



I-29 TRAFFIC OPERATIONS

ENVIRONMENTAL CONSTRAINTS ANALYSIS



5. ENVIRONMENTAL CONSTRAINTS

PROJECT PURPOSE AND NEED

The purpose and need for the project have been developed under guidance pursuant to 23 CFR 450 Appendix A (Linking the Transportation Planning and NEPA Processes). Identifying project needs and developing a project purpose at the corridor planning level aids in the development, evaluation, prioritization and elimination of alternatives. The overall project purpose and needs identified during this corridor level planning study will be carried into the NEPA phase of project development (if applicable) and further refined to aid in the selection of a preferred alternative.

PURPOSE OF THE PROJECT

The purpose of the 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.

NEED FOR THE PROJECT

The analysis of existing and future conditions throughout the Grand Forks I-29 project corridor has identified numerous needs/deficiencies that either currently exist or are expected to develop based on future traffic projections. These needs vary by location but carry common themes throughout the project corridor. A summary of these needs is presented in Table 5-1 below.

Table 5-1: I-29 Project Corridor Needs

FHWA Purpose and Need Guidelines	Functional Area	Specific Needs Within Functional Area
Capacity	Gateway Drive/US 2 Interchange	Increasing commercial and industrial demand is expected to cause the interchange functional area to operate deficiently by 2040, with LOS “F” expected at the East Ramp and 43 rd Street intersections. In addition, train events produce significant operational deficiencies along Gateway Drive/US 2. When train events occur on the Glasston Subdivision Line, Gateway Drive/US 2 is completely blocked, creating delays and queues that back up onto the interstate.
	DeMers Avenue/ND 297 Interchange	The interchange functional area is expected to operate deficiently by 2025. Nearly every intersection in the functional area operates deficiently during the A.M. peak by 2040 and travel time through the interchange functional area is nearly four times longer than during free flow conditions.
		Train blockages at 42 nd Street just north of DeMers Avenue/ND 297 create queueing that extends to the interchange and will likely reroute several thousand vehicles onto the interstate by 2040.
32 nd Avenue South/US 81B Interchange	Massive amounts of growth forecasted within one mile of interchange (more than 2,800 new jobs and 725 new households by 2040), starts to overburden interchange as soon as 2025. Deficient operations are expected at the West Ramp, East Ramp and 38 th Street intersections. These delays are anticipated to affect mainline I-29, producing deficient operations at the northbound and southbound off-ramp diverge areas due to queues extending onto mainline I-29. Travel time more than doubles from 2015 to 2040 through this interchange functional area, adding nearly two minutes over free flow travel time.	
Transportation Demand	47 th Avenue South	An interchange at this location was included in the 2040 LRTP’s illustrative project list.
	32 nd Avenue South/US 81B Interchange	Improvements along 32 nd Avenue South/US 81B through the study area include widening to six lanes which was planned for construction between 2031 and 2040. Additionally, realigning 42 nd Street to the East Ramp intersection in this interchange functional area was included in the 2040 LRTP’s illustrative project list.
	17 th Avenue South	The 2035 LRTP included an overpass as a mid-term project; however, this project was moved to the illustrative project list in the 2040 LRTP.
	DeMers Avenue/ND 297 Interchange	No capacity enhancements have been included in previous LRTPs, but the 2040 LRTP did include an illustrative project for traffic control signals at the East Ramp and West Ramp intersections.
	Gateway Drive/US 2 Interchange	Improvements at this intersection were studied during the US 2 Corridor Study but have not been included in any cost constrained list of projects for the 2040 LRTP.
Social or Economic Demand	Corridor Wide	East-west connectivity for all modes of transportation is impeded by current and future forecasted congestion.
		East-west bicycle and pedestrian connectivity is limited to Gateway Drive/ US 2, University Avenue and 32 nd Avenue South/US 81B, leaving a 2.25 mile gap between University Avenue and 32 nd Avenue South/US 81B to cross the interstate.
		No existing dedicated bicycle or pedestrian facilities at the North Washington Street/CR 11/ US 81 interchange functional area, the 47 th Avenue South corridor or the Merrifield Road/ CR 6 corridor. Bicycles can and do use the roadway; shoulders at this location are wide enough to support bicycle activity according to AASHTO.
	32 nd Avenue South/US 81B Interchange	Massive amount of growth forecasted within one mile of interchange (more than 2,800 new jobs and 725 new households by 2040). This growth is expected to overburden existing transportation facilities resulting in deficient traffic operations. This breakdown in traffic operations would have associated social and economic impacts to the traveling public as well as businesses within the study area. Improving

FHWA Purpose and Need Guidelines	Functional Area	Specific Needs Within Functional Area
		overall traffic operations would satisfy these social demands and promote economic development within the surrounding area.
Modal Interrelationships	Gateway Drive/US 2 Interchange & University Avenue Overpass	Limited transit accessibility at the University Avenue overpass and Gateway Drive/US 2 interchange.
Safety	I-29 Mainline between Gateway Drive/ US 2 and DeMers Avenue/ ND 297	This one-mile section of I-29 experienced 28 crashes over five years, with 14 being due to weather or winter roadway conditions. Three occurred when a vehicle tried to merge onto southbound I-29.
	DeMers Avenue/ND 297 and East Ramps Intersection	A total of 14 total crashes over five years at this intersection, of which five were northbound rear-end crashes. Often times, at locations with a yield controlled right-turn, motorists look upstream for gaps in traffic and not forward, and then collide with vehicles ahead.
	DeMers Avenue/ND 297 and 42 nd Street intersection	A total of 28 left-turn crashes at this intersection over five years. Special events at the Alerus Center and train events may result in long queues and delays. As motorists become frustrated, they become more likely to take risks to avoid these long delays.
	32 nd Avenue South/US 81B and West Ramps Intersection	Seven crashes have occurred at this intersection over the past five years when a driver ran a red light. Adjustments to clearance intervals may mitigate this trend.
	32 nd Avenue South/US 81B and 38 th Street Intersection	A total of 42 crashes at 38 th Street have occurred over the past five years, of which 14 were left-turn crashes. Negative offset turn lanes may obstruct views of conflicting traffic. Six additional crashes were caused by drivers running red lights. This intersection also experienced 15 rear-end crashes that may be linked to stop-and-go traffic. Improved operations at this intersection could mitigate these crash trends.
Roadway Deficiencies	North Washington Street/CR 11/US 81 Interchange	Eight access points currently exist in less than 1.25 miles.
	Gateway Drive/US 2 interchange	Four signalized intersections (and one two-way stop controlled intersection) in 0.4 miles.
	DeMers Avenue/ ND 297 interchange	Current Cenex driveway introduces conflicts and mixed speeds.

AFFECTED ENVIRONMENT

To properly assess potential impacts of a project, a baseline of existing environmental conditions was developed. A desktop assessment of the project corridor was completed using a variety of state, federal and local resources. This baseline information was divided into resources categories and the potential for impacts to each resources category was assessed based on the project information known to date. As project alternatives are developed and refined, this assessment of impacts will also become more refined. Please refer to Figure 5-1 for a visual overview of known environmental considerations within or adjacent to the *General Travel Corridor*.

- » **Development of General Travel Corridor.** For the purposes of the environmental screening for the I-29 Traffic Operations Study, a *General Travel Corridor* was defined to assist with the screening of project alternatives. The development of the *General Travel Corridor* defines the general corridor within which smaller scale project alternatives would be developed at the planning level and potentially transitioned into NEPA. The I-29 Traffic Operations Study considers both the I-29 Mainline as well as existing and future intersecting arterials. Therefore, the *General Travel Corridor* includes existing and future roadways outside of I-29 mainline (e.g. 47th Avenue, 17th Avenue, Gateway Drive/US 2, 42nd Street, etc.).

WETLANDS

The United States Fish and Wildlife Service National Wetland Inventory (NWI) Map indicates the potential for presence of wetlands within the project corridor. NWI wetlands are identified in the general area of the Demers Avenue/ND 297 and Gateway Drive/US 2 interchanges. Aerial imagery reveals additional wetland signatures within the interstate right-of-way and the English Coulee bisects I-29 near 17th Avenue South. Once project alternatives have been developed, it is recommended a field wetland delineation be completed and submitted to the US Army Corps of Engineers (USACE) for a jurisdictional determination. A permit from the USACE may be required in the event project activities result in permanent impacts to jurisdictional wetlands.

The majority of the wetlands located along the project corridor appear to be artificially created. Impacts to artificial wetlands do not require mitigation per Executive Order 11990; however, wetland mitigation may still be required in the event the USACE assumes jurisdiction and impacts exceed established thresholds.

FLOODPLAIN

According to the Federal Emergency Management Agency's (FEMA) flood hazard mapping program, the majority of the study area is located within a Zone X flood hazard area. This area is protected from a one-percent-annual-chance or greater flood hazard by a levee system. In addition, there are two areas (Legal Drain 27 and the flood diversion channel south of North Washington Street/CR 11/US 81 interchange) that are designated as a Zone AE flood hazard area. These areas are subject to inundation by the one-percent-annual-chance or greater flood hazard and base flood elevations have been determined. It is recommended that any proposed projects be coordinated with FEMA to ensure compliance with the National Flood Insurance Program.

CULTURAL

A review of the State Historical Society of North Dakota's site records was completed for the study area. This review identified several site leads and unevaluated cultural resources within or adjacent to the study area. Most of these cultural resources were associated with the University of North Dakota campus and its buildings as well as the railroad. It is unlikely that a proposed project would result in an adverse impact to any of these identified cultural resources; however, it is recommended that additional cultural investigations be completed for any future projects.

NOISE

Construction and operation of a transportation facility has the potential to result in noise impacts on noise sensitive receptors in proximity to the proposed action. Noise sensitive receptors within or near the project corridor included

residential housing, schools, parks and medical facilities. Once project alternatives have been developed, it is recommended that a noise analysis be completed to assess existing and future noise levels. Should project alternatives result in noise impacts, analysis of noise abatement should be completed to determine if the implementation of noise abatement would be considered reasonable and feasible.

SECTION 4 (F)

Section 4(f) properties located within or near the project corridor include parks and shared-use paths. The potential for impacts to these properties would be determined during the alternatives analysis later in this report. In the event that project alternatives would result in impacts to Section 4(f) properties, those impacts would be coordinated with the official with jurisdiction to determine the level of impact and develop potential mitigation or minimization measures.

ENVIRONMENTAL JUSTICE

Using the Grand Forks-East Grand Forks Metropolitan Planning Organization's (MPO) Environmental Justice Program Manual, it was determined that a low-income/minority block group occurs directly east of the project area between the DeMers Avenue/ND 297 and Gateway Drive/US 2 interchanges. In the event that a proposed project alternative were to be developed within this area, it would be the responsibility of FHWA to identify and address any potential disproportionately high effects of the project on minority and low-income populations.

VISUAL

The modification/addition of interchanges and overpasses could add obstructions to the view shed in the region. The potential for visual impacts should be assessed during project design. In the event that adverse visual impacts are anticipated to result from a proposed project alternative, the incorporation of aesthetic design enhancements and visual barrier should be considered to mitigate for any potential adverse impacts.

SOCIAL/ECONOMIC IMPACTS

All transportation projects have some level of associated social and economic impacts. One of the primary needs identified at several locations throughout the project corridor is the need for additional roadway capacity to accommodate existing and future traffic volumes. The 32nd Avenue South/US 81B interchange and DeMers Avenue/ ND 297 interchange in particular have a high amount of forecasted growth occurring within a one-mile radius. Under existing conditions, this growth is expected to overburden several intersections within the corridor resulting in deficient traffic operations. This breakdown in traffic operations would have associated social and economic impacts to the traveling public as well as businesses within the study area. Improving overall traffic operations would satisfy these social demands and promote economic development within the surrounding area.

Positive social impacts may also be realized through the incorporation of additional shared-use paths and pedestrian facilities into project alternatives. As highlighted previously, there are currently significant gaps in the overall network of pedestrian facilities throughout the project corridor, particularly in terms of east/west connectivity across I-29. Incorporation of additional facilities would satisfy this need and have positive social impacts to users and the surrounding community.

Project alternatives may also have the potential for negative social and economic impacts in the form of buyouts/relocations. Previous studies have identified the potential for interchanges at 47th Avenue South and Grand Forks County Road 6, as well as an overpass at 17th Avenue South. Construction of these facilities would require the acquisition of right-of-way from adjacent land owners and could potentially result in the buyout/relocation of adjacent businesses. At 47th Avenue South, cropland comprises the majority of the existing land use with the exception of the southwest corner which is currently occupied by the Grand Forks Campground/RV Park. Construction of an interchange at this location would likely necessitate a buyout/relocation of this business. Additional potential for relocations identified in previous studies include the McDonalds restaurant northeast of the Gateway Drive/US 2 Interchange. Preliminary concepts for redesigning this interchange have identified the potential for right-of-way acquisitions within this area.

ALTERNATIVE EVALUATION

Alternatives are presented in later chapters of this study. The information provided in this chapter will be critical to screen alternatives and evaluate planning level environmental impacts as detailed below.

- » **Screen Alternatives.** According to 23 CFR 450 Appendix A (Linking the Transportation Planning and NEPA Processes), there are two ways in which the transportation planning process can limit the alternative solutions to be evaluated during the NEPA process: (a) shaping the purpose and need for the project or (b) evaluating and eliminating alternatives from detailed study in the NEPA process prior to its start.
- » **Evaluate Planning Level Environmental Impacts.** Alternatives were evaluated using a planning level assessment of environmental impacts. Impacts will be evaluated quantitatively where possible (i.e. acres of ROW impacts) with certain impacts evaluated qualitatively (i.e. social).

Figure 5-1: Environmental Considerations

