

Chapter 4 – Projected Transportation Demand

The Dixie MPO Travel Demand Model was created in 2010 using the CITILABS CUBE Model platform to forecast future traffic demands throughout Washington County. The computer-based planning platform allows the MPO to better predict traffic movements based on our unique terrain, environment, and land-uses. A rigorous effort to calibrate and validate the model and update socio-economic data has followed since 2010 to assure the model includes the best information available. The CUBE model is the platform also used by the Utah Department of Transportation and other MPO's within Utah.

In 2013 and again in 2018-2019, and most recently in 2022 – the Dixie MPO commissioned an extensive update of the Dixie MPO Travel Demand Model. This recent update is a major effort in bringing the model to the most currently used platforms as used throughout the state. This work includes updating the model structure, updating the model supply-side data and model calibration/validation of each model step. The update incorporates revised Traffic Analysis Zones, recent Population and Household data, updated Employment data, University and School data and many other supply-side data requirements. The 2020 Census, and other population estimates were used in the update. Calibration /Validation will be done to meet UDOT and industry standards. This version of the Dixie MPO Travel Demand Model is scheduled to be fully complete in 2023.

Model Structure

Travel demand models are computer-based mathematical models that use socioeconomic and roadway network, local geometry, and land use data to forecast traffic under various scenarios. To forecast traffic the Dixie Travel Demand Model uses the traditional 4-step process. The four basic phases are:

1. Trip Generation – Trip generation determines how many trips are made in a region. To simplify the process, large geographical areas are broken up into smaller areas called traffic analysis zones (TAZ). Using information from sources like the Census Bureau and city land use plans, each TAZ is given certain attributes such as the number of households, employees, and average income levels. These attributes are then used to calculate the number of trip productions and attractions for each TAZ.
2. Trip Distribution – Trip distribution determines where the trips are going. Trip productions and attractions from different TAZ's are linked together using a gravity model to form origin-destination patterns. The gravity model states that the trip attraction between two zones is proportional to the size of the zones (number of households/employees) and the distance between them.
3. Mode Choice – What modal method of reaching a trip's destination is determined in step 3. Looking at factors such as cost, convenience, and travel time it is determined if the trip will be made by walking, transit or vehicle.
4. Trip Assignment – The route the trip will take to reach its destination is then determined. Link attributes contained in the highway network such as capacity and travel speed are used to determine the shortest travel path to a destination. The trips are then assigned to the roadway network.

Each step of the process is calibrated to observed travel behavior. Base model forecasts are checked against observed traffic counts to ensure reasonable accuracy. Once the model is developed so that it replicates existing travel behavior, it is then used to evaluate future scenarios and alternatives.

Socio-Economic Characteristics

In addition to population growth, the characteristics of population distribution within the MPO are vital considerations in the development of a viable transportation network. More than 88% of the Washington County population resides within the Dixie MPO census defined "Urban" boundaries. Other, more rural, cities and towns within the County include Apple Valley Town, Enterprise City, Hildale City, New Harmony Town, Rockville Town, Springdale Town, and Virgin Town as well as unincorporated County.

The distribution of the current population and projected growth are illustrated on Map 3 "Population Change Map" in Appendix B at the back of this plan. The mapping includes a 2018 population distribution and the future population of projected growth areas through 2050.

Employment and Commuting

Over 7,500 employment establishments were operating in Washington County in 2021 (see Appendix A for table of major employers). More than 98 of these establishments had over 100 employees, according to the Utah Division of Workforce Services. The highest demand for transportation facilities and services comes during the morning and evening commutes as people travel from home to work and back. Companies come and go, and seasonal peaks in tourism and retail activity affect the number of commuters.

As of 2022 Washington County growth dynamics remain strong including employment expansion. September 2022 Year-to-Year change in Nonfarm Jobs increased over 3,200 jobs with all sectors increasing except for Financial Activities, it is anticipated that additions to the county's employment base will continue to strengthen Washington County's economic and growth numbers in the months ahead. As growth continues, so too will the need for adequate transportation facilities.

Objectives and Goals

To plan for future transportation demands, the Dixie MPO will strive to meet necessary goals and objectives to recognize the impacts of the area growth on transportation.

Objective

To recognize population growth and land uses as the key drivers of future transportation demand.

Goals

1. Stay abreast of changes in population growth and projections in the area.
2. Be aware of changes in land development patterns and how those changes affect population growth and transportation demand.

3. Stay current on socio-economic factors and changes that may affect the demand for transportation.
4. Provide for regular updates of the Transportation Demand Model and look for opportunities to update the model within localized studies.
5. Keep up with Model platform updates and changes in technology that can improve the accuracy of the Transportation Demand Model.
6. Become more educated and efficient in the execution and use of the Transportation Demand Model in keeping the model current and useful to the Dixie MPO and its partners.