FLORIDA TRANSPORTATION FORECASTING FORUM

Year in Review

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FLORIDA TRANSPORTATION FORECASTING FORUM

Ready for Launch

(anybody see my keys … ?)

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Next Generation of TDM & Forecasting

Mission Overview

FLORIDA TRANSPORTATION FORECASTING RESOURCE HUB

models

guidance

resources

training

committees

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fdot.gov/forecasting

Communicating The Value of Modeling

Travel Demand Modeling

Travel demand modeling is a key component of transportation planning used to forecast and analyze travel behavior and patterns within a region. Models help planners, decision-makers, and policymakers understand where, how, and why people travel. This allows them to determine the area's transportation needs and test future projects or scenarios.

ESTABLISHED DATA — Reliable data from reputable sources

PROVEN PROCESS — Standard forecasting and data analyses methodologies

RELIABLE RESULTS — Insights that support transportation decision-making

WHAT IS A TRAVEL DEMAND MODEL?

A software tool using mathematical algorithms to model, predict, and plan for future travel needs and modes of the transportation system for a specific region.

WHAT ARE THE CAPABILITIES OF A TRAVEL DEMAND MODEL?

- **FORECAST** the number of trips on a region's road network
- **PROJECT** long-range traffic growth patterns by area and roadway network
- **HIGHLIGHT** traffic impacts of new land use developments
- **ESTIMATE** ridership of a new transit service
- **EVALUATE** the effectiveness of various transportation project scenarios and alternatives

WHAT ARE THE LIMITATIONS OF A MODEL?

Models are a statistical estimation of travel behavior and not a crystal ball.

They should be used as a planning tool and not a means to a certain answer for a planning decision.

HOW DO WE KNOW THE RESULTS ARE RELIABLE?

Results are reliable because of the substantial vetting process used by stakeholders to build and run a model. The inputs used are from reliable sources such as the US Census Bureau, Federal Highway Administration, Bureau of Transportation Statistics, Florida DOT, local governments, employment forecasters, and others for network characteristics, counts, employment, school enrollment, and survey information. These data are used in an extensive adjustment process to match observed behavior and tested against information such as traffic counts and probe data to ensure its reliability. The model is ready for use when all stakeholders are in agreement that the results are reasonable and sufficient for planning purposes.

FLORIDA REGIONAL MODELS

MODEL	COVERAGE
Northwest Florida Region	Entirety of District 3
Northeast Region	Nassau, Baker, Duval, St. Johns, Clay, and Putnam Counties
Gainesville	Alachua County
Central Florida Region	All District 5 MPOs, including Polk County and a portion of Indian River County
Tampa Bay Region	Citrus, Hernando, Pasco, Pinellas, and Hillsborough Counties as well as a portion of Manatee County
Treasure Coast Region	Indian River, St. Lucie, and Martin Counties, as well as a portion of Palm Beach County
District 1 Region	Entirety of District 1
Southeast Region	Palm Beach, Broward, and Miami-Dade Counties
Turnpike (TSM)	Statewide
TIME (Transportation Interface for Modeling Evacuations)	Statewide

REGIONAL MODAL DOWNLOADS

Visit the MODELS page at www.fdot.gov/forecasting

Select "Download" for the desired model and follow the instructions.

