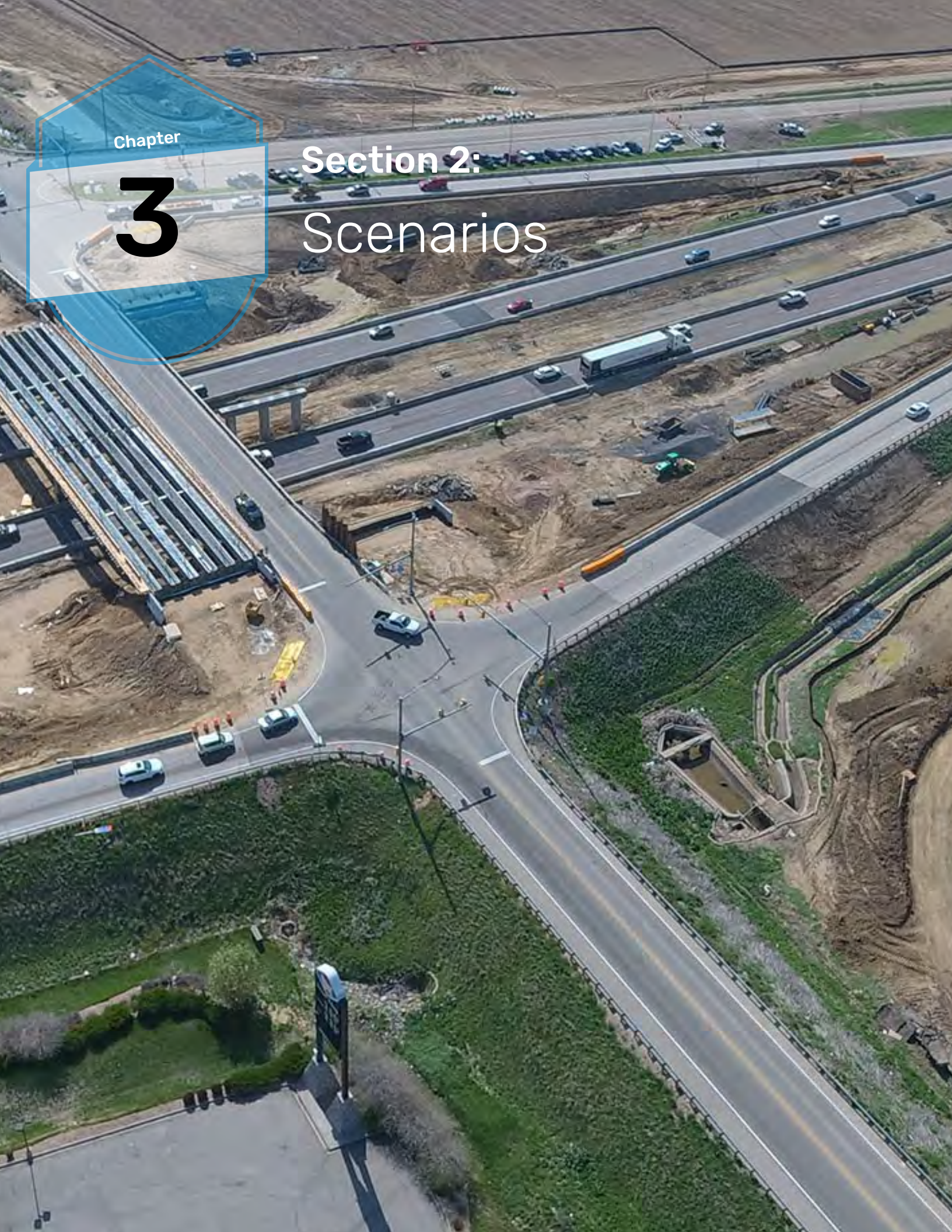


Chapter

3

Section 2:

Scenarios

Forecasts and Scenarios

Although the NFRMPO establishes a baseline scenario based on fiscal constraint and feedback from member communities, the NFRMPO uses other scenarios to understand the impact of different policy decisions on the region's transportation system and needs. The NFRMPO uses the Land Use Allocation Model (LUAM) and the Regional Travel Demand Model (RTDM) to forecast differences in key milestones, like Level of Service, Travel Time Index, and vehicle miles traveled (VMT). These types of analyses can also help the NFRMPO understand how its prioritization impacts the performance measures discussed in **Chapter 2**.

In addition to the scenarios discussed in this section, the NFRMPO also established scenarios for the Greenhouse Gas (GHG) Transportation Report, a State requirement. The strategies for the GHG Transportation Report are included in **Appendix B**.

Land Use Scenarios

The baseline scenario is explained in **Chapter 2** and is based on data from the State Demography Office, local communities, and the UrbanSim platform.

One land use scenario was prepared for the 2050 RTP to compare it to the baseline scenario. The scenario increased allowable densities within certain zoning districts and manual increases in population by growing the 2050 numbers by 25 percent. The high-density scenario was created to demonstrate how the region would develop if additional density was allowed in urban core areas compared to the density currently identified in communities' long-range plans. Manual increases in population happened in areas roughly based on the urban core areas identified in the 2045 RTP. These areas were identified based on locations with the highest density in 2015 and roughly align to the central portion of the region. To accommodate additional growth, the maximum allowable densities in the urban core were doubled in the high-density scenario. Household and jobs results for the High-Density Scenario are shown in **Figure 3-4** and **Figure 3-5**.

Compared to the baseline scenario, the high-density scenario forecasts more and denser development within the core. Development in the rural area is located predominantly along major highway corridors, while the influx of new development and jobs is along major corridors.

Outputs from the High-Density Land Use Scenario were used as an input for the High-Density Land Use – Fiscally Constrained Projects scenario, explained in the following sections.

