

USTH 12

Draft Purpose and Need

County Line Road to Hennepin CSAH 90

Independence, MN

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Introduction

Based on recent crash history on US Trunk Highway (USTH) 12 within the City of Independence it was prudent to examine existing safety conditions to determine whether roadway improvements could reduce crashes. To begin this process, a review of the roadway was completed to identify traffic problems that define the needs of the corridor. Project needs help to define the purpose of proposed future modifications or improvements. Both evaluation criteria and project alternatives can be developed based on the project's identified needs to ensure that the selected alternative meet the purpose of the project.

To understand the need for this proposed project, a Transportation Analysis Report (**see Appendix 1**) and an Environmental Scan (**see Appendix 2**) were completed. The Transportation Analysis Report provides an in-depth analysis of existing and future roadway conditions, corridor mobility, and crash performance. The Environmental Scan identifies environmental conditions and potential challenges along the corridor. In addition to the information compiled in these reports, the feedback provided by MnDOT Metro District and District 3 (D3) functional groups and other stakeholders assisted in developing the preliminary Purpose and Need Statement to be carried forward in the USTH 12 Corridor Study.

Background

Corridor Information

USTH 12 is a high-volume, two-lane, 55 mph Principal Arterial. USTH 12 is part of the National Highway System (NHS) and is an Over Size Over Weight (OSOW) Super Load Corridor within the project limits. Of the USTH 12 corridor, the portion that makes up the project area is a 4.5-mile segment between the County Line Road and Hennepin County State Aid Highway (CSAH) 90 intersections (See Figure 1, project area). The surrounding environment can be described as rural, with land uses being mainly agricultural, with dispersed residential and commercial uses. The City of Delano is located on the western edge of the project area and City of Maple Plain is located on the eastern edge of the project area.

The current USTH 12 alignment was originally constructed in 1937, with shoulder widening and left-turn bypass construction occurring in 1978. All intersections are currently side-stop controlled, with the exception of signal control at the County Line Road intersection. In 2021, a roundabout will be constructed at the CSAH 90 intersection and the CSAH 92 intersections will be combined into an overpass with a roundabout connection to USTH 12. There is a significant number of private accesses on USTH 12, the majority of which do not have reasonable alternative access.

Figure 1 – Hwy 12 project area highlighted



Need for Project

The need identified for this project was evaluated through the review of existing and future conditions on USTH 12, coordination with MnDOT Metro and D3 functional groups, and discussions with the City of Independence, the Highway 12 Safety Coalition, and other local stakeholders. A summary of the information compiled to develop the primary and secondary need statements and additional considerations taken in account are provided below.

Primary Need

Safety

USTH 12 has demonstrated deficient vehicular safety performance based on the occurrence of crashes between the County Line Road and CSAH 90 intersections. Crash occurrence within the project area, specifically fatal and serious injury crashes, is significantly above expected for this type of roadway.

This crash history has resulted in a high level of local involvement on the Corridor, as well as elevated public knowledge of the Corridor in the Minneapolis/St. Paul Metropolitan Area. The Highway 12 Safety Coalition formed in 2014 in response to concerns about fatal crashes on USTH 12. Since 2014, multiple safety projects have been completed on USTH 12 both within and outside the project area. However, some segments of USTH 12 continue to experience elevated crash rates, including severe and fatal crashes.

The 4.5-mile segment between the intersections with County Line Road and Hennepin CSAH 90 experiences the highest frequency of fatal crashes on the USTH 12 Corridor. Multiple safety projects have been completed, but fatal lane departure crashes have continued to occur at an elevated rate. Recently, fatal head-on crashes occurred in both 2018 and 2019. The intersection projects at CSAH 90 and CSAH 92 are anticipated to improve intersection safety but are not expected to significantly impact lane departure crashes on the corridor.

MnDOT crash data for the latest 10-year period (2010-2019) shows that there were **six fatal crashes**, six serious injury crashes, 33 minor injury crashes, 37 possible injury crashes, and 171 property damage only crashes within the project area (**See Appendix 3**). Of the six fatal crashes, one crash was an intersection related rear-end crash, one was a single vehicle run-off-road crash, and four were head-on crashes.

The crash rate (CR) for the segment in the project area over the 10-year analysis period was 0.93 crashes per million vehicle miletravelled (MVMT). The critical crash rate for similar two-lane corridors is 0.89 crashes per MVMT. An observed crash rate above the critical rate demonstrates that the observed crash rate is greater than expected for similar facilities with statistical significance.

The Fatal and A (serious injury) Rate (FAR) in the project area over the 10-year analysis period was 4.42 crashes per 100 MVMT (or entering vehicles for intersections). The critical FAR for similar two-lane corridors is 3.26 crashes per 100 MVMT. An observed FAR above the critical FAR demonstrates that the observed FAR is greater than expected for similar facilities with statistical significance.

Crash Costs on the corridor total **\$90,932,000** for the ten-year period from 2010-2019. Crashes, crash costs, CR, FAR, and critical rates are compiled in **Table 1** below. An in-depth crash analysis for existing and expected future crash performance is included in the Transportation Analysis Report in Appendix 1.

Table 1 – 2010-2019 Crash Summary. Compares types of crashes, crash costs, severity, and area of occurrence.

Crashes	#	Crash Costs	Relation to Roadway	CR	Critical CR	FAR	Critical FAR
Fatal	6	\$73,800,000	Non - Intersection	0.39	0.43	2.95	2.00
Serious Injury	6	\$4,080,000					
Minor Injury	33	\$6,930,000	Intersection	0.03 - 0.70	0.43 - 0.67	0.00 – 1.46	2.21 - 3.74
Possible Injury	37	\$4,070,000					
PDO	171	\$2,052,000	All Crashes in project area	0.93	0.89	4.42	3.26
Total	253	\$90,932,000					

Source: MnDOT Crash Data and KLJ data analysis

Secondary Need

Mobility

USTH 12 experiences operational delay during peak periods within the project area. This delay results in increased costs and travel times for users.

USTH 12 serves both a regional trips and commuters and experiences Average Annual Daily Traffic (AADT) volumes of 14,300 to 17,200. The planning level capacity of a two-lane highway with turn lanes is approximately 18,000 AADT. Residential and commercial development in the cities of Independence and Delano, along with cities farther west on USTH 12, have resulted in a 20-year annual growth rate of 0.8% within the project area. Analysis of the Twin Cities regional travel demand model indicates that similar increases in traffic volumes are expected to occur in the next 20-year period. Traffic projections developed using the Twin Cities regional travel demand model show that AADT is expected to range from 15,400 to 19,100 by 2040, which exceeds the planning level capacity.

Traffic volumes within the project area reflect the commuter use and are heavily directional by time of day. Slightly more than 70% percent of traffic is travelling eastbound in the morning and travelling westbound in the afternoon. This heavy peak use results in increased travel times for eastbound in the morning and westbound in the afternoon. The increased travel times result in large annual user delay costs. Based on overall system delay, users incurred

\$1.45 million in annual delay cost under existing conditions. In 2040, users are anticipated to incur up to \$1.91 million in annual delay cost.

Travel times, average delay, and user costs for free flow conditions, existing conditions, and future conditions are provided in **Table 2**. To encompass the intersections at each end of the project area, conditions were calculated based on the segment of USTH 12 between 13th Street in Delano and the railroad overpass crossing USTH 12 in Maple Plain. Additional travel time, delay, and user costs are incurred eastbound in the AM peak and westbound in the PM peak, and so those periods are represented. An in-depth analysis of existing and expected future conditions is included in the Transportation Analysis Report in Appendix 1.

Table 2 – Comparison of existing and future conditions as it relates to travel time.

Existing and Future Mobility				
Condition Analyzed	Time Period / Direction	Travel Time Through Project Area	Average Delay within Project Area	User Delay Costs (Annual)
Existing (2019)	Off Peak / Eastbound	5.7 min	N/A	N/A
	Off Peak / Westbound	5.6 min		
	AM / Eastbound	6.1 min	0.4 min	\$1.43 million
	PM / Westbound	6.0 min	0.4 min	
Future (2040)	Off Peak / Eastbound	6.1 min	N/A	N/A
	Off Peak / Westbound	5.9 min		
	AM / Eastbound	6.6 min	0.5 min	\$1.94 million
	PM / Westbound	6.1 min	0.2 min	

Source: KLJ data analysis

Additional Considerations

Pedestrians and Bicyclists

Pedestrian access is limited, both along and across the project area. Currently, the only designated crosswalk is at the signalized County Line Road intersection at the far western end of the project area. The CSAH 90 roundabout and CSAH 92 overpass with roundabout projects programmed for 2021 will provide pedestrian safety improvements for North-South trips crossing USTH 12.

The Minnesota Statewide Bicycle Plan identifies USTH 12 in the project area as a Low Priority Corridor. The designation indicates that the corridor was not prioritized by the public during plan development but does represent an envisioned connection throughout the state. Low Priority Corridors are unlikely to be designated as part of the State Bicycle Route Network.

Total pedestrian and bicycle activity within the project area is expected to be low based on use of similar facilities. Public engagement conducted for recent projects within the project area has supported that expectation. However, the USTH 12 corridor is one of few East-West routes through the City of Independence and serves as the only access to a number of residential properties. A recent Severe Injury bicycle/vehicle crash that occurred at the CSAH 90 intersection highlights that some use does occur. Pedestrian and bicycle access along the corridor will need to be considered to ensure reasonable accommodations are maintained, and any pedestrian facilities will need to meet Americans with Disabilities Act (ADA) requirements.

Pavement Preservation

While the current alignment is dated, the pavement conditions are acceptable. The metrics used for pavement condition are Ride Quality Index, Surface Rating Quality, Pavement Quality Index, and Remaining Service Life. The Remaining Service Life is currently rated as fair, with all other metrics rated as good.

Because of the acceptable pavement conditions, no major pavement project is planned for this segment of USTH 12. The Capitol Highway Improvement Program (CHIP) identifies a medium mill and overlay project planned for 2028.

Environmental Constraints

Potential Social, Economic and Environmental (SEE) constraints within the project area that were identified in the Environmental Scan include:

- Land use: residential, commercial, church, BNSF railroad paralleling the USTH12,
- Wetlands
- 100-year Floodplain
- Historical/Architectural sites
- Section 4(f) properties: grant-in-aid snowmobile trail, Robina Lake WMA, historic sites

A more comprehensive summary of potential SEE constraints in the corridor is included in the Environmental Scan in Appendix 2.

Conditions outside the project area

The USTH 12 Corridor has existing and potential volume constraints outside of the project area. To the west, USTH 12 in the City of Delano is a two-lane highway with multiple signalized intersections. To the east, USTH 12 in the City of Maple Plain is also a two-lane highway with multiple signalized intersections. Further east, in the cities of Long Lake and Orono, USTH 12 is a two-lane grade separated highway with an AADT of 24,500. These areas experience varying levels of congestion and increased travel times during peak periods. Capacity expansion near the project area is not currently planned on USTH 12.

Changes in the existing and future constraints outside the project area could impact the safety and mobility of USTH 12 within the project area. The nearest recent capacity improvement (Super 2) on USTH 12 exposed significant latent user demand in the area. Alternatives analysis should understand both how changes outside the project area could impact the project area and the resiliency of each alternative to additional traffic volume.

It is also important to note that changes outside the project area could result in Mobility changing from a Secondary to a Primary Need. The current study limits encompass an area of TH 12 that experiences less delay and faster travel times than portions of the USTH 12 Corridor immediately to the East and West.

Purpose of Project

Based on the data collected and initial analysis, the primary purpose of the project is to improve vehicular safety on USTH 12 between the intersections with County Line Road and Hennepin CSAH 90, which has a crash rate above the critical crash rate for similar facilities and an ongoing history of fatal and serious-injury crashes. The secondary purpose of the project is to reduce delay and travel times on USTH 12 between the intersections with County Line Road and Hennepin CSAH 90, which currently experiences peak period delay and high user costs.