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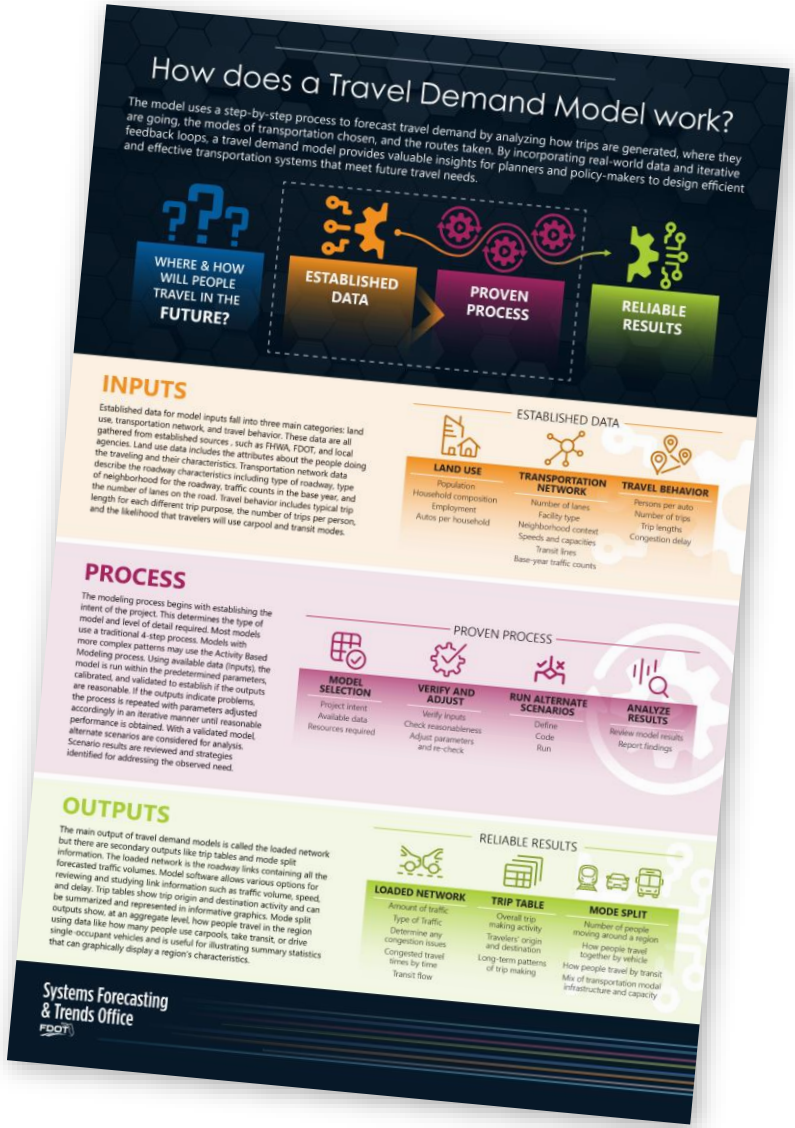

How does a Travel Demand Model work?

The model uses a step-by-step process to forecast travel demand by analyzing how trips are generated, where they are going, the modes of transportation chosen, and the routes taken. By incorporating real-world data and iterative feedback loops, a travel demand model provides valuable insights for planners and policy-makers to design efficient and effective transportation systems that meet future travel needs.

WHERE & HOW WILL PEOPLE TRAVEL IN THE FUTURE?

ESTABLISHED DATA → **PROVEN PROCESS** → **RELIABLE RESULTS**

INPUTS

Established data for model inputs fall into three main categories: land use, transportation network, and travel behavior. These data are all gathered from established sources , such as FHWA, FDOT, and local agencies. Land use data includes the attributes about the people doing the traveling and their characteristics. Transportation network data describe the roadway characteristics including type of roadway, type of neighborhood for the roadway, traffic counts in the base year, and the number of lanes on the road. Travel behavior includes typical trip length for each different trip purpose, the number of trips per person, and the likelihood that travelers will use carpool and transit modes.

ESTABLISHED DATA

- **LAND USE**: Population, Household composition, Employment, Autos per household
- **TRANSPORTATION NETWORK**: Number of lanes, Facility type, Neighborhood context, Speeds and capacities, Transit lines, Base-year traffic counts
- **TRAVEL BEHAVIOR**: Persons per auto, Number of trips, Trip lengths, Congestion delay

PROCESS

The modeling process begins with establishing the intent of the project. This determines the type of model and level of detail required. Most models use a traditional 4-step process. Models with more complex patterns may use the Activity Based Modeling process. Using available data (inputs), the model is run within the predetermined parameters, calibrated, and validated to establish if the outputs are reasonable. If the outputs indicate problems, the process is repeated with parameters adjusted accordingly in an iterative manner until reasonable performance is obtained. With a validated model, alternate scenarios are considered for analysis. Scenario results are reviewed and strategies identified for addressing the observed need.

PROVEN PROCESS

- **MODEL SELECTION**: Project intent, Available data, Resources required
- **VERIFY AND ADJUST**: Verify inputs, Check reasonableness, Adjust parameters and re-check
- **RUN ALTERNATE SCENARIOS**: Define, Code, Run
- **ANALYZE RESULTS**: Review model results, Report findings

OUTPUTS

The main output of travel demand models is called the loaded network but there are secondary outputs like trip tables and mode split information. The loaded network is the roadway links containing all the forecasted traffic volumes. Model software allows various options for reviewing and studying link information such as traffic volume, speed, and delay. Trip tables show trip origin and destination activity and can be summarized and represented in informative graphics. Mode split outputs show, at an aggregate level, how people travel in the region using data like how many people use carpools, take transit, or drive single-occupant vehicles and is useful for illustrating summary statistics that can graphically display a region's characteristics.

