

Title: Model Documentation and Reports at NCTCOG

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Submission: Communicating Forecasts

North Central Texas Council of Governments (NCTCOG) has built the Dallas Fort Worth Regional Travel Model (DFWRTM) for executing model runs and creating forecasts. In our efforts to help people understand the logic behind the DFWRTM and the analyze the output of a model run, the Travel Model Development Group at NCTCOG produces the following documentation and reporting products:

- DFWRTM Model Description document,
- DFWRTM Application User Guide,
- DFWRTM Performance Report document,
- Regional Travel Model Calibration and Validation document,
- Model Run Flow Charts,
- Transit Reports,
- Performance Reports,
- Level of Service Map,
- Congestion Blob Map, and
- Travel Time Contour Map

DFWRTM Model Description

Document Type: Model Documentation

Potential Audience: In-house staff and Transportation Modelers

Description: The model description document describes the assumptions, formulas, and logic used in the Dallas Fort Worth Regional Travel Model. It also includes step-by-step instructions on how to run the model manually through the TransCAD interface.

Model Run Flow Charts

Document Type: Model Documentation

Potential Audience: In-house staff, Transportation Planners, General Public, and Transportation Modelers

Description: There are 3 model run flow charts: Full Model Run, Roadway Alternative Model Run and Transit Alternative Model Run flow charts. These charts show users the inputs and outputs at various stages of the model runs.

DFWRTM Application User Guide

Document Type: Model Documentation

Potential Audience: In-house staff, Transportation planners, and Transportation Modelers

Description: The application user guide document describes how to use the application user interface for DFWRTM. This application user interface provides a way for the user to run coding modules, execute a model run, and generate output reports from the model run. For each program or module, it describes the inputs needed for each module, how to enter data in each module, and the output of each module. The user guide document also describes the application menu, the underlying folder structure, and the metadata system.

DFWRTM Performance Report

Document Type: Model Documentation

Potential Audience: In-house staff, Transportation Planners, General Public, and Transportation Modelers

Description: The performance report document is used to provide the name, description, and formulas used to calculate the values in each of the 12 sections of the model output performance report. It also contains the description and formulas of the expanded roadway fields generated with the performance report.

Regional Travel Model Calibration and Validation

Document Type: Model Documentation

Potential Audience: In-house staff, Transportation Planners, General Public, and Transportation Modelers

Description: The calibration and validation document describes the calibration of the model with census data, survey data, and count data and the validation of the model output.

Performance Reports

Document Type: Model Output

Potential Audience: In-house staff, Transportation Planners, General Public, and Transportation Modelers

Description: The performance reports are created automatically after a model run for the entire modeling area as well as by county. The performance report contains 12 sections which summarize matrices and tables created during a model run. These sections include documentation of Demographics, trips by trip purpose, vehicle occupancy, and performance measures including Vehicle Miles Traveled, Vehicle Hours Traveled, and Average Speed. In addition to the default county reports, the performance reports may be created for other defined areas such as Traffic Analysis Zones (TAZs), districts, cities, and user-defined study areas.

An expanded roadway file is generated at the same time as the performance report. It contains commonly requested fields for each link. These fields include volume by mode, direction, and time of day; hourly volume; daily volume; hourly volume over capacity; level of service; peak hour travel time; and peak hour speed. This information can easily be viewed on a roadway network map to assist in analyzing the output.

Transit Reports

Document Type: Model Output

Potential Audience: In-house staff, Transportation Planners, General Public, and Transportation Modelers

Description: The transit reports are created automatically after a model run for the entire transit system. The transit reports consist of 3 report sets: transit summaries, mode of access reports, and transit link flow plot fields. The Transit Summaries include two reports: the transit summary report and the transit summary report daily. The transit summary report provides information about boardings, trips, vehicle miles, vehicle hours,

and coded stops by mode. The transit summary report daily provides an executive summary of the transit system including information about physical stops, park-and-ride stations, rail stations, nodes, and population and employment near a transit stop, rail station, and park and ride lot.

The mode of access reports are a set of six reports which summarize the boardings and alightings for each stop, line, route, node, mode, and agency. A 7th report is also provided which lists the correspondence between line, route, node, mode, and agency.

The transit link flow plot fields are flow fields which are added to the roadway network file. They are populated with the flow on each link in the AB and BA direction for the link, as well as broken down by mode. This information can easily be viewed on a roadway network to develop a transit link flow plot.

Level of Service Map

Document Type: Model Output

Potential Audience: In-house staff, Transportation Planners, General Public, and Transportation Modelers

Description: The level of service map is created by using the level of service fields in the roadway network file to generate a color-coded map. These are useful in helping the potential audience understand the level of service (ABC, DE, and F) for various roadways in the modeling area.

Congestion Map

Document Type: Model Output

Potential Audience: In-house staff, Transportation Planners, General Public, and Transportation Modelers

Description: The congestion map is created using the fields in the roadway network file to create a color-coded map. These are useful in helping the potential audience compare the level of congestion of different TAZs in the modeling area and compare the changes in the level of congestion in different modeling years or scenarios.

Travel Time Contour Map

Document Type: Model Output

Potential Audience: In-house staff, Transportation Planners, General Public, and Transportation Modelers

Description: The travel time contour map is created using the model output to generate a color-coded map. These are useful in helping the potential audience compare the travel times from a specific area.

To illustrate our documentation products, we are providing copies of the Full Model Run Flow Chart, the DFWRTM Performance Reports document, a sample Performance Report, a sample Mode of Access Report, a sample Transit Link Flow Plot, a Level of Service Map, a Congestion Map, and a Travel Time Contour Map. Copies of other documents can be provided upon request.