Figure 3-4: 2050 High Density Households

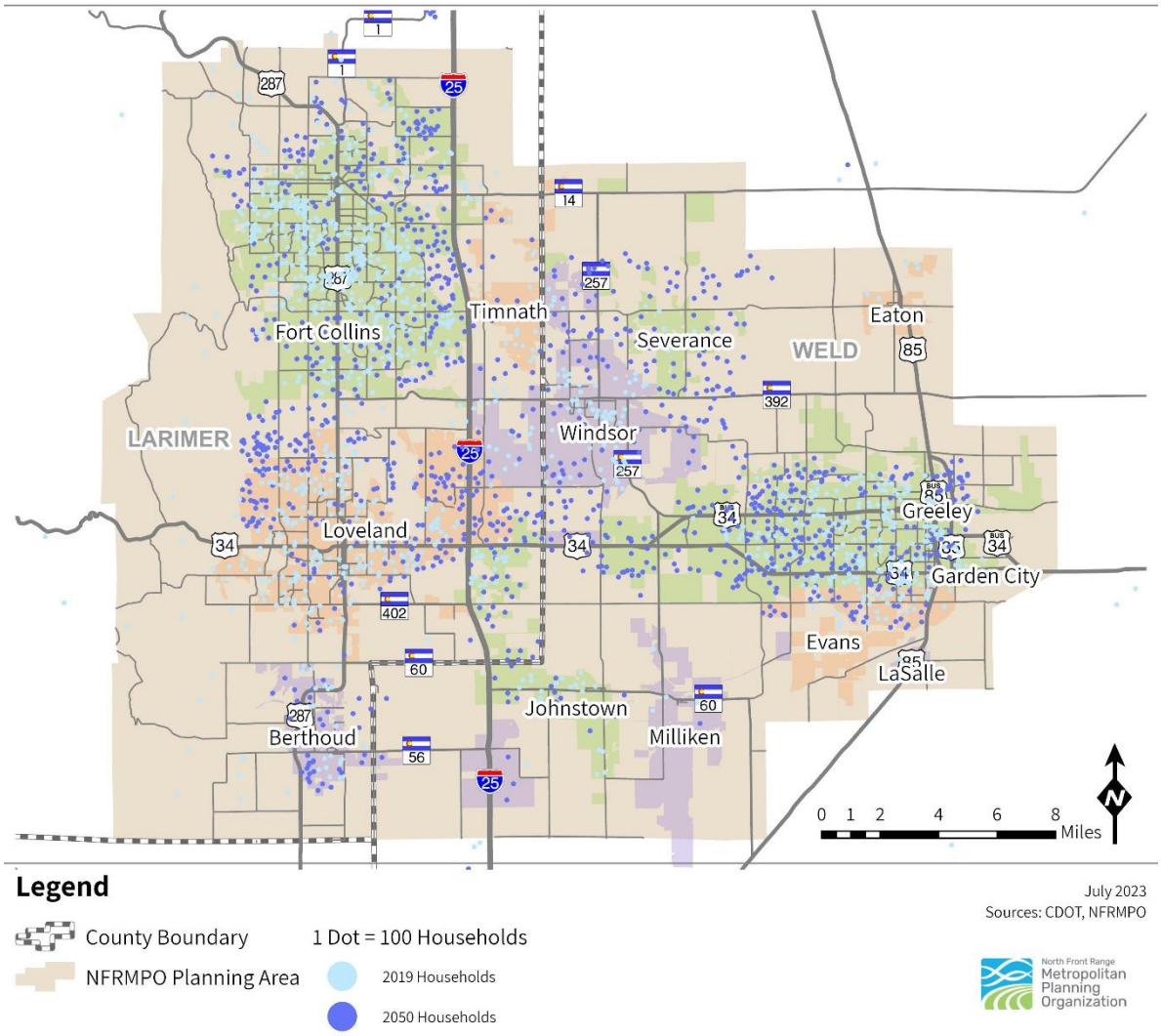
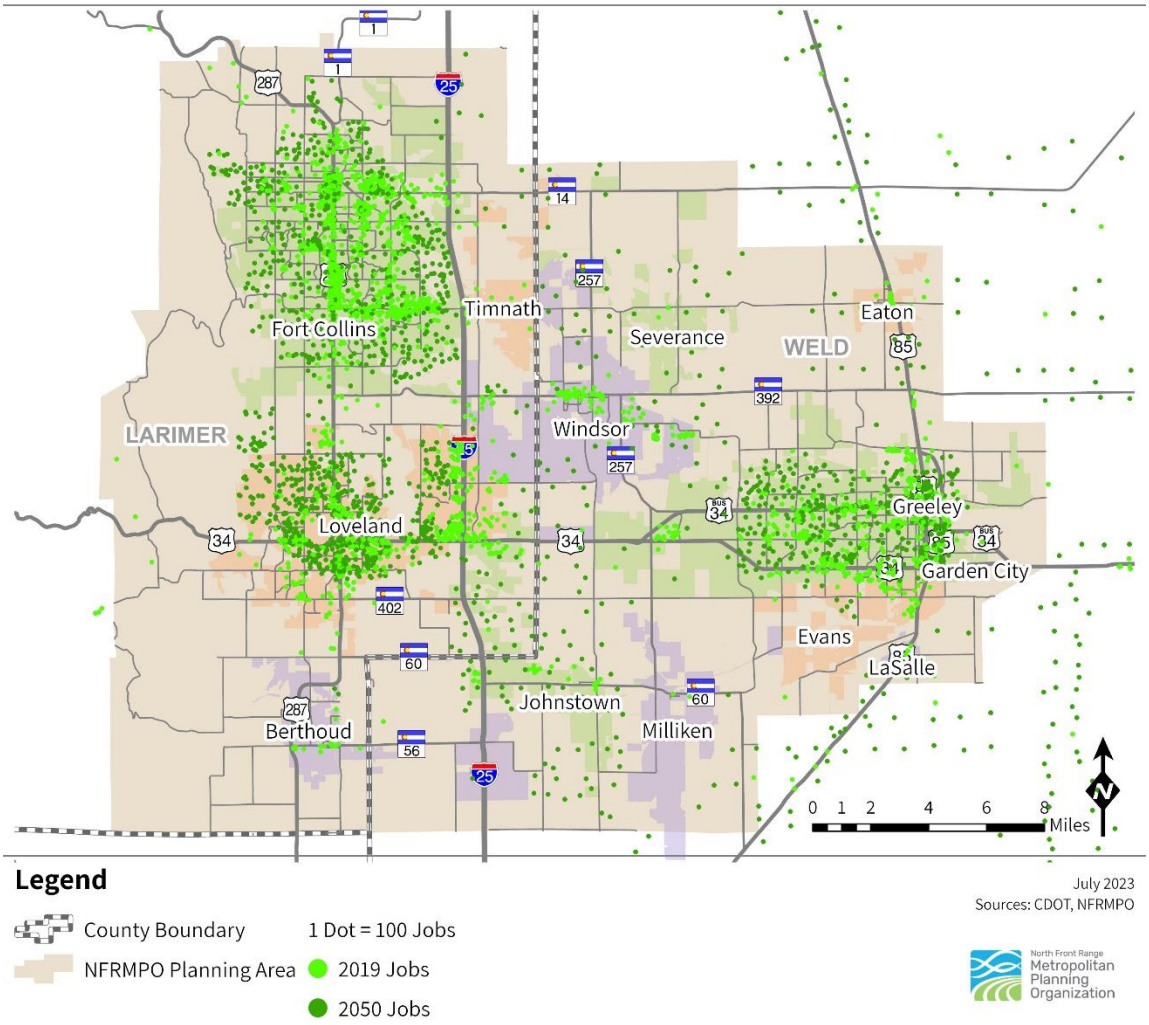


Figure 3-5: 2050 High Density Jobs



Transportation Scenarios

The 2019 RTDM builds upon the outputs from the LUAM to identify how the region's transportation system will perform in 2050, including traffic volume, congested travel speeds, and transit ridership. The 2019 RTDM uses a base year of 2019 and a combination of destination choice and gravity modeling to forecast travel choices by trip purpose.

Four transportation scenarios were developed using the 2019 RTDM, including the baseline scenario and three specific scenarios. The baseline scenario forecasts the transportation system using the fiscally constrained priority transportation projects and guidance from local communities. The alternative investment scenarios test the following investment options:

- **No Build** – No additional transportation investments from 2023 through 2045, beyond what is already under construction.
- **Fiscally Unconstrained** – All identified projects regardless of available funding
- **Fiscally Constrained and Higher Density Land Use** – Projects with anticipated funding based on a higher density scenario

A comparison of results for certain performance metrics are shown in **Table 3-1**.

Baseline Transportation Scenario

The baseline transportation scenario represents the expected transportation system in 2050 and includes the fiscally constrained, regionally significant projects identified in the Financial Plan. Compared to the 2019 network, the fiscally constrained 2050 network includes roadway widenings, new roads, and newly paved roads, as well as additional transit routes and bicycle and pedestrian infrastructure.

