



Chapter 5. Range of Alternatives

This chapter provides a summary of the process used to develop various street and highway improvements needed to improve the overall street and highway transportation system and address identified existing, 2030, and 2045 street and highway goals, objectives, standards, performance measures and targets, and issues for the Grand Forks-East Grand Forks (GF/EGF) Metropolitan Planning Organization (MPO) area. The Range of Alternatives process is intended to develop a comprehensive list of potential projects for consideration in various financially constrained alternative scenarios. The process for developing the range of alternatives included reviewing existing transportation improvement programs and recent studies to document expected and anticipated improvements. Previously unidentified improvements were considered to address unmet needs based on the results of the technical analysis and traffic modeling from the overall Street/Highway Plan Update process. Public input and partner agency feedback also contributed to the development of the list of projects for evaluation.

2040 Street/Highway Plan Improvements

Projects identified by the previous 2040 Street/Highway Plan Update were compiled to summarize known and documented transportation improvement needs. Previously completed projects since adoption of the 2040 Street/Highway Plan Updated were removed from the inventory.

Programmed Improvements

Programmed roadway improvements as identified by local, regional, and state agencies were inventoried for the GF/EGF MPO area. All roadway projects currently listed in the GF/EGF MPO's transportation improvement program (TIP) and the North Dakota and Minnesota statewide transportation improvement programs (STIP)s were compiled to the range of alternatives list. This information also provided valuable data on project scopes, cost, funding sources and program year.

The Grand Forks 6-year capital improvement program (CIP) and the East Grand Forks 5-year CIP were also reviewed to add locally programmed roadway projects to the list. It was through this process that costs, scopes, funding sources and year of improvements for many local projects were identified and/or refined.

In addition, the recently adopted Grand Forks Infrastructure Sales Tax project list was reviewed. Any projects not previously identified were added to the list. The following list identifies the source of all programmed roadway improvements that were included in the Range of Alternatives:

- NDDOT Statewide Transportation Improvement Program 2018-2021 and 2019-2022
- MnDOT Statewide Transportation Improvement Program 2018-2021 and 2019-2022
- Grand Forks-East Grand Forks MPO Transportation Improvement Program 2018-2021 and 2019-2022
- Grand Forks Capital Improvement Program (2018-2023)
- East Grand Forks Capital Improvement Program (2018-2022)
- Grand Forks Infrastructure Sales Tax Project List

Recently Completed Studies

Several recent studies that identified or recommended roadway improvements with the GF/EGF MPO planning area were compiled and reviewed. It was through this step that additional recommended roadway improvements were identified for inclusion on the expanded range of alternatives list. These studies also provided valuable technical analysis and costs estimates for such improvements.



Safety Plans & Operational Analysis

A list of safety issues and needs were identified as part of the Plan's detailed technical analysis. These issues and needs were evaluated during the development of the range of alternatives by the TAC and GF/EGF MPO staff to determine possible project improvements that will address safety needs. A detailed summary of the safety issues are identified in the Existing Conditions Chapter. A variety of safety related projects eligible for Highway Safety Improvement Program (HSIP) federal funding are also included.

- North Dakota Local Road Safety Plan
- Polk County Safety Plan
- MnDOT District 2 Safety Plan

As discussed in the Existing Conditions Chapter, existing intersection Level of Service (LOS) was also conducted at individual intersection locations within the GF/EGF MPO planning area in an effort to identify intersection operational deficiencies and possible project investments to improve these deficiencies. Additionally, as part of the Red River Crossing forecasted 2045 LOS analysis that was done in conjunction with this Street and Highway Plan at select intersections in the immediate vicinity of the crossings. This analysis, which can be found in Appendix C, was considered in the identification of future operational deficiencies and intersection operational improvement projects.

2030/2045 Capacity Analysis

Year 2030/2045 Average Daily Traffic (ADT) forecasts were prepared by the GF/EGF MPO regional travel demand forecast model. As a part of the Street and Highway Plan update, staff from the Advanced Traffic Analysis Center (ATAC) worked in coordination with GF/EGF MPO staff to update the travel demand model.