RELIABLE RESULTS

- **LOADED NETWORK**: Amount of traffic, Type of Traffic, Determine any congestion issues, Congested travel times by time, Transit flow
- **TRIP TABLE**: Overall trip making activity, Travelers' origin and destination, Long-term patterns of trip making
- **MODE SPLIT**: Number of people moving around a region, How people travel together by vehicle, How people travel by transit, Mix of transportation modal infrastructure and capacity

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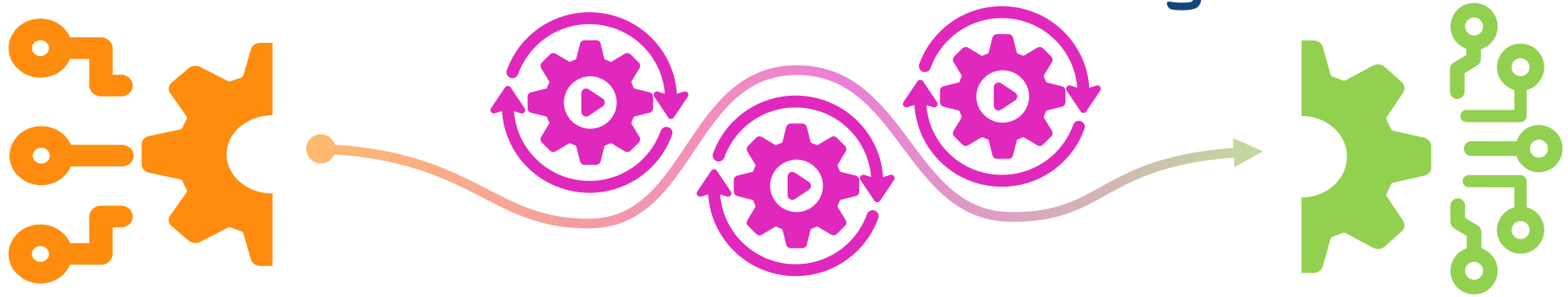
Value Principles
Travel Demand Modeling



ESTABLISHED DATA

Reliable data from reputable sources

PROVEN PROCESS

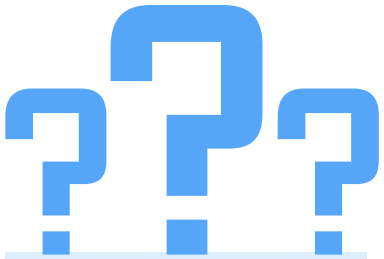
Standard forecasting and data analyses methodologies

RELIABLE RESULTS

Insights that support transportation decision-making

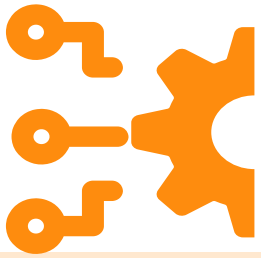
How Does a Model Work?

QUESTION



Where & How will people travel in the **FUTURE?**

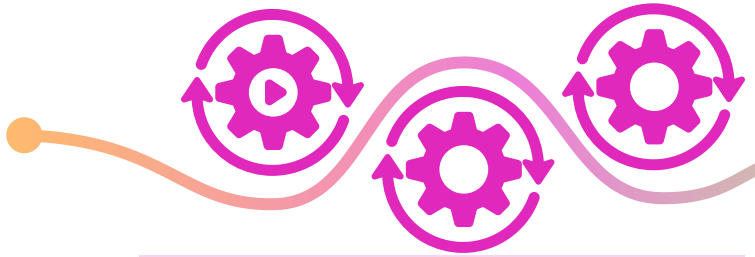
INPUTS



ESTABLISHED DATA

- Land use
- Transportation network
- Travel behavior

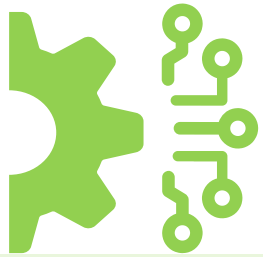
PROCESS



PROVEN PROCESS

- Model selection
- Verify and adjust
- Run alternate scenarios
- Analyze results

OUTPUTS



RELIABLE RESULTS

Future estimated travel behavior

Mission Overview

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TDM Manual

Overview of Travel Demand Models

Development

Application

Technical Specifications

Mission Overview

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