The number of lanes in the 2050 fiscally constrained roadway network are displayed in **Figure 3-6**.

Level of Service (LOS) is a qualitative measure of how well the roadway serves traffic. LOS ranges from a score of A, which is free-flow traffic, to a score of F, which is stop-and-go traffic that is poorly served by the roadway's capacity. LOS is shown in **Figure 3-7**, with the central portion of the region having the most LOS F.

The Travel Time Index (TTI), a measure of congestion that compares travel time during the peak period to free-flow conditions, is forecasted to be higher in 2050 than in 2019. As defined in the 2023 Congestion Management Process (CMP), a TTI of 1.5 or higher is indicative of congestion.

Figure 3-8 shows the TTI for each RSC, with US34, SH402, and SH56 having the highest TTIs in the region.

Table 3-1: Scenario Metrics Comparison

	Baseline	No Build	Fiscally Unconstrained	High Density/Fiscally Constrained
Vehicle Miles Traveled (VMT)	19,020,700	19,537,644	19,546,470	18,519,574
Vehicle Hours Traveled (VHT)	570,784	605,562	559,419	552,488
Vehicle Hours of Delay	103,612	125,374	83,011	93,338
Percent of RSCs with TTI >= 1.5	12.3%	16.9%	5.8%	8.1%
Percent of RSCs with LOS F	30.7%	35.9%	23.1%	27.8%
Person Miles Traveled	23,914,430	23,976,599	24,014,940	22,611,887
Person Hours Traveled	729,226	758,498	702,604	691,216
Average Speed (MPH)	33.3	32.3	34.9	33.5