The travel demand model update included the most recent state-of-practice techniques to improve the model's ability to correctly replicate local travel patterns. Details about specific updates to the model can be found in Appendix D. Other updates included, but were not limited to, revised 2045 land use and transportation network assumptions to represent a 2015 base year 2030 and year 2045 conditions.

Average Daily Traffic (ADT) forecasts for year 2030 and 2045 were developed after the incorporation of the "Existing + Committed" transportation system which included the existing roadway network plus all roadway improvement projects that currently programmed in the GF/EGF MPO's 2018-2022 Transportation Improvement Program (TIP). After the model was calibrated and verified for an acceptable level of accuracy, 2030/2045 traffic forecasts were produced and mapped. Figure 5-1 and Figure 5-3 illustrate the resulting forecasted 2030 and 2045 ADTs respectively.

2030/2045 ADT forecasts developed through the travel demand modeling process provided the basis for the future Level of Service (LOS) deficiency analysis. This analysis was completed using volume to capacity (V/C) ratios to estimate future levels of congestion. Figure 5-1 illustrates the V/C thresholds used for the LOS deficiency analysis.

The purpose of the LOS analysis was to identify future 2030/2045 congestion for various roadway corridors throughout the GF/EGF MPO planning area, so that mobility improvement projects could be scoped and considered that could mitigate future operational issues. Locations anticipated to exhibit congestion issues (i.e., LOS D or worse) by year 2030 or 2045 were identified through this process and then discussed with the TAC to assess if existing programmed projects were already identified to address the deficiency or if a new Street and Highway Plan project should be proposed. Figure 5-1 and Figure 5-4 illustrate the resulting LOS for 2030 and 2045 respectively.

As part of the regional modeling task, an analysis of various Red River Crossings extending from 17th Avenue South to Merrifield Road were also analyzed. Appendix C provides a detailed narrative and summary of this analysis and associated recommendations and conclusions.



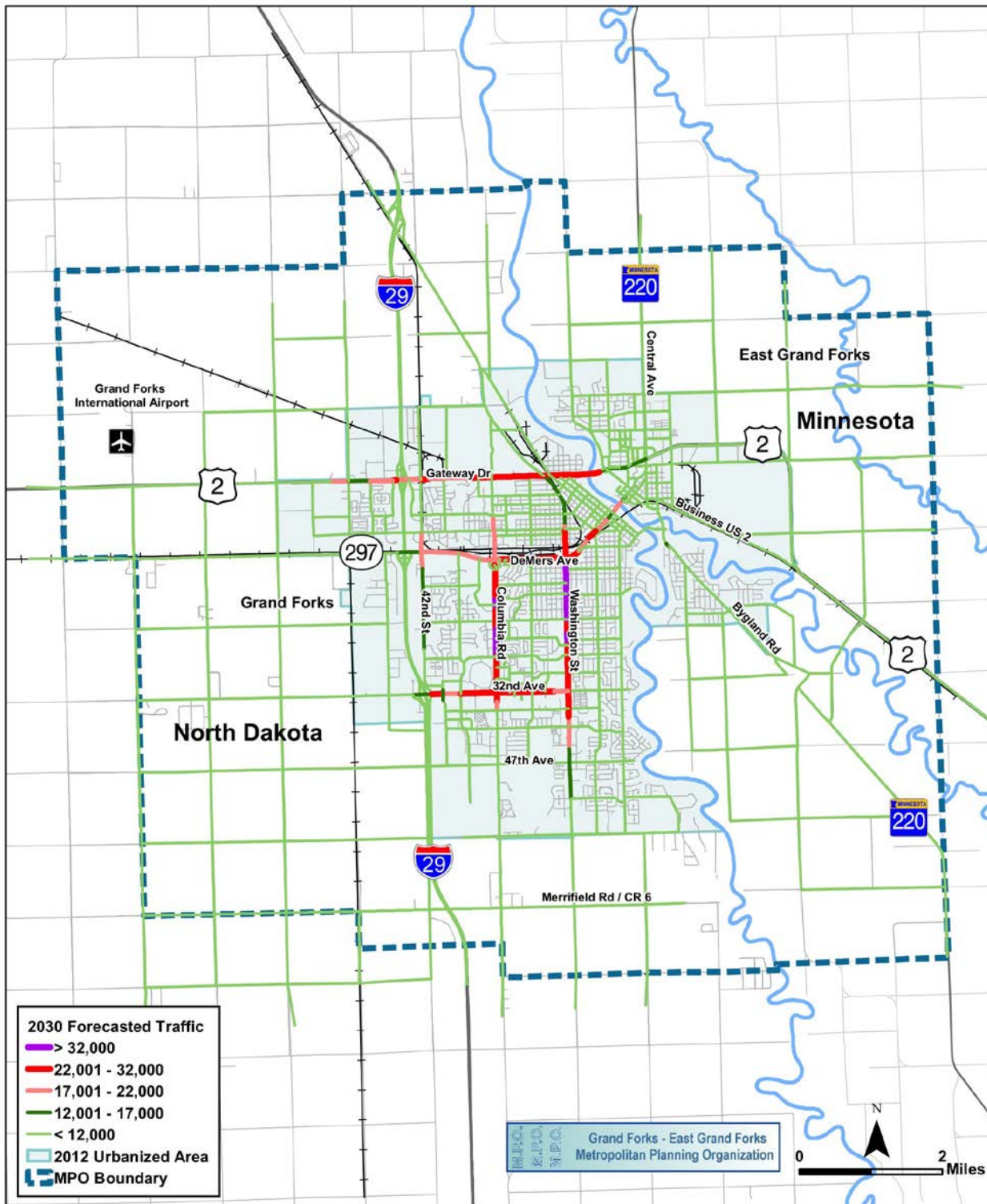
Table 5-1: Volume to Capacity Ratio Thresholds

