

Interstate 29 Traffic Operations Study

Scope of Services

The purpose of this document is to outline the scope of services for the Interstate 29 Traffic Operations Study in Grand Forks, ND. The 10 mile study area for this project extends from the Grand Forks Country Road 11/North Washington Street interchange to the north to the Merrifield overpass to the south.

Project Management

KLJ will provide ongoing coordination and communication with the GF-EGF MPO and NDDOT Project Manager throughout the development of the study to address any concerns or issues that may arise. KLJ will provide internal Quality Assurance/Quality Control (QA/QC) of all products developed prior to them being released to the Study Review Committee and the public.

In addition to scheduled steering committee and public input meetings, KLJ would plan to attend every TAC meeting throughout the duration of the project to provide an update. The only meetings KLJ would not plan to provide an update is when there is a Steering Committee meeting scheduled for that month.

Deliverable I: Existing Conditions Memorandum

The first phase of the project is to identify existing issues along the study corridor. This involves a variety of field exercises and technical analyses. The results of this phase will be documents in an "Existing Conditions Memorandum."

Task 1.1 - Data Collection

Turning Movement Counts: It is important that logical termini are included in the analysis. According to FHWA guidance, the two closest major intersections in each direction should be included during interchange analysis. The following study areas will be analyzed;

- Grand Forks County Road 11: 70th Avenue, West Ramp, East Ramp and 54th Avenue
- Gateway Drive: 48th Street, West Ramp, East Ramp, 43rd Street and 42nd Street
- DeMers Avenue: 48th Street, 46th Street, West Ramp, East Ramp, Cenex Driveway and 42nd Street
- 17th Avenue: 48th Street and 42nd Street
- 32nd Street: 42nd Street, West Ramp, East Ramp and 38th Street
- 47th Avenue: intersection data and characteristics with a proposed overpass or interchange will be generated using travel demand model outputs in concert with forecasted travel patterns and surrounding trip generation characteristics.

- Merrifield: 42nd Street/12th Street and CR 17/South Columbia Drive. New ramp intersections will be generated using travel demand model outputs in concert with forecasted travel patterns and surrounding trip generation characteristics.

Much of this data has recently been collected as part of the US 2 Corridor Study, preliminary IAR for 47th Avenue interchange or 42nd Street and DeMers Avenue interchange. Additionally, MPO staff is currently collecting data at the interchange ramps. It was assumed that all intersection turning movement counts would be collected by MPO staff.

For mainline regional traffic data, KLJ would set up cameras at the north and south termini to count traffic as it enters the system. Twelve hours of data will be collected at each location to gain an understanding for daily passenger vehicle and truck distributions.

At 32nd Avenue, the primary generators are commercial and often produce high volumes of traffic during the weekend peak hours. Specifically, traffic is generated internally to Grand Forks and East Grand Forks, but also regionally as far north as Canada. KLJ will use the “Traffic Analysis Tool” developed by ATAC to evaluate weekday versus weekend count information. This tool uses video detection units to collect and analyze daily, weekly, monthly and annual traffic patterns. Based on this comparison, it will be determined whether additional data should be collected and analyzed during the weekend peak hours, if weekend peak hours should be estimated using adjustment factors from the Traffic Analysis Tool or if weekday peak hours are adequate for analysis. This will only be conducted at 32nd Avenue.

Calibration Data: Calibration is a critical aspect of developing a reliable model. The following three approaches will be used to calibrate the traffic model (discussed below);

- A speed study will be conducted on I-29 between 32nd Avenue South and DeMers Avenue to calibrate mainline I-29.
- A queue length study will be conducted at the 32nd Avenue interchange to calibrate intersection operations. This will be supplemented by a similar study completed at the US 2 interchange during the US 2 Corridor Study.
- The entire model will also be calibrated to collected traffic data.

Task 1.2 - Site Inventory

KLJ will conduct both a field and desk inventory of the study area. This will involve collecting and verifying a variety key deficiencies and strengths of the corridor. The inventory will include collecting pertinent information regarding functional classifications, funding classifications, land use, geometries, typical sections, ROW, utilities, lighting, railroad conflicts, access control and others.

Task 1.3 - Infrastructure Conditions

KLJ will evaluate NDDOT reports for pavement distress index and bridge sufficiency ratings as well as review construction and rehabilitation histories. This information is pertinent in understanding needs of the corridor but also when evaluating implementation and timing of future improvements. Regardless of whether expansion or reconfiguration is needed, the report will need to identify and/or confirm rehabilitation needs of the corridor.

Task 1.4 - Multimodal Assessment

KLJ will conduct a field review of existing infrastructure from the perspective of all modes of transportation; vehicle, bike and walking. This allows KLJ to understand the needs of each transportation mode instead of developing a strictly vehicle-focused plan. The focus of the pedestrian and bicycle analyses will be to identify connectivity barriers, conflict points and amenity gaps.