Figure 3-6: Baseline and High Density Scenario Number of Lanes by RSC, 2050

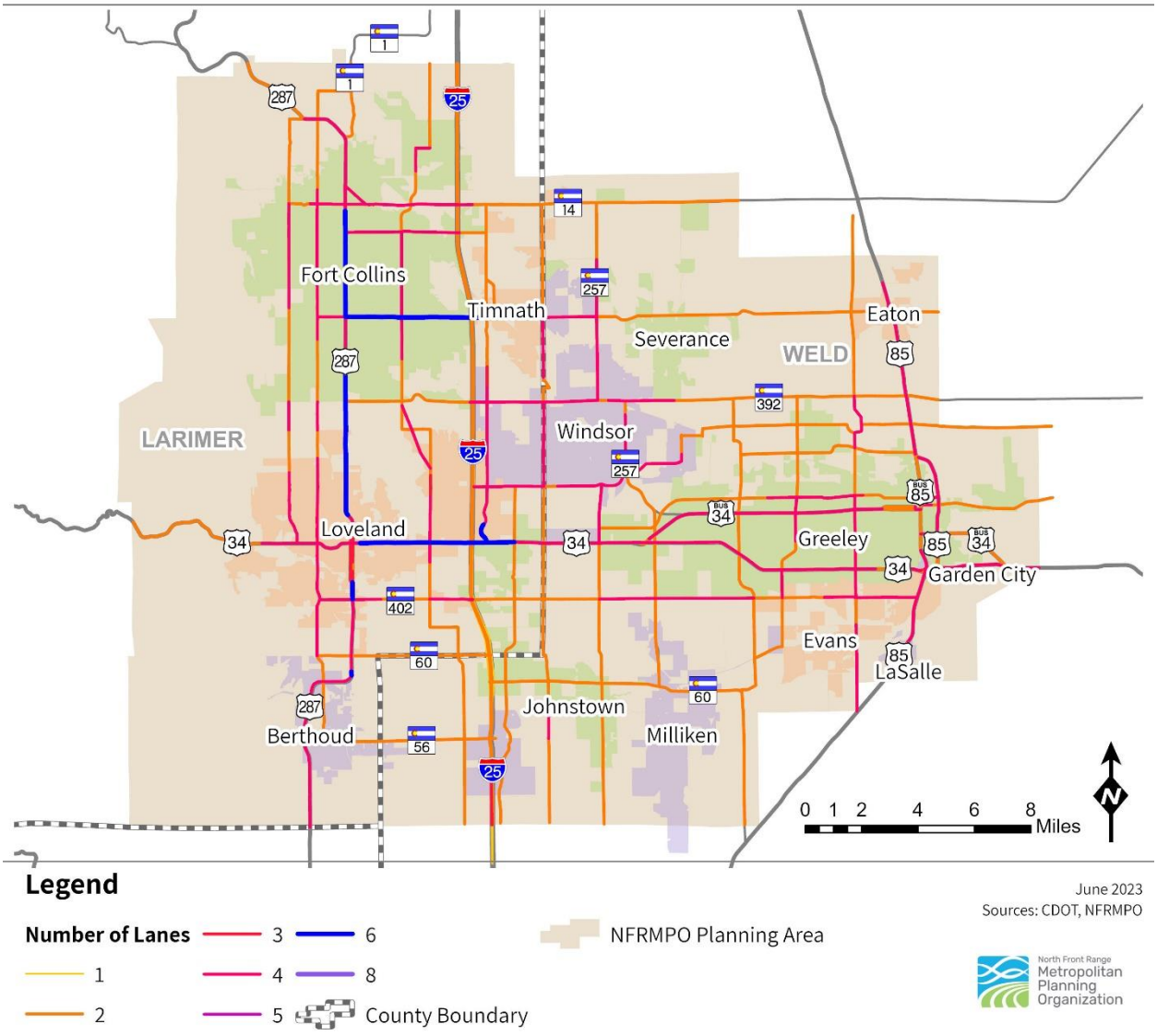


Figure 3-7: Baseline Scenario Level of Service (LOS) by RSC, 2050

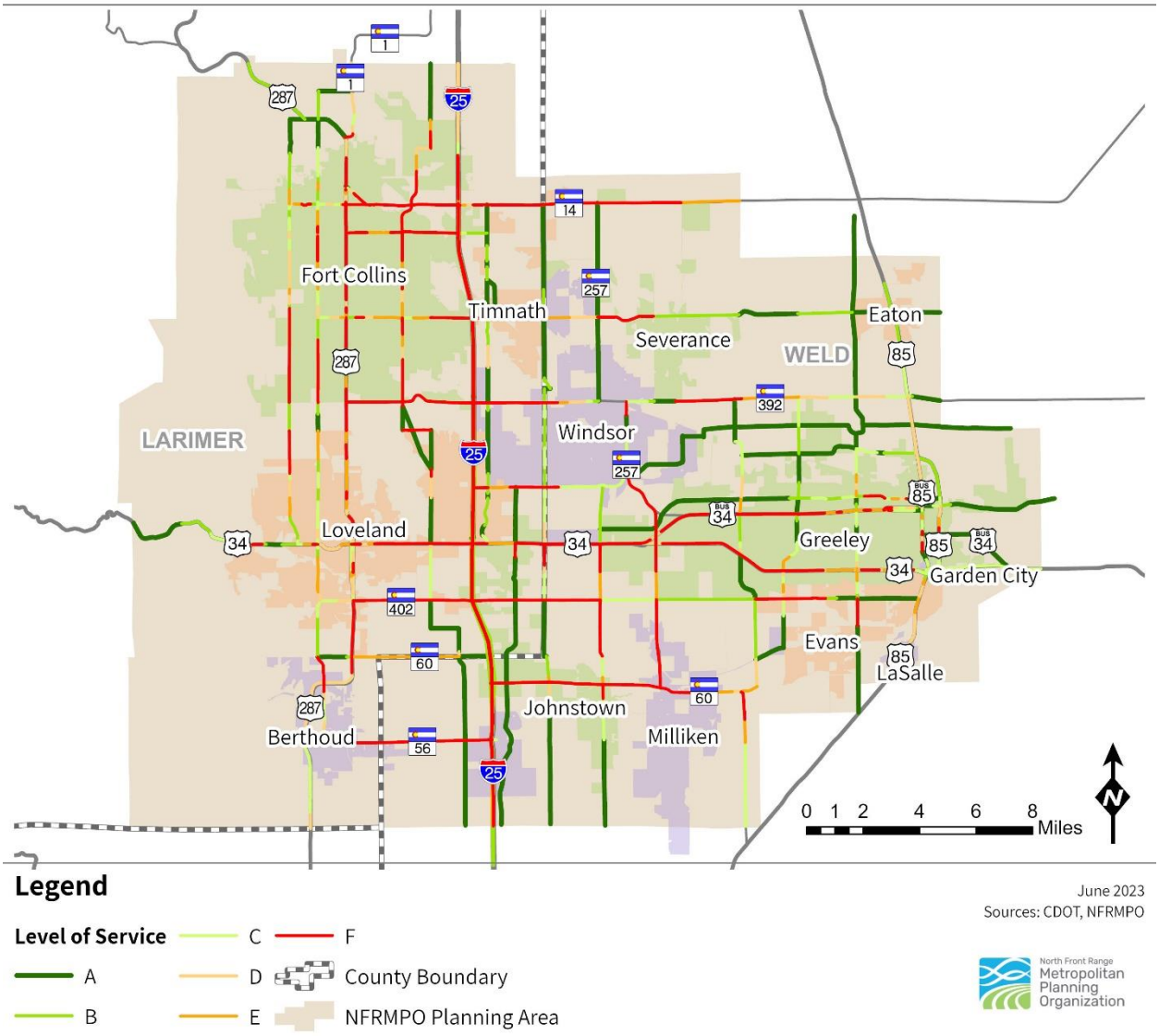
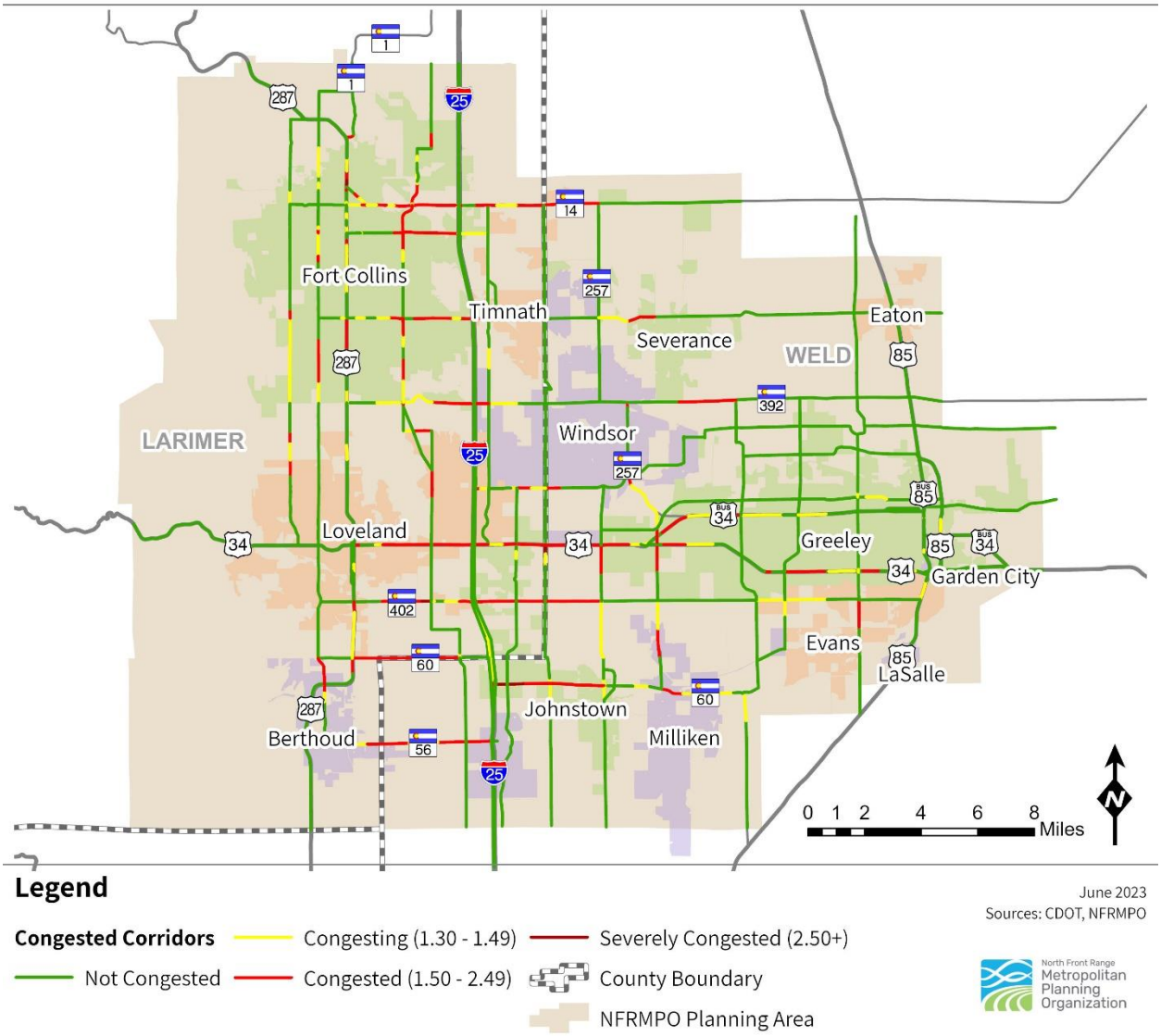


Figure 3-8: Baseline Scenario Travel Time Index (TTI) by RSC, 2050



Alternative Transportation Scenarios

The alternative investment scenarios vary the most according to the percentage of the RSCs with LOS F with the Fiscally Unconstrained Project scenario having the lowest percent. The No Build Scenario has the highest percent, reflecting the lack of investments and rapid growth in population. The High Density-Fiscally Constrained Project Scenario has the lowest VMT and PMT of the scenarios, reflecting the potentially shorter trips accomplished in higher density areas.

Other measures of delay, such as vehicle hours of delay, percent of system with TTI greater than or equal to 1.5, and person hours of delay also vary substantially among the alternative investment scenarios. Distance traveled as measured by VMT and person mile traveled do not vary substantially among the scenarios.

The RTDM forecasts mode choice with five key categories: Drive Alone, Carpool (at least two people per vehicle), Walking, Biking, and Transit. **Table 3-2** shows the mode choices by scenario. Drive Alone is consistent across the top, recognizing a lack of further investment in transit or bicycle and pedestrian projects. Carpooling remains consistent in all four scenarios.

Table 3-2: Mode Choice by Scenarios, 2050

Mode	Baseline	No Build	Fiscally Unconstrained	High Density-Fiscally Constrained
Drive Alone	45.9%	49.1%	49.0%	49.0%
Carpool	39.0%	38.8%	38.8%	38.3%
Walk	10.7%	8.0%	8.0%	8.4%
Bike	4.3%	3.5%	3.5%	3.7%
Transit	0.1%	0.7%	0.7%	0.6%

Figure 3-9 and **Figure 3-10** show the number of lanes by RSC for the No Build Scenario and the Fiscally Unconstrained Scenario. The number of lanes for the High-Density Scenario is the same as the Baseline, **Figure 3-6**. The most notable difference in the number of lanes between the two scenarios is the number of lanes along I-25.

Figure 3-9: No Build Scenario Number of Lanes by RSC, 2050

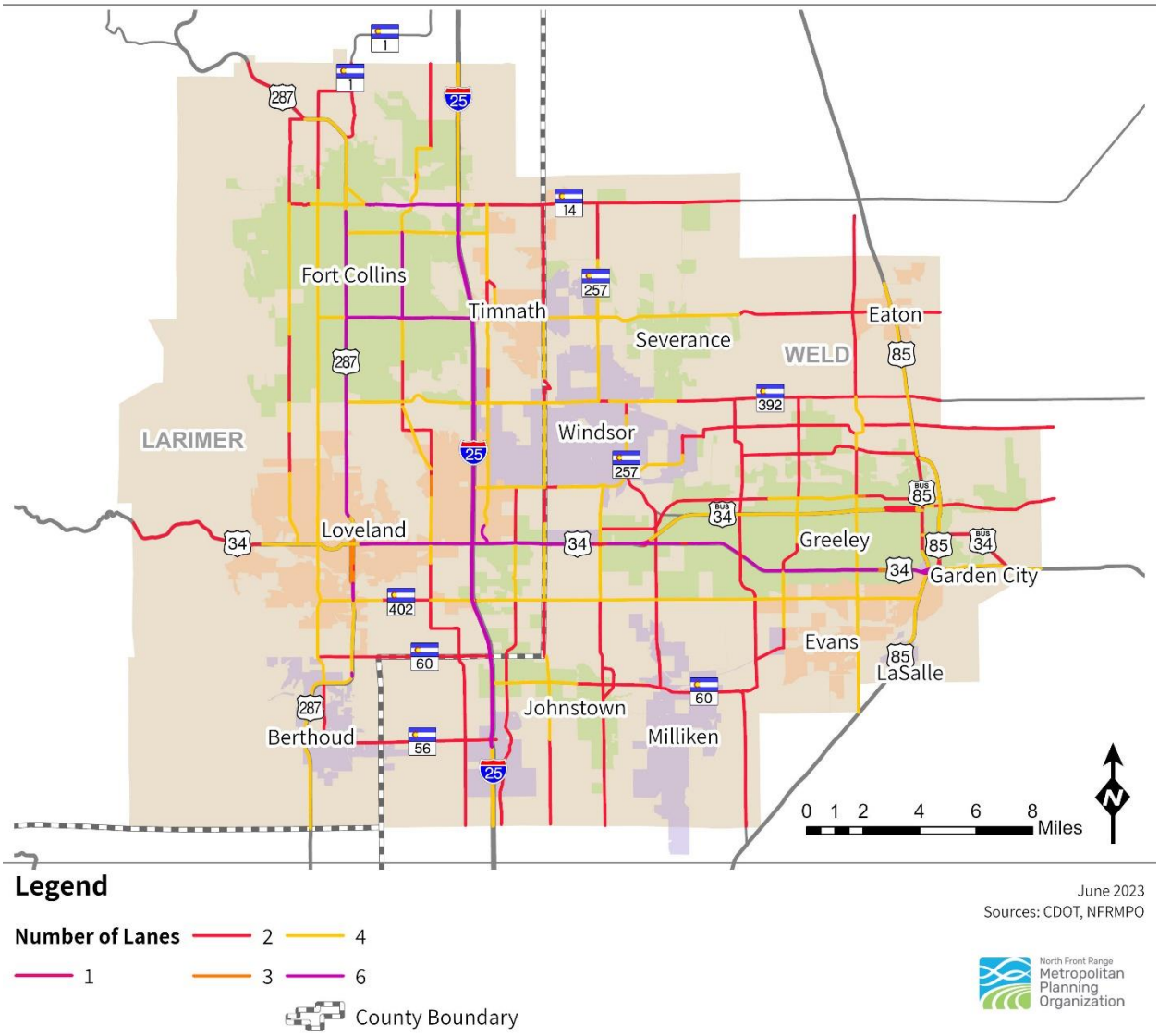
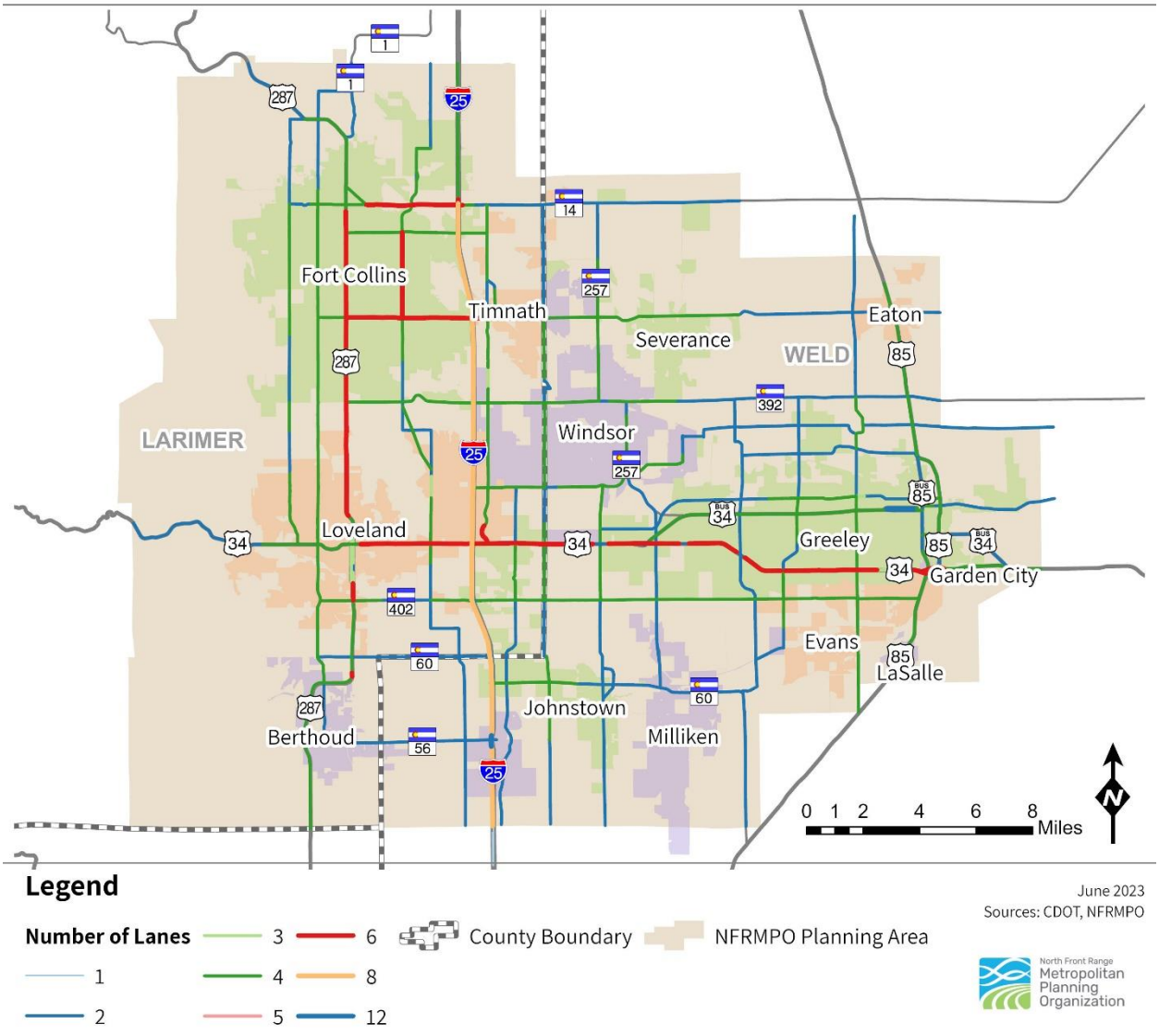