Level of Service (LOS)	Volume to Capacity (V/C) Ratio
LOS A	< 0.6
LOS B	0.6 - 0.7
LOS C	0.7 - 0.8
LOS D	0.8 - 0.85
LOS D-	0.85 - 0.9
LOS E	0.9 - 1.0
LOS F	> 1.0

Source: ATAC



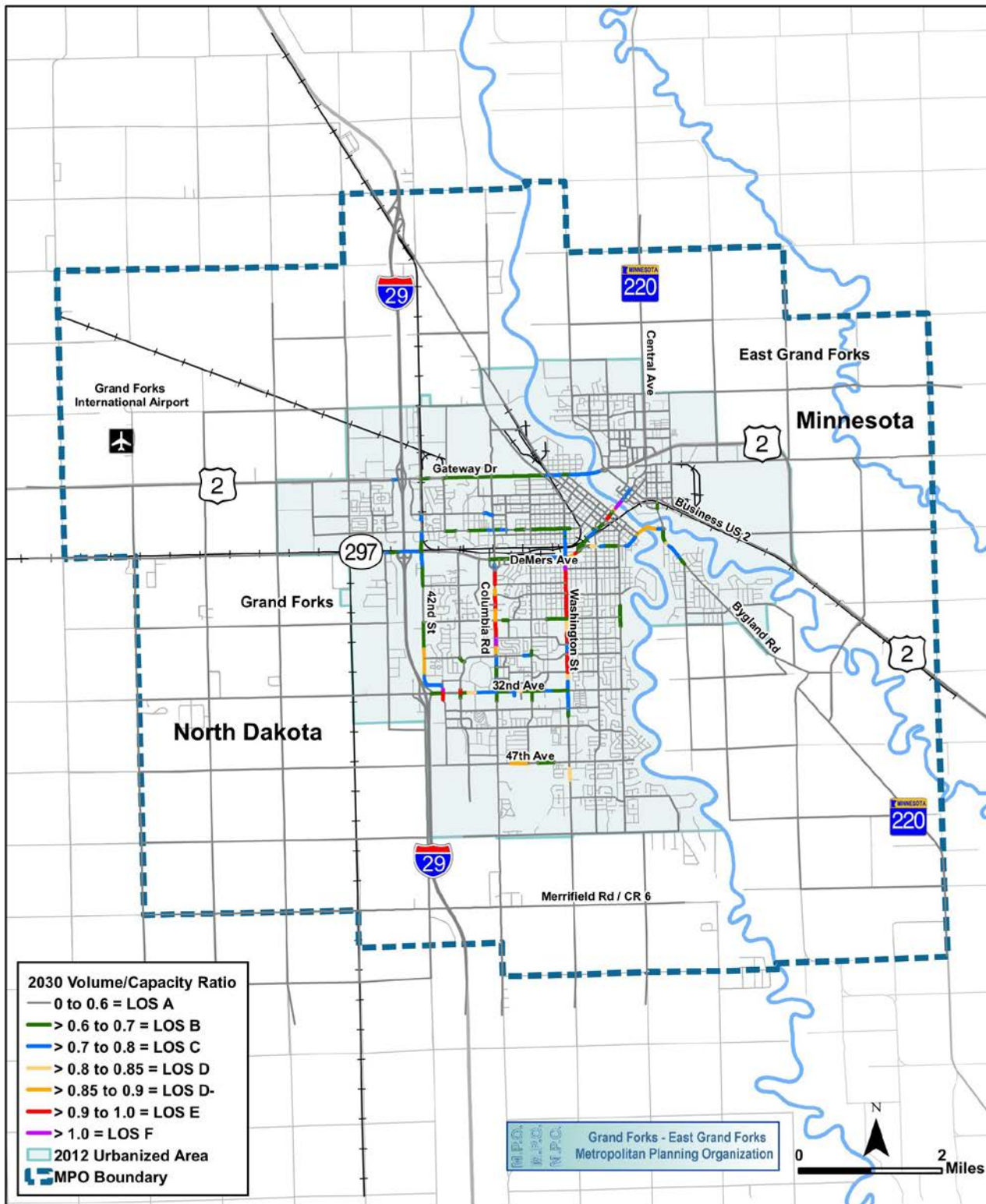
Figure 5-1: 2030 Forecasted Average Daily Traffic Volumes



Source: GF/EGF MPO



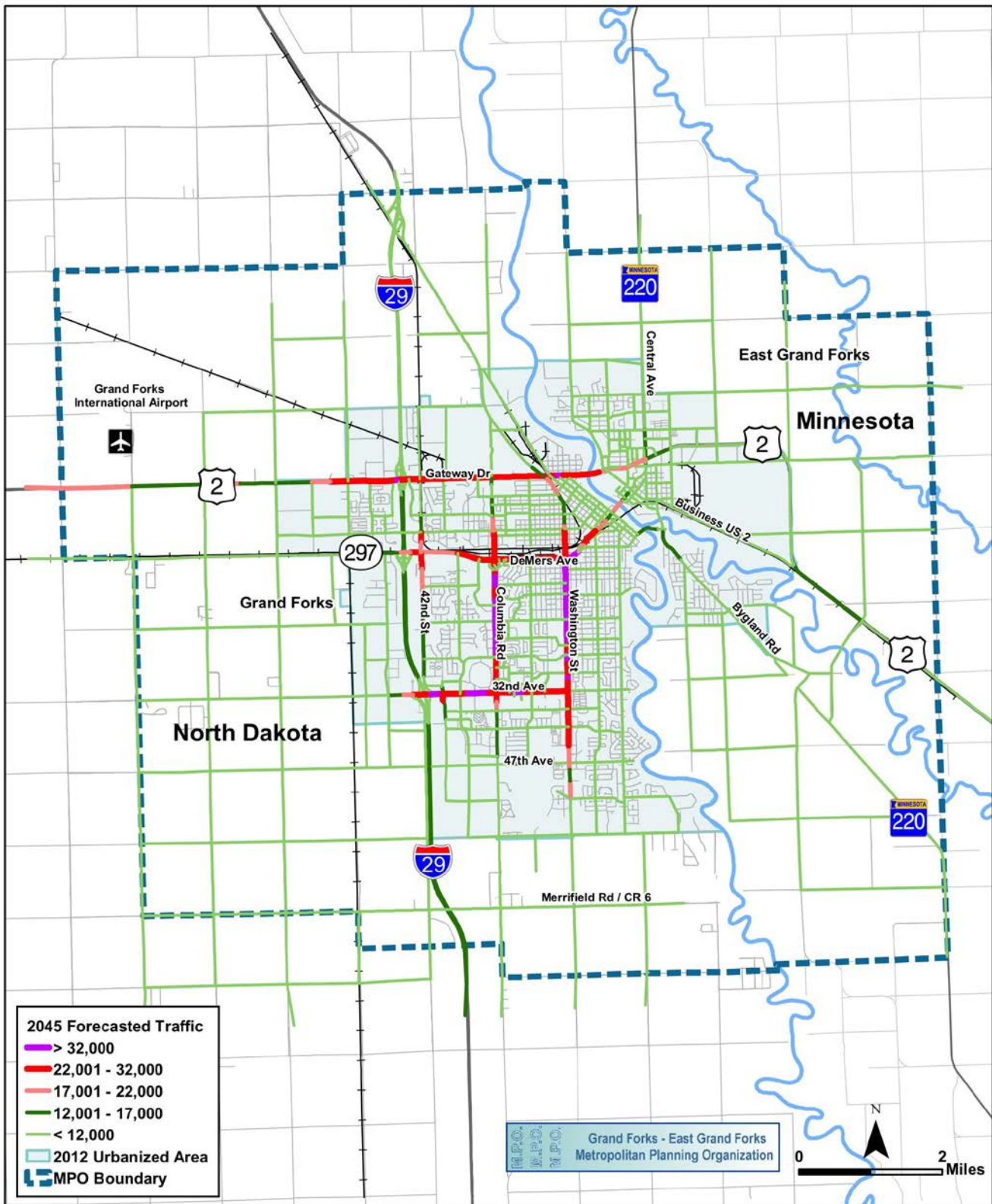
Figure 5-2: 2030 Volume to Capacity Ratios