Although transit access is limited within the study area, as development increases around I-29 into the future, the demand for transit will increase. KLJ will use outputs from the travel demand model to identify areas with employment or development densities conducive to transit activity. This will be a very high level analysis understanding the MPO Transit Development Plan is scheduled to begin in 2016.

Task 1.5 - Traffic Operations

Traffic operations analysis will be conducted during existing and future AM and PM peak hours. KLJ will use the following tools to evaluate existing conditions, future conditions and potential build alternatives;

- Vissim will be used from the US 2 Interchange to the potential 47th Avenue Interchange extents. Vissim is a micro-simulation model capable of evaluating not only capacity, congestion and operations from traffic control but also from merging, diverging and weaving environments. This model will be used for both interchange evaluations and mainline analysis.
- Synchro will be used at Grand Forks County Road 11 and Merrifield Road. These areas won't involve the same merging, diverging and weaving complications as the rest of the corridor. Synchro is a deterministic model based on Highway Capacity Manual equations.

Task 1.6 - Crash Analysis

Safety is of utmost importance when evaluating a corridor and reviewing historic crash information is vital to identifying existing deficiencies. Critical crash analysis and crash frequency analysis will be conducted to identify overrepresented crash locations and crash clusters. Critical crash analysis is a statistical methodology designed to highlight areas with an overrepresentation of crashes based upon similar conditions.

Task 1.7 - Travel Time Reliability

KLJ will utilize the SHRP 2 “Reliability Module” to evaluate travel time reliability. It is a sketch planning corridor spreadsheet tool based on SHRP 2 Reliability Project L03, *Analytic Procedures for Determining the Impacts of Reliability Mitigation Strategies*, to estimate the benefits of improving travel time reliability for use in benefit/cost analysis. This can be used to identify the benefits of incident management activities.

DELIVERABLE II: Future Conditions Memorandum

The second phase of the project is to identify future issues along the interstate system through 2040. Evaluating future conditions always involves a great degree of uncertainty. KLJ has developed an approach that evaluates a variety of future scenarios to allow the Steering Committee to make the most informed decision about future conditions. The results of this phase will be documented in a Future Conditions Memorandum.

Task 2.1 - Land Use

KLJ will evaluate land use assumptions from the previous Land Use Plan and LRTP to evaluate whether adjustments and refinements are necessary. KLJ will work with the MPO’s Land Use consultant to understand whether changes are likely in these areas. Of specific concern are the areas surrounding the 32nd Avenue and potential 47th Avenue interchange locations. KLJ has budgeted time to evaluate whether minor revisions to the travel demand model are necessary to allow for detailed analysis at future crossings (i.e. 47th Avenue).

Task 2.2 - Background Regional Traffic

Travel demand models often under- or over-produce forecasts on the fringes of a metropolitan area due to the uncertainty of traffic volumes to/from external nodes. A review of assumptions on the external node of the I-29 indicates that a two to 2.5 percent annual growth rate was assumed for future scenarios. Based on a review of historic traffic volumes, this is a slight under-production when evaluating traffic growth over the past 20 years but a dramatic over-production when compared to trends over the past five to 10 years.

Providing an accurate growth rate on the external node of the travel demand model can change forecasts along I-29, a primarily regional corridor, by several thousand vehicles a day. KLJ will evaluate growth assumptions at the external node and evaluate the following scenarios:

- **High Growth Scenario:** growth rate using 20 years of historic data
- **Medium Growth Scenario:** growth rate using 10 years of historic data
- **Low Growth Scenario:** growth rate using 5 years of historic data



KLJ will provide data inputs to ATAC to include in the travel demand model. KLJ will then evaluate and present results to the Steering Committee. The Steering Committee will then select the preferred background regional growth scenario.

Task 2.3 - Metro Traffic generation

Two major factors contribute to a city's reliance on the interstate system for local trips; availability of operations of parallel arterials and reliance on the automobile. KLJ will evaluate the following three scenarios for metropolitan traffic volume scenarios. KLJ will provide data inputs for each scenario to ATAC to include in the travel demand model. KLJ will then evaluate and present results to the Steering Committee. The steering committee will then select the preferred regional and metro growth scenario.

Base Scenario

This scenario uses the current assumptions in the travel demand model for trip generation and operations on parallel route alternatives.

Travel Demand Management Scenario

As evidenced by UND's Climate Action Plan and the Green Grand Forks Action Plan, there is a clear focus on alternative modes of transportation and reducing vehicle emissions. According to a Transportation Research Board (TRB) study, a vehicle trip reduction of up to five percent is possible through the implementation of a system wide transit and travel demand management program (TDM).

Travel demand management is an action or set of actions aimed at influencing people's travel behavior in such a way that increase the use of alternative mobility options to reduