of the Marin Managers Association to increase the city county contributions to TAM for three planning activities including:

- development of a new travel demand model (completed in March 2019);
- development of the Strategic Vision plan (accepted by the TAM Board in November 2017);
- ongoing traffic monitoring and reporting, this process has included new locations and an expanded traffic counting program, has been underway since 2016, as well as the completion of counts on Marin's highway ramps, and TAMs Origin and Destination Report using Big Data sources from GPS and mobile device data

The model update is being completed with the increased local fee structure and no additional funding was needed or is being requested at this time.

NEXT STEPS

Based on acceptance of TAMDM and the Model Use Policy, the City of San Rafael will begin immediately to use the model for the development of the San Rafael General Plan circulation element. Concurrently, TAM consultants will develop a 2040 horizon year of network changes and regional growth patterns. A user guide for TAMDM will then be developed and the validation report will be finalized.

ATTACHMENTS

Attachment A: Model Use Policy

THIS PAGE LEFT BLANK INTENTIONALLY

TRANSPORTATION AUTHORITY OF MARIN

AGREEMENT TAMDM 1X-XX
FOR USE OF THE
TRANSPORTATION AUTHORITY OF MARIN
TRAVEL DEMAND MODEL

TRANSPORTATION AUTHORITY OF MARIN (“TAM”) and USER. Transportation Consultants (“USER”) as of the date set forth below, do hereby agree as follows:

1. The Transportation Authority of Marin (TAM) does not provide in-house modeling services for Congestion Management Program (“CMP”) purposes. TAM is, however, responsible for the upkeep and maintenance of the TAM Demand Model (TAMDM) originally developed by the TAM. TAMDM consists solely of data and supporting information. In conjunction with separate modeling software, TAMDM provides forecasts of the impact of transportation projects and land use changes on traffic in Marin County.
2. TAMDM runs on Cube Citilabs software. This software is owned by Citilabs, and must be separately licensed by the User. TAM will provide for use by the USER, solely for the purposes of, and pursuant to, this Agreement, the TAMDM data banks, which include all transportation network and other data inputs and supporting information necessary to run TAMDM on Cube Voyager, and the activity-based modeling process for Traffic Analysis purposes.
3. TAM agrees to provide USER a personal, non-transferable and non-exclusive license to use and adapt data files from its Travel Demand Model, or portions thereof, including all input and output files (electronic or otherwise) and any data, including but not limited to traffic count, land use, and network data, needed to run the CUBE software platform, Java, Python, R or any similar software for the purpose set forth in Paragraph 4.b. below, including the TAM Travel Demand model, and any derivations thereof, inclusively, the “MODEL.
4. USER agrees:
 - a. to only install, operate and use TAMDM on a computer system owned, leased or otherwise controlled by USER in its own facilities;
 - b. to use and execute all portions of TAMDM on such computer systems for the limited purpose of miscellaneous traffic impact studies for new development proposals, associated environmental impact analyses, fee impact studies, transportation project analysis, and the evaluation of proposed transportation strategies and plans;
 - c. to only make such number of copies of TAMDM as necessary for the foregoing purposes, and a further reasonable number of copies solely for nonproductive back-up purposes in accordance with its standard procedures, provided that it accounts for such copies;

- d. to use TAMDM in accordance with the most current published version of the following guidance as applicable: 1) Activity Based Model Guidance such as Metropolitan Transportation Commission (MTC) Travel Model One Guidelines, 2) Caltrans modeling guidelines, or 3) FHWA guidelines.
 - e. prior to using the model or data, to notify TAM in writing of each specific study or project User expects to undertake;
 - f. to provide TAM with written documentation of any revisions to TAMDM;
 - g. any use, copying, distribution, adaptation or public display of TAMDM by USER not authorized by this Agreement shall automatically terminate USER'S rights hereunder. Use of TAMDM on processors accessible through communications networks through terminals and devices not on premises owned or controlled by USER is prohibited unless otherwise agreed in writing by TAM;
 - h. To promptly notify TAM and make available to it all modifications, additions, or updates USER makes to TAMDM and shall grant TAM a perpetual, royalty-free license to use, reproduce, sublicense, and modify such modifications, additions, or updates;
 - i. To include TAMDM version number with all products resulting from the use of TAMDM
5. Title to TAMDM, including all modifications, additions, deletions, input and output file additions and modifications, updates, copies and derivative works thereof by USER, shall be in and remain with TAM. User hereby assigns to TAM ownership of all such modifications, additions, deletions, input and output file additions and modifications, updates, copies and derivative works. This information shall be kept in TAM's files. The USER must delete or destroy all copies of TAMDM and a copy of the modified data banks and supporting information. The USER agrees to notify TAM in writing when TAMDM has been deleted from all of the USER's computers and processors.
6. If the USER is required to copy and/or distribute any portion of TAMDM in response to a request made pursuant to the California Public Records Act (Government Code section 6250 et seq.), the User shall notify TAM promptly upon taking such action, and the USER shall attach or include the following notice with the copied and/or distributed materials:

The information contained herein is proprietary and belongs to the Transportation Authority of Marin ("TAM"), and may not be utilized for any modeling or related purposed without the express written permission of TAM.

5. TAM, ITS AFFILIATES, SUBCONTRACTORS AND REPRESENTATIVES MAKE NO WARRANTIES, EXPRESS OR IMPLIED, AND SPECIFICALLY DISCLAIM ANY WARRANTIES INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE

MODEL. USER AGREES THAT ITS SOLE REMEDY AGAINST TAM, ITS AFFILIATES, SUBCONTRACTORS AND REPRESENTATIVES FOR LOSS OR DAMAGE CAUSED BY ANY DEFECT OR FAILURE OF THE MODEL, REGARDLESS OF THE FORM OF ACTION, WHETHER IN CONTRACT, TORT, INCLUDING NEGLIGENCE, STRICT LIABILITY OR OTHERWISE, SHALL, TO THE EXTENT FEASIBLE (AS DETERMINED SOLELY BY TAM) BE THE REPAIR OR REPLACEMENT OF THE MODEL. IN NO EVENT SHALL TAM, ITS AFFILIATES, SUBCONTRACTORS OR REPRESENTATIVES BE LIABLE FOR INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, OR FOR LOST PROFITS, SAVINGS, OR REVENUES OF ANY KIND, OR FOR LOST DATA OR DOWNTIME, WHETHER OR NOT TAM, ITS AFFILIATES, SUBCONTRACTORS OR REPRESENTATIVES HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

6. This Agreement shall be effective as of the date set forth below and, unless terminated in accordance with Section 3 above or extended by written amendment to this Agreement, shall terminate on the earlier of the date that USER is not making use of TAMDM or **Month XX, 202X**. Upon termination, or upon immediate request by TAM, USER shall return all copies, and submit any modifications or derivative works and accompanying documentation of revisions to TAM. Thereafter, the provisions of Sections 3, 4, 5 and 8 shall continue to apply in accordance with their terms, notwithstanding the termination of this Agreement. The medium for submittals of electronic data files to TAM shall be arranged by USER in consultation with TAM. Writeable CD is an acceptable medium for submittal of electronic files.
7. This Agreement shall inure to the benefit of, and shall be binding on, USER and TAM and their respective successors and assigns, provided that USER shall not assign this Agreement or any right to use of TAMDM as provided herein, except to a successor to all or substantially all of the business and properties of USER, without the express prior written consent of TAM.
8. This Agreement and the rights and obligations of the parties with respect to TAMDM shall be governed by California law, as it applies to a contract negotiated, executed and performed in that state.

USER ACKNOWLEDGES THAT IT HAS READ THIS AGREEMENT AND UNDERSTANDS IT, AND THAT BY ENTERING INTO THE AGREEMENT, INSTALLING AND EXECUTING THE MODEL, OR MAKING ANY OTHER USE OF IT, USER AGREES TO BE BOUND BY THE TERMS AND CONDITIONS HEREOF. THE PARTIES FURTHER AGREE THAT, EXCEPT FOR SEPARATE WRITTEN AGREEMENTS BETWEEN TAM AND USER, THIS AGREEMENT IS THE COMPLETE AND EXCLUSIVE STATEMENT OF THE RIGHTS AND LIABILITIES OF THE PARTIES.

Agreement No. TAMDM 1X-XX
Month XX, 201X

This Agreement is made as of Month XX, 201X.

TAM

USER

Transportation Authority of Marin
900 5th Avenue, Suite 100
San Rafael, CA 94901

Company Name
Street Address
City, CA 9XXXX

By: _____
Derek McGill.
Planning Manager

By: _____
Signatory
Title