Source: GF/EGF MPO



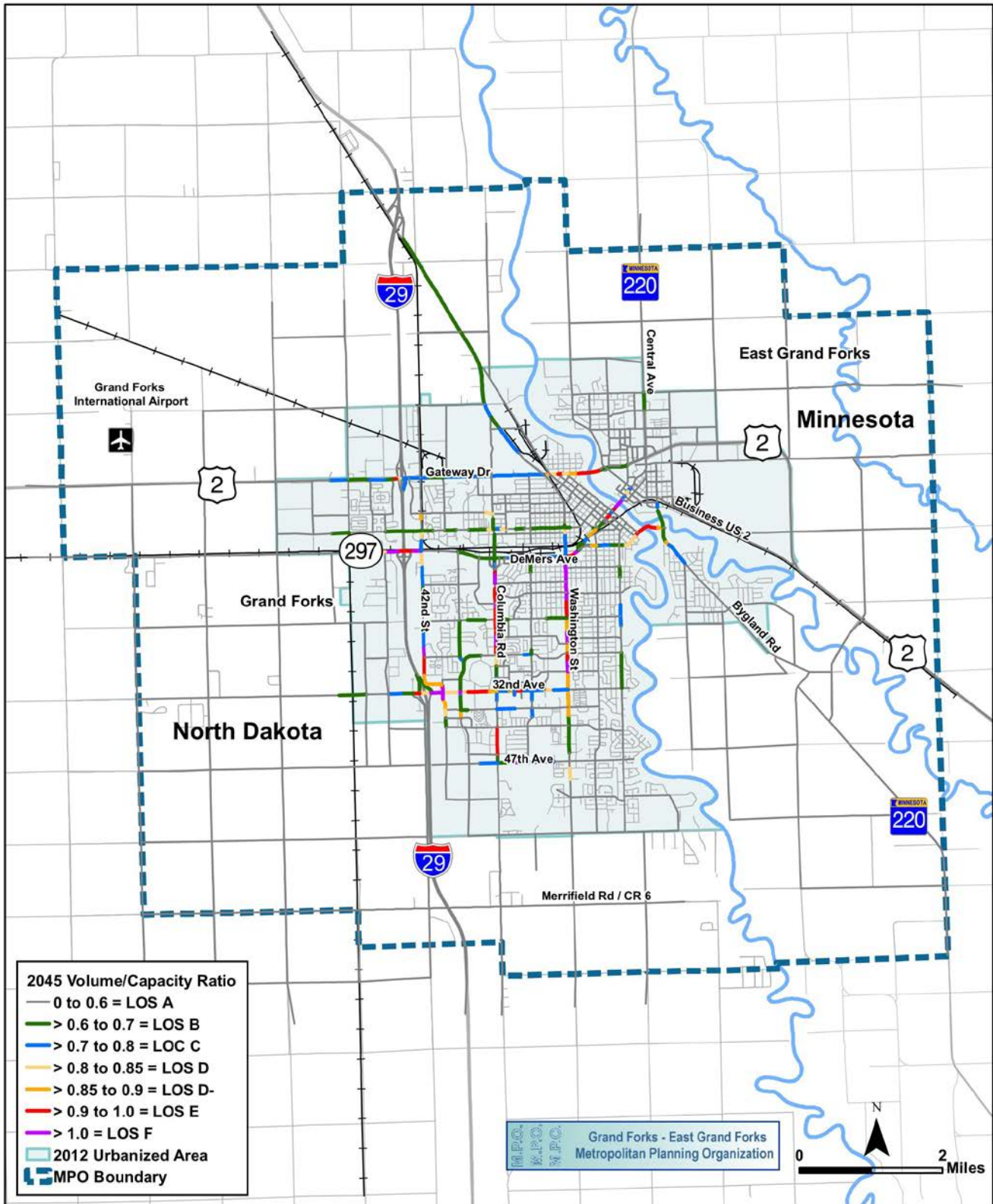
Figure 5-3: 2045 Forecasted Average Daily Traffic Volumes