Figure 3-10: Unconstrained Scenario Number of Lanes by RSC, 2050



LOS has become an antiquated measure but still allows a broad understanding where roadway capacity can and cannot handle volumes. Looking at person-miles traveled, and vehicle miles traveled can give further context about alternative transportation options being used, as a full base will have fewer VMT but greater PMT. **Figure 3-11**, **Figure 3-12**, and **Figure 3-13** show LOS by Scenario.

The No Build scenario has the highest ratio of RSCs with an LOS F, resulting from no further investments in transit, bicycle and pedestrian infrastructure, or roadway capacity. The Fiscally Unconstrained has the most LOS A, resulting from the increased investments, while the High-Density Scenario has more moderate LOS. Across all three scenarios, areas with the lowest LOS are located near interchanges with I-25 or US34, two of the central corridors within the region.

Figure 3-11: No Build Scenario Level of Service (LOS) by RSC, 2050

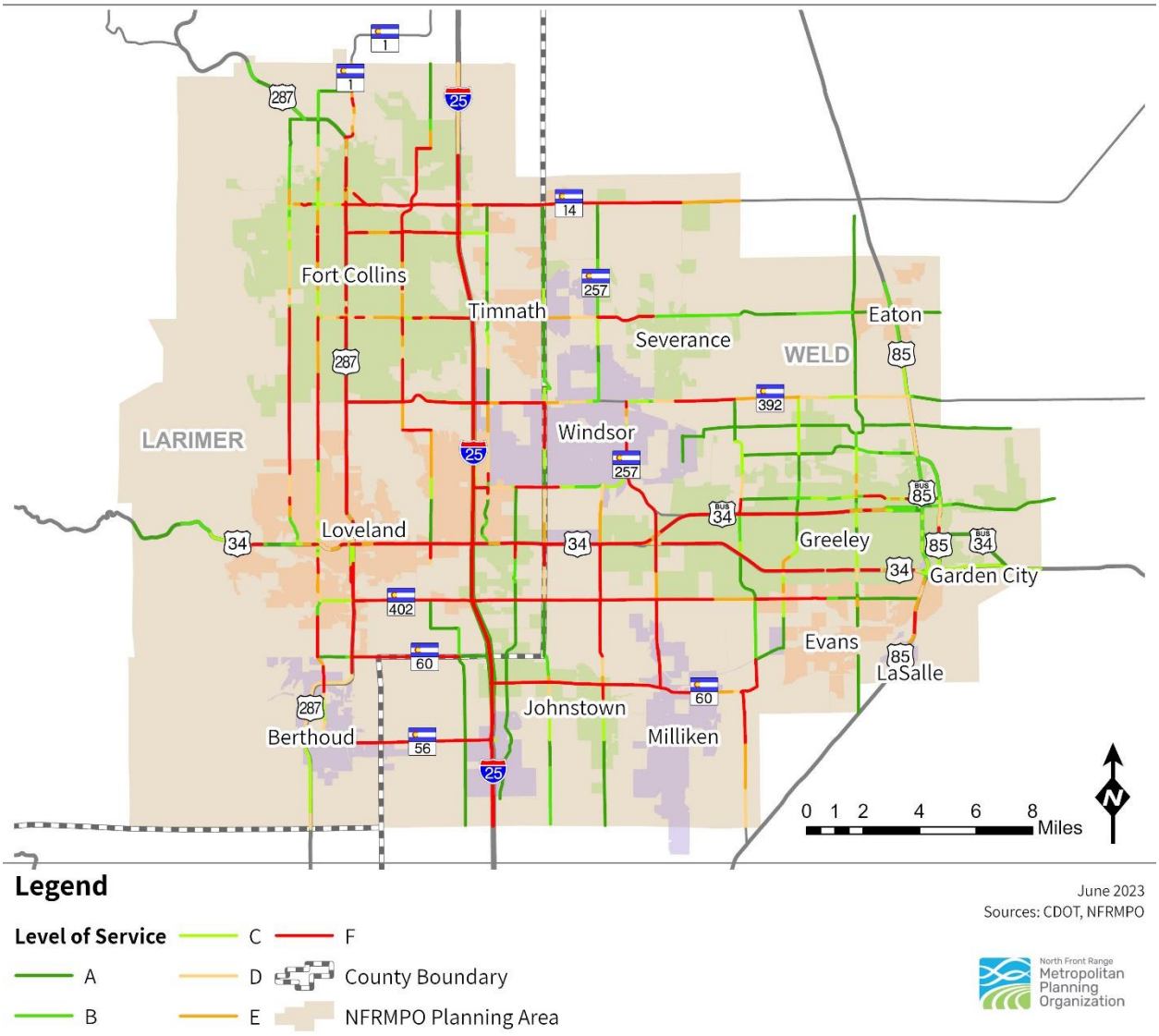


Figure 3-12: Fiscally Unconstrained Scenario Level of Service, 2050

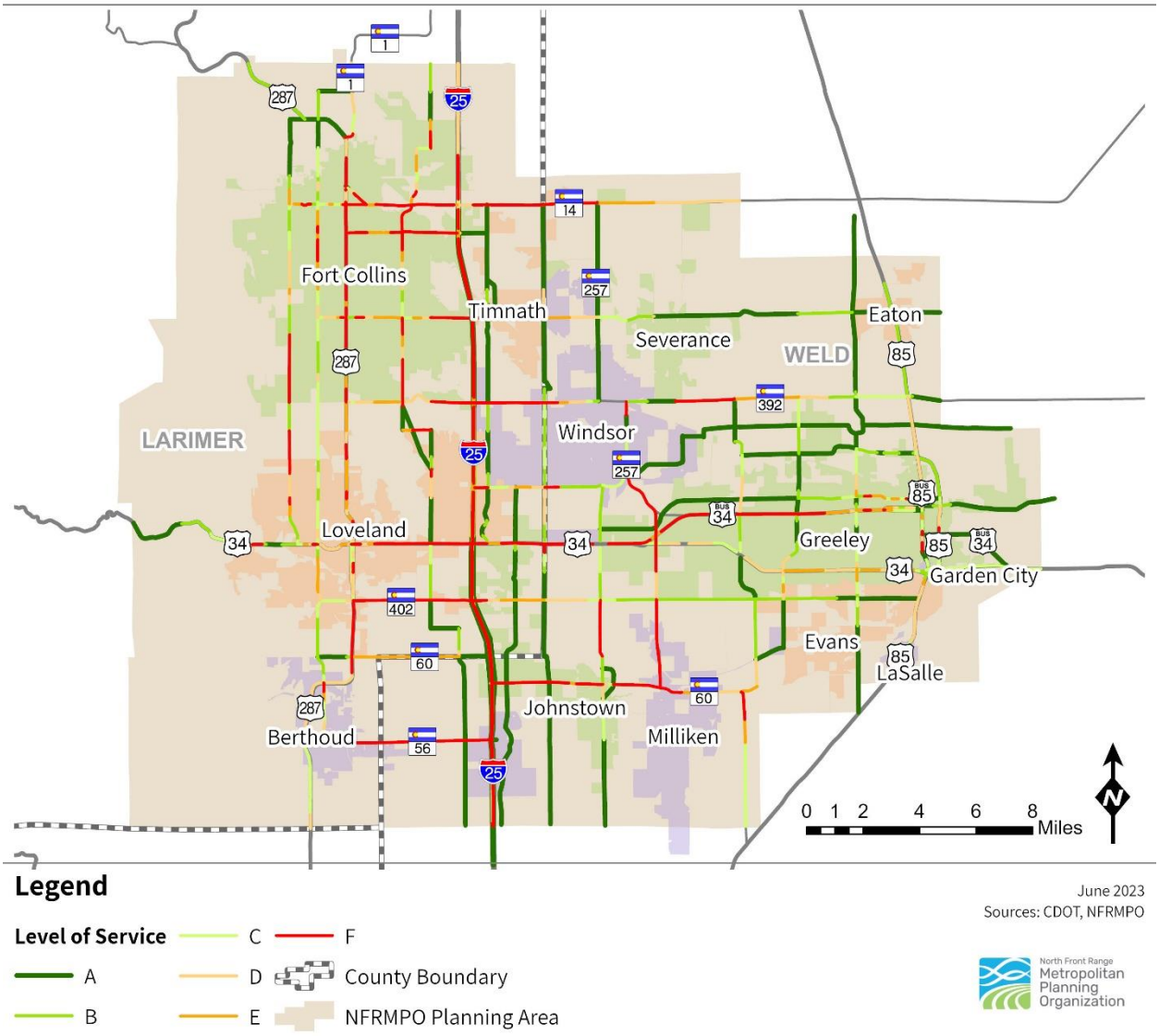


Figure 3-13: High Density Fiscally Constrained Scenario Level of Service, 2050

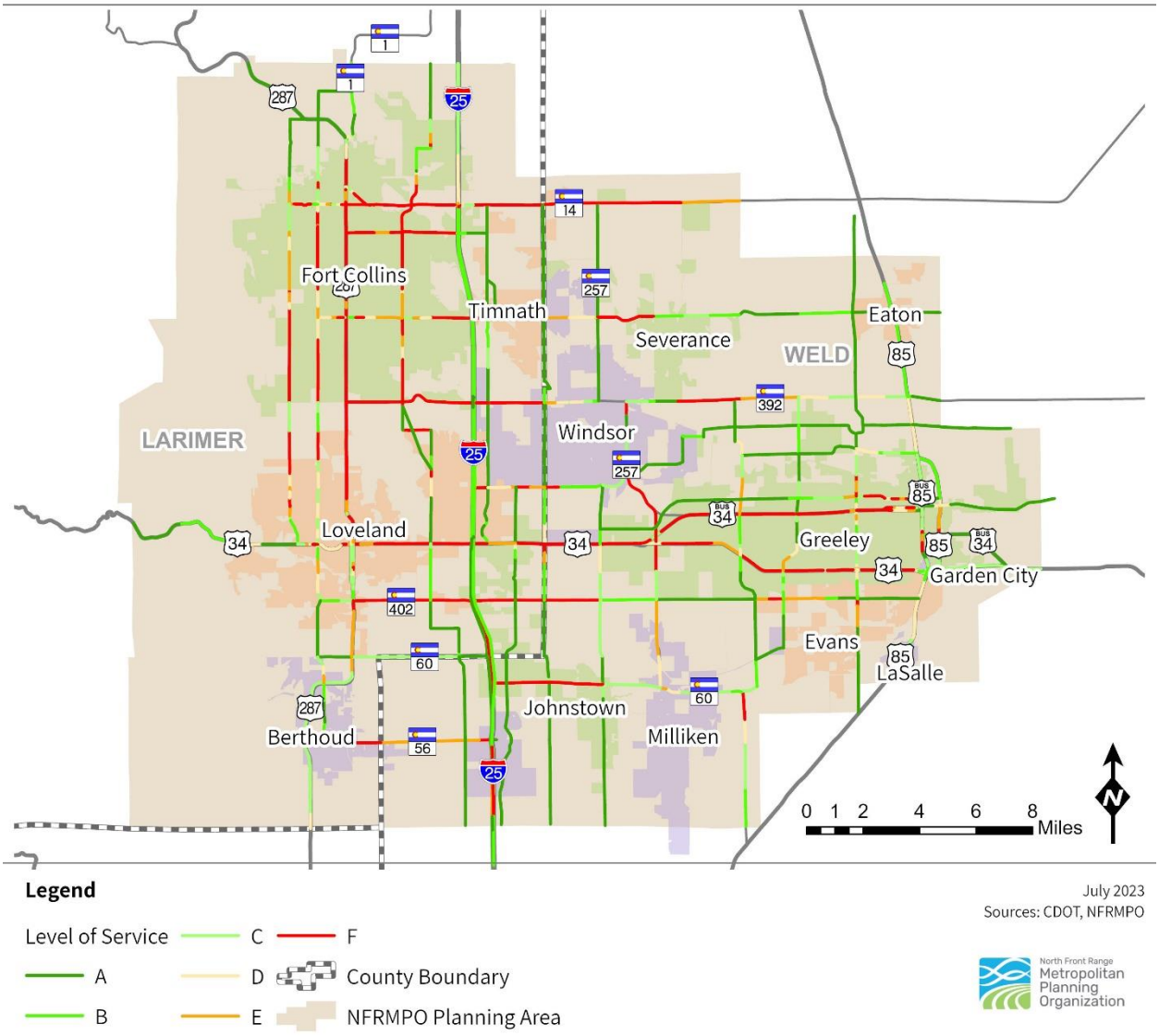


Figure 3-13, **Figure 3-14**, and **Figure 3-15** show TTI by RSC for the three scenarios. Consistent areas across the three scenarios with higher TTIs, or more congestion, are along US34, SH14, SH56, and SH60. These corridors are direct connections to I-25 and are also major thoroughfares for anticipated development.

Figure 3-14: No Build Scenario Travel Time Index (TTI) by RSC, 2050

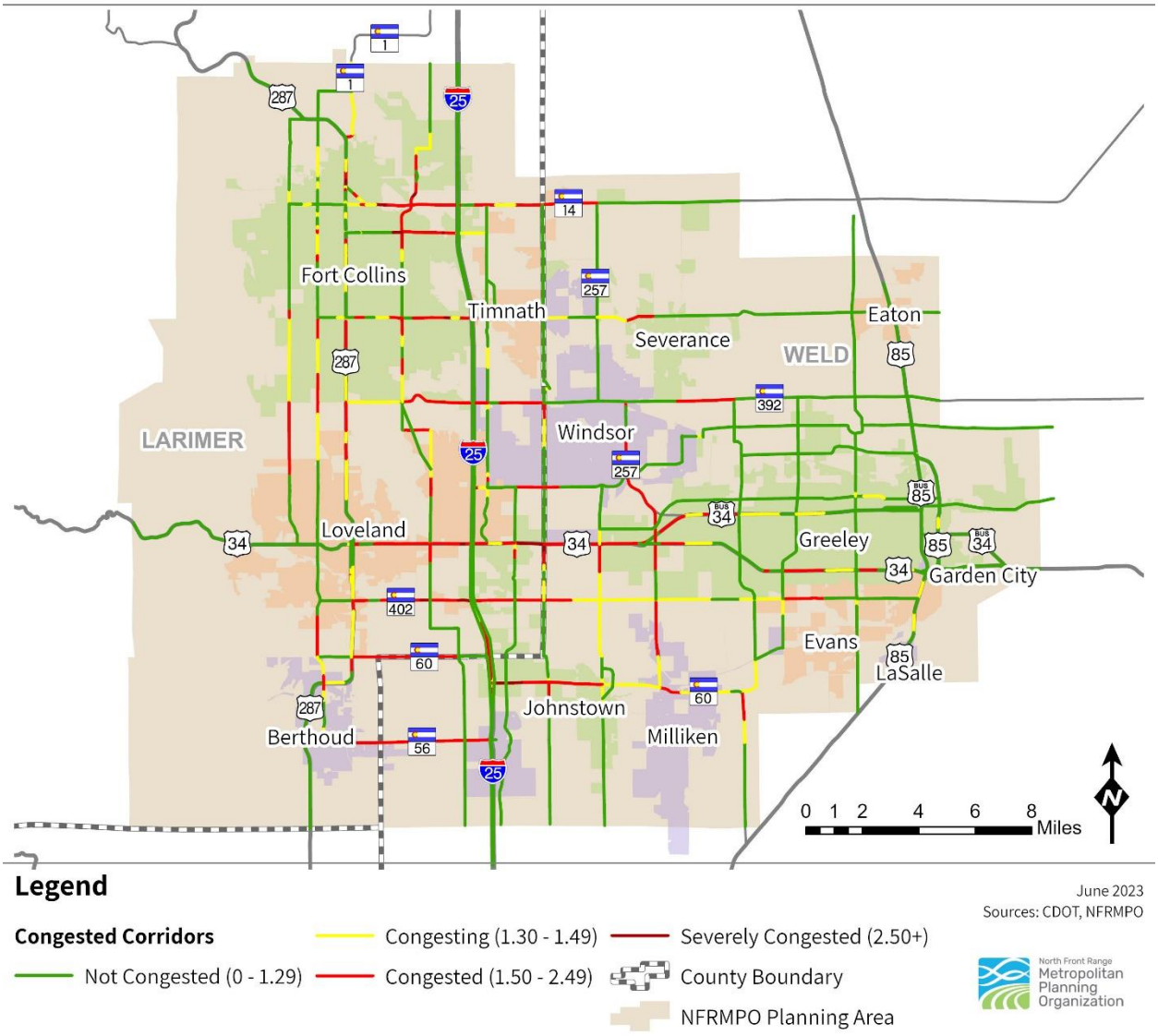


Figure 3-15: Unconstrained Scenario Travel Time Index (TTI) by RSC, 2050

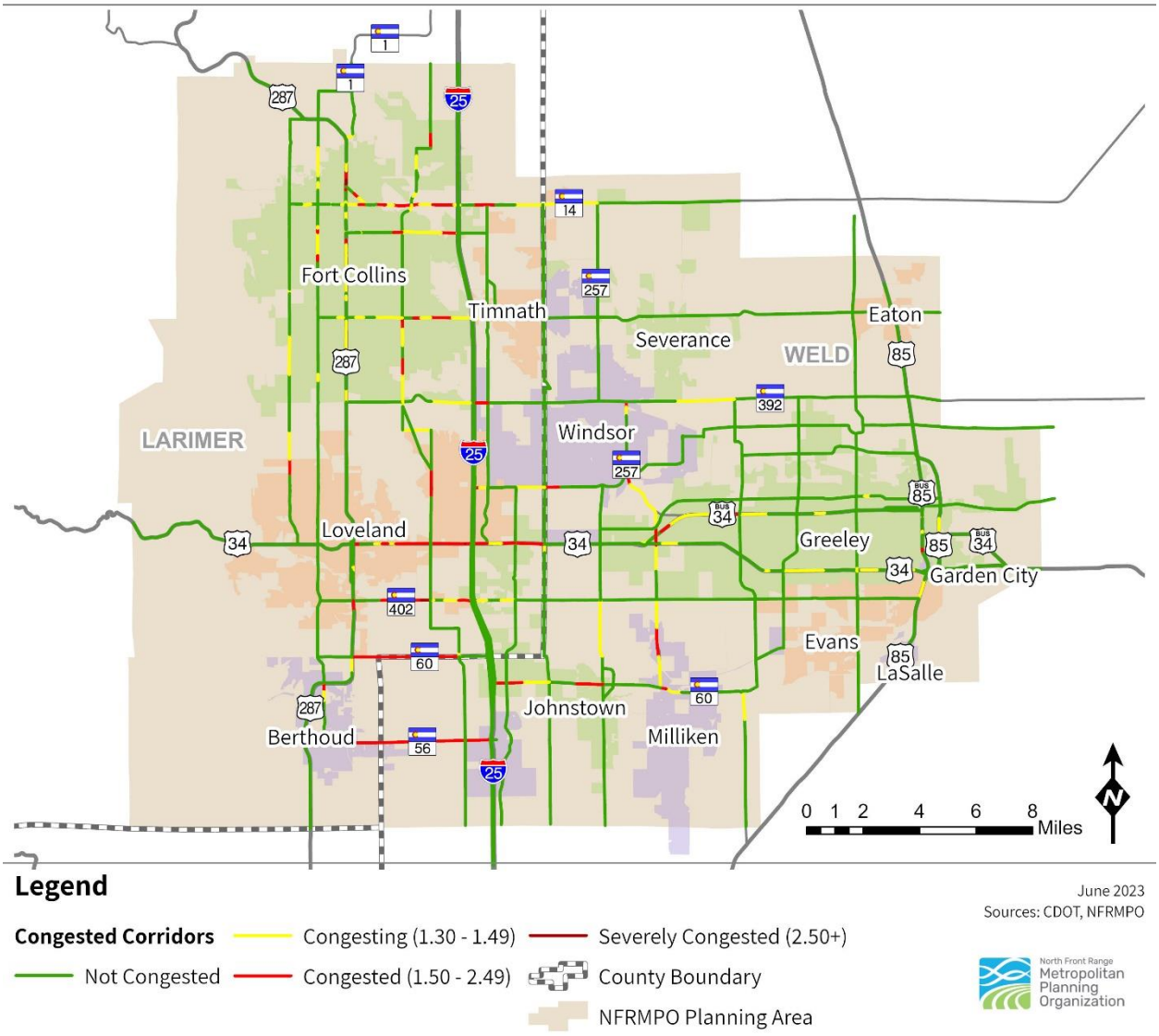


Figure 3-16: High Density Constrained Project Scenario Travel Time Index (TTI), 2050