VTA Travel Demand Modeling
FACT SHEET

What is Travel Demand Modeling?

Travel demand modeling evaluates existing and future socioeconomic conditions, transportation networks, land-uses and pricing data to estimate future travel patterns.

Key inputs include

- Socioeconomic data (population, households, income and jobs)
- Transportation network data (existing and approved roadway, transit and bicycle & pedestrian projects)
- Pricing data (transit fares and vehicle costs for fuel, maintenance, parking, tolls, etc.)

Key outputs include

- Trip generation (number of trips made)
- Trip distribution (where those trips go)
- Mode choices (how the trips will be divided among the available modes of travel)
- Trip assignments of vehicle and transit trips (predicting the route trips will take)

What is the model used for?

Travel demand models are tools utilized by planners to understand existing travel patterns and predict future travel patterns to help define transportation improvement projects and policies.

What are the benefits of using travel demand forecasts?

Travel demand models can test "what-if" scenarios, based on variations of inputs, providing decision makers with the best predictions of how well a project may be utilized, how a project may be implemented, and what benefits and effects a project may have on the rest of the transportation network, community and environment.

What are model constraints?

VTA's travel demand model includes the officially adopted Association of Bay Area Governments (ABAG) forecasts of socioeconomic data constrained to county and city control totals as specified by ABAG. The VTA model also includes future transportation projects included and defined in VTA's Valley Transportation Plan and the Metropolitan Transportation Commission's (MTC) Regional Transportation Plan, the long-range vision plan documents for Santa Clara County and the San Francisco Bay Area, respectively.

How often are forecasts for population, households and job growth updated?

Socioeconomic data forecasts are updated every four years by ABAG in cycle with the update of the Regional Transportation Plan. These forecasts are developed by ABAG in coordination with local jurisdictions and the Metropolitan Transportation Commission.

How do we know the model predicts reasonable trips?

Once the model provides a "picture" of existing and future travel patterns, the results are then given a reality check. Modelers check with planners to make sure the results make sense and compare this input to observed current travel patterns. This is called a model validation.

How does VTA work with the cities?

VTA collects and maintains a database of approved development projects from each city in the county to compare and assist in the allocation of ABAG socioeconomic data forecasts from the census tract to the smaller VTA model traffic zones, as well as information from the city general plans. The allocations are reviewed by the local jurisdictions through VTA committees and working groups.

What other public agencies are involved in developing the travel demand model?

Information from several agencies is utilized in developing VTA's Travel Demand Model, including:

- ABAG (base year and forecast year socioeconomic data)
- BART (operating plan data)
- MTC (Regional Transportation Plan future projects and regional pricing assumptions)
- United States Census Bureau (Commuter Journey-to-Work data and household auto ownership data for base year validation)
- VTA (operating plan data and Valley Transportation Plan future projects)
- FTA (review of base year model validation and ridership forecast results)

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Travel Demand Modeling

Socioeconomic, transportation network and pricing data is input into the travel demand modeling software.

Socioeconomic Data


Population


Households


Jobs

Transportation Network Data


Roadways


Public Transit Lines and Stations


Bicycle/Pedestrian Paths

Pricing Data


Fuel Costs


Vehicle Maintenance


Public Transit Fares


Parking Costs


Bridge/Express Lane Tolls

Based on the input of the socioeconomic, transportation network and pricing data, the following is determined:

1. **Trip Generation**
   The number of trips from homes to jobs, shopping, recreational, schools, airports, special events, etc.
2. **Trip Distribution**
   The direction and path of travel based on where trips begin and end.
3. **Mode Choice**
   The number of trips made by public transit, solo drivers, carpools, non-motorized, etc.
4. **Network Assignment**
   The specific transit services or roadways that will be utilized.

Validation and Calibration

Review of model to ensure results make sense and provide a realistic "picture" of existing and predicted travel patterns throughout the region.

Santa Clara Valley Transportation Authority