North Front Range Metropolitan Planning Organization

Land Use and Travel Demand Models Fact Sheet

Forecasting the Future

What will the North Front Range region look like in 2045 and how will the transportation system function? Which transportation projects do we need to plan today to meet the needs of our fast-growing region? These important questions are addressed through the land use and transportation forecasts developed by the NFRMPO to inform the priorities in the 2045 Regional Transportation Plan (RTP).

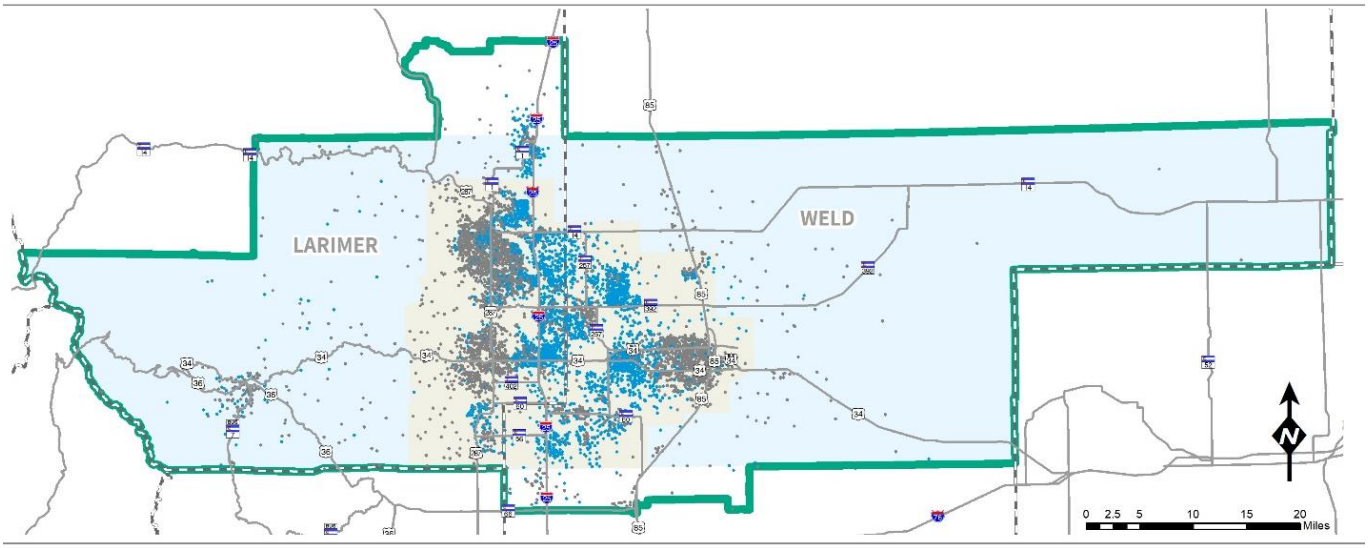
Land use and travel demand models, developed through a collaborative regional process, forecast development patterns and the resulting impact on the transportation system.

Every four years the NFRMPO completes a new RTP and a major part of this effort is developing land use and travel demand models using the latest data and assumptions. The land use and travel demand models cover the NFR Modeling Area, which includes the NFR Metropolitan Planning Area (MPA) and additional portions of Larimer and Weld counties within the Northern Subarea of the Denver-North Front Range 8-hour Ozone Nonattainment Area.

