NOVEMBER 30, 2018

TECHNICAL MEMO #3 (PURPOSE & NEED)

Mn 220 N Corridor Study

Prepared for: Grand Forks - East Grand Forks Metropolitan Planning Organization

ALLIANT

1. Introduction

This memo is the third in a series of technical memos for the Mn 220 N (Mn 220) Corridor Study project.

2. Existing and Future Conditions

Refer to Technical Memorandum 1 for documentation of the existing and future conditions assessment.

3. Roadway Safety and Traffic Operation Analysis

Refer to Technical Memorandum 2 for documentation of the roadway safety and traffic operation characteristics.

4. Purpose and Need

According to 23 CFR 450 Appendix A, the transportation planning process is the primary source of a project purpose and need. A vision for the transportation system and goals for achieving that vision are typically developed through the planning process and can be used to develop a purpose and need for a project that frames the scope of the problem to be addressed. The purpose and need statement identified within this study can be carried into or refined for future NEPA documentation during project development (if applicable).

4.1 Project Purpose

Although Mn 220N (Mn 220) services a regional transportation need, most of the study corridor traverses through commercial center with residential neighborhoods adjoining. However, 23rd Street serves as a dividing line between urban and rural land uses, with agricultural activity currently located in the northern end of the corridor. This agricultural area could serve as an ideal location for urban development, so understanding any planned land use changes or potential land use changes will influence investment within the corridor. The purpose of the Mn 220 Corridor Study is to identify existing and future transportation issues within the study corridor and develop project alternatives to address them. Transportation issues may include capacity deficiencies, current or future transportation demands, social or economic demands, model interrelationships, safety and roadway deficiencies.

4.2 Project Need

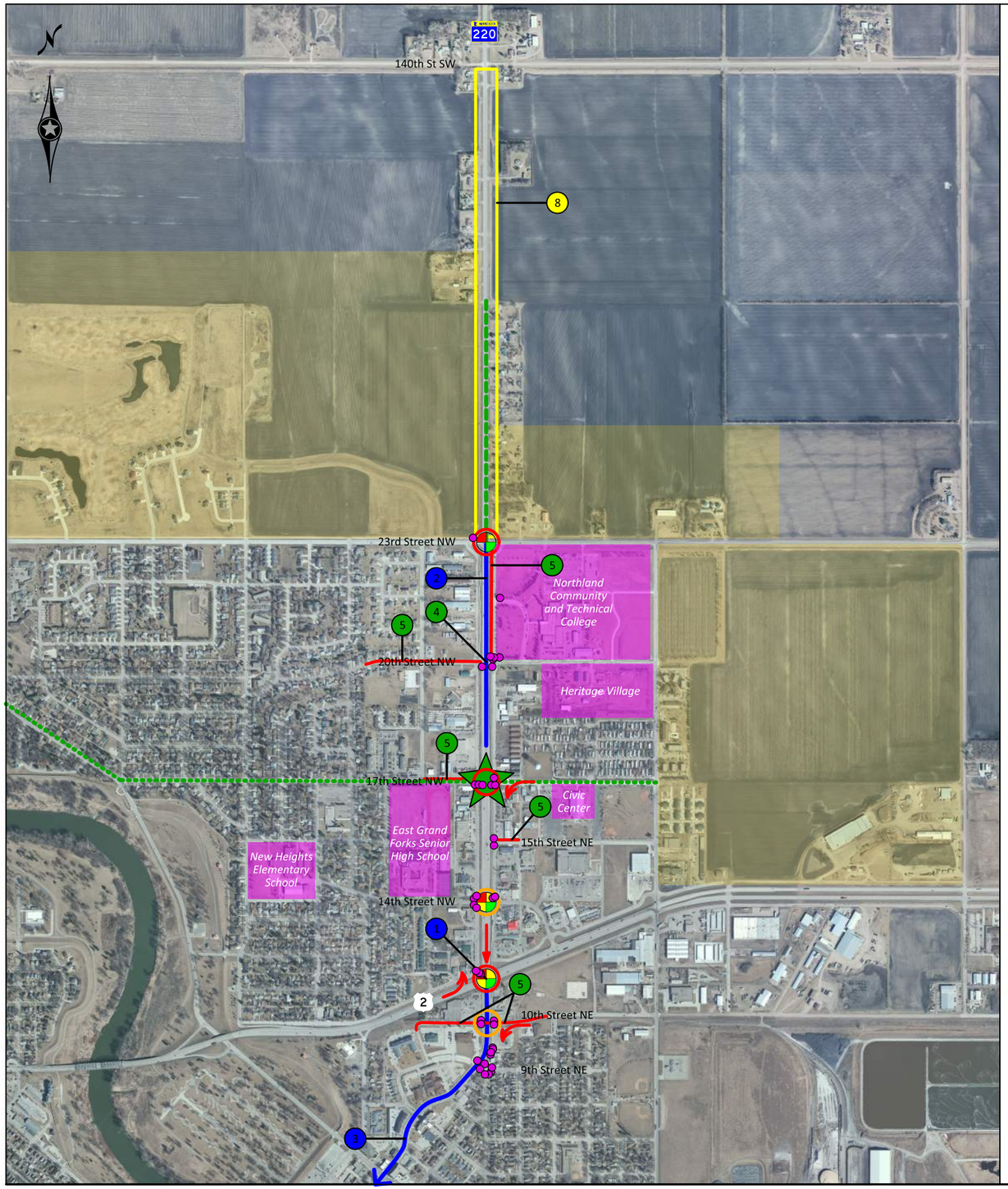
The analysis of existing and future conditions throughout the Mn 220 study corridor has identified numerous needs/deficiencies that either currently exist or are expected to develop based on future traffic projections. **Table 4-1** summarizes the key deficiencies and needs identified throughout the study corridor with respect to the Federal Highway Administration (FHWA) NEPA transportation decision making process. **Figure 4-1** graphically illustrates the corridor needs.

Table 4-1. Mn 220 Corridor Needs

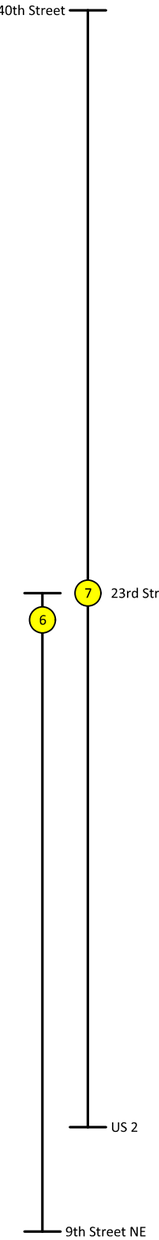
FHWA Purpose and Need Guidelines	Functional Area	Specific Needs Within Functional Area
Capacity	Mn 220 at 10th Street NE	**o** During the p.m. peak hour, the westbound stopped approach is expected to operate at a LOS D by year 2030 and a LOS E by year 2045
	US 2 at Mn 220	**o** The US 2 at Mn 220 intersection is expected to degrade to LOS D during both the a.m. and p.m. peak hours by year 2045. The eastbound left turn movement and southbound through movement (unbalanced lane utilization resulting from the downstream lane drop) are expected to contribute to much of this delay
	US 2 at 17th Street	**o** The westbound stopped approach is expected to operate at a LOS D by year 2030 and a LOS E (a.m. peak hour) and LOS F (p.m. peak hour) by year 2045
Transportation Demand	US 2 at Mn 220	**o** A previously identified project has been included in the Grand Forks-East Grand Forks 2045 MTP to provide right turn/merge geometric modifications and signal timing improvements
	Mn 220 - 17th Street to 23rd Street	**o** The 2045 MTP identifies an illustrative project to extend the 4-lane to 2-lane transition to 23rd Street, add a multiuse trail for 1/2 mile north of 23rd Street, and to install a traffic signal system at 23rd Street
	DeMers Avenue - US 2 to Kennedy Bridge	**o** The 2045 MTP identifies an illustrative project to reconstruct DeMers Avenue. DeMers is a potential turnback corridor on the National Highway System and has been identified by Greater MN Mobility as a mobility need
Social or Economic Demand	Corridor Wide	**o** Significant growth is anticipated in the northern and northeastern areas of East Grand Forks. Improving the quality of access to Mn 220, improving mobility and improving safety at key intersections is expected to benefit area businesses and provide for redevelopment and economic growth.
Modal Interrelationships	Corridor Wide	**o** There are 36 pedestrian ramps (55%) that are not compliant with current ADA design standards.
	Mn 220 - 17th Street to 23rd Street	o The motor vehicle speeds and crossing distance results in an uncomfortable experience and difficulty for pedestrians and bicyclists
	Mn 220 at 20th Street	**o** There is a gap in the sidewalk system between Mn 220 and 5th Avenue NW, which limits the pedestrian neighborhood connectivity to Mn 220 corridor o There is no sidewalk between 20th Street NE and 23rd Street NE on the east side of Mn 220. Pedestrians must cross Mn 220 to continue north/south connectivity.
	Mn 220 at 17th Street	**o** There is a gap in the sidewalk system between Mn 220 and 5th Avenue NW, which limits the pedestrian neighborhood connectivity to Mn 220 corridor. o This intersection is a preferred crossing point for access to the area schools west of Mn 220. o A future bicycle route is planned for 17th Street NW/NE and will cross Mn 220
	Mn 220 at 15th Street	**o** There is a gap in the sidewalk system between Mn 220 and 2nd Avenue NE, which limits the pedestrian neighborhood connectivity to Mn 220 corridor
	DeMers Avenue at 10th Street NE	**o** There are no sidewalks along 10th Street NE on either side of DeMers Avenue, which limits the pedestrian neighborhood connectivity to Mn 220 corridor

Table 4-1. Mn 220 Corridor Needs Continued

FHWA Purpose and Need Guidelines	Functional Area	Specific Needs Within Functional Area
Safety	US 2 at 10th Street NE	**o** There have been 7 crashes over the past 5 year study period. Four of these crashes were right angle or left turn related (57%). The crash rate (0.34) e**xceeds the state average (0.18) and severity rate (0.34) exceeds the state average (0.26)**. 75% of the right angles involved eastbound motorists failing to yield and colliding with westbound 10th Street motorists. 1 crash involved a southbound sideswipe at the lane drop.
	US 2 at Mn 220	**o** There have been 49 crashes during the past 5 year time period (2011-2015). Of these, 17 (35%) were right-angle or involved left-turns. 26 of the 49 crashes (53%) were rear-end crashes. Overall, the crash rate (1.27), severity rate (1.90) and K/A rate (2.6) **exceed the critical crash rate (0.83), critical severity rate (0.90) and statewide K/A average rate (0.42)**. Key observations: - 90% of the left turn crashes involved eastbound/westbound motorists - 50% of the right angle crashes involved southbound motorists failing to yield - 15% of the rear end crashes involved right turn motorists on the channelized islands. **o** Contributing intersection design issues include: - Intersection skew - Cross product of left turning motorists versus opposing through vehicles - lateral left turn lane alignment - high speed channelized right turn movements resulting in poor visibility - Signal timing and signal head placement
	US 2 at 14th Street	**o** There have been 18 crashes during the five year study period. Of these, the predominate crash types included 6 (33%) right-angle/left-turns and 6 rear end (33%). The crash rate (0.70) **exceeds the state average**. 50% of the right angle crashes involved eastbound motorists failing to yield.
	US 2 at 17th Street	**o** There have been 13 crashes during the 2011-2015 time period. Of these, 6 (46%) were right-angle or involved left-turns. Overall, the crash rate (0.71) and severity rate (0.81) **exceeds the critical crash rate (0.46) and critical severity rate (0.44)**. Key observations: - 66% of the right angle crashes involved eastbound motorists failing to yield - Two sideswipe (15% of total crashes) involved eastbound right turn motorists
	US 2 at 23rd Street	**o** There have been 6 crashes during the 2011-2015 study period. Of these, 5 (83%) were right-angle or involved left-turns. The crash rate (0.54) **exceeds the state average (0.18) and severity rate (0.80) exceeds the critical rate (0.50)** - 60% of the right angle/left turn crashes involved a westbound motorist failing to yield the right of way and turning into a southbound motorist. - 40% of the right angle/left turn crashes involved a southbound left turn motorist failing to yield the right of way to a northbound through vehicle.
Roadway Deficiencies	Mn 220 - 23rd Street NW to 140th Street SW	**o** Long term changes in land use north of 23rd Street NW and east of Mn 220 are anticipated to result in increased traffic demand along the Mn 220 corridor. The rural 2-lane segment of Mn 220 north of 23rd Street is expected to operate a LOS C. To maintain optimal mobility and safety of a two-lane rural design it is likely to warrant the addition of turn lanes at key locations.
	Mn 220 - US 2 to 140th St SW	**o** MnDOT evaluation of the Mn 220 corridor pavement conditions indicates a Ride Quality Index (RQI) of 2.8, which is given a "fair" rating. MnDOT has completed a full capital project assessment and found that over next 50 years this segment of highway will require a concrete rehabilitation in 2033 and concrete reconstruction in 2058.
	US 2 at Mn 220	**o** The traffic signal system is approximately 15 years old and can be expected to reach the end of their useful life by year 2030.
	Mn 220 at 14th Street	**o** The traffic signal system is approximately 15 years old and can be expected to reach the end of their useful life by year 2030.
	Mn 220 - 9th Street NE to 23rd Street	**o** Current spacing of public street full access intersections do not meet MnDOT access spacing guidelines for Category 5B roadway.
	Mn 220 - 23rd Street to 140th Street SW	**o** Direct private residential access to Mn 220. Future redevelopment of adjacent agricultural land will require access management guidance.



ROADWAY DEFICIENCIES



LEGEND

CAPACITY
- Movement Expected to Reach Unacceptable LOS by 2045

TRANSPORTATION DEMAND
- Potential Future Signal
- Illustrative Reconstruction Project (2045 MTP)

SOCIAL OR ECONOMIC DEMAND
- Key Land Use
- Significant Growth Area (Expected to Impact Corridor)

MODAL INTERRELATIONSHIPS
- Gaps in Sidewalk Connectivity
- Ped Ramp Doesn't Meet Current Standards
- Future Bike Route (Crossing Mn 220)
- Future Multiuse Trail (Along Mn 220)
- Preferred Crossing Point for Area Schools (currently uncomfortable crossing for bikes and peds)

ROADWAY DEFICIENCIES
- Signal System Expected to Reach End of Useful Life by 2030

SAFETY
- Crash Issue (Exceeds Statewide Average)
- Crash Issue (Exceeds Critical Rate)

Notes:

1. Previously identified project to provide right turn/merge modifications and signal timing improvements *(2045 MTP).*
2. Illustrative project to extend 4-lane to 2-lane transition to 23rd Street *(2045 MTP)*
3. Illustrative project to reconstruct DeMers Avenue *(2045 MTP). DeMers Avenue is on National Highway System. Greater Minnesota mobility has identified potential mobility concerns.*
4. Pedestrians must cross roadway to continue north/south connectivity
5. Gap in sidewalk network and accessibility.
6. Current spacing of intersections betwen 9th Street and 23rd Street do not meet MnDOT access spacing guidelines.
7. MnDOT project assessment indicates that this segment will require concrete rehabilitation in 2033 and reconstruction in 2058.
8. Increased traffic demand north of 23rd Street likely to warrant turn lanes at key locations between 23rd Street and 140th Street. Additionally, future redevelopment of adjacent agricultural land will require access management guidance.

ALLIANT ENGINEERING

Figure 4-1
Corridor Deficiencies and Transportation System Needs