Source: GF/EGF MPO



Figure 5-4: 2045 Volume to Capacity Ratios



Source: GF/EGF MPO



North Dakota Mainstreet Projects

North Dakota Mainstreet projects were identified within the urban core of the City of Grand Forks. These projects are eligible for a special federal set-a-side established by NDDOT to revitalize existing urban core areas. Projects identified for this program included bicycle/pedestrian improvements, transit improvements, decorative streetlighting, benches, planters, street signs and other streetscape amenities.

State of Good Repair Projects

State of Good Repair (SOGR) projects were identified by NDDOT, MnDOT, the City of Grand Forks, the City of East Grand Forks, Grand Forks County and Polk County based on these agencies assessment of current and anticipated future pavement and bridge conditions.

When considering State of Good Repair projects, efforts were made to group investments within the same roadway corridor that typically would occur in a sequence within the short-range, mid-range and long-range time periods of the transportation plan. These State of Good Repair investments, when done in the right sequence and the right time intervals, have been proven to maximize the useful life of pavements and bridges. These improvements generally include the following:

- Pavement Chip Seal/Bridge Painting
- Pavement Mill and Overlay/Resurfacing/Bridge Redecking
- Major Pavement/Bridge Rehabilitation
- Full Roadway/Bridge Reconstruction/Replacement

Range of Alternatives Project List

The range of alternatives project list represents the entire “universe of projects” that have been evaluated and screened through the planning process. The range of alternatives was focused on addressing the GF/EGF MPO area’s issues, needs and deficiencies. Appendix F and Appendix G provide a detailed summary of each project included in the entire range of alternatives projects list. This list divides projects into six categories, which include:

- MPO 2019-2022 TIP: Included in current regional TIP. Each of these projects is included as part of this metropolitan transportation plan.
- Existing + Committed (E + C) Network: Projects expected to be completed using Non-Federal/Non-State funds.
- Safety/Operations - HSIP: Projects that will improve the safety and operation of the existing system.
- Multimodal, Streetscape, Studies: Projects emphasizing multimodal or streetscape improvements or studies.
- State of Good Repair: Projects related to maintenance and preservation of the existing system.
- Discretionary: All remaining projects not listed previously.