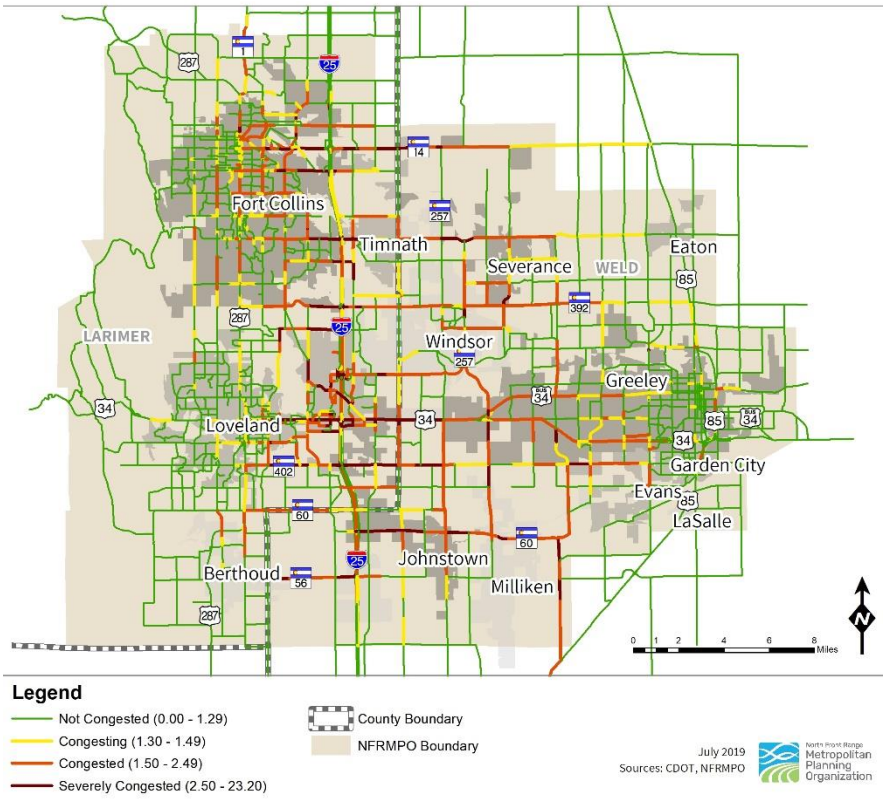
A Fast-Growing Region

According to the State Demography Office (SDO), the population within the NFR Modeling Area is expected to increase by 84 percent between 2015 and 2045, from 536,000 to 987,000 residents. The land use model forecasts most of this growth will occur in the center of the region between incorporated communities. The map below displays this growth with each blue dot representing 50 additional households by 2045 and each gray dot representing 50 households in 2015. The SDO estimates the number of jobs will increase by 67 percent between 2015 and 2045. The land use models forecasts a more even distribution of job growth across the region as compared to household growth.

Household Growth Forecast, 2015-2045



Forecasted Congestion, 2045



Future Travel Demand

The travel demand model forecasts increased congestion and increased Vehicle Miles Traveled (VMT) per capita in 2045 compared with 2015, along with a higher percentage of trips taken by transit. Within the North Front Range region, 7.1 percent of the roadways are forecast to experience congestion during peak travel periods in 2045, compared with 0.8 percent of roadways in 2015. As shown in the map, many of the roads connecting the region's municipalities are forecasted to be congested in 2045.

Several scenarios were tested with the land use and travel demand models to assess how different land use patterns and different sets of transportation projects would impact the transportation system. The transportation projects included in the fiscally constrained 2045 RTP provide the most congestion relief of the tested scenarios, except for the fiscally unconstrained scenario and the high-density land use scenario.

Model Nuts and Bolts

The land use model uses the population, household, and employment forecasts developed by the SDO combined with Census data, planned developments, local zoning, and comprehensive land use plans to forecast the location and timing of growth throughout the Modeling Area at the Census Block level. The land use model was built using the UrbanSim microsimulation model platform, UrbanCanvas.

The travel model uses the outputs from the land use model; information about the current transportation system, including traffic volumes, transit ridership, speeds, and travel behavior; and proposed transportation projects to forecast how the transportation system will function in the future. The forecast includes traffic volume, transit ridership, mode choice, origins and destinations, and congested travel time, among other indicators.

The two models were developed in consultation with the Model Steering Team (MST) comprised of members of the NFRMPO Technical Advisory Committee (TAC) as well as land use planners and other staff from jurisdictions within the NFRMPO Modeling Area.

How to Learn More

You can learn more about the models and request model data by visiting https://nfrmpo.org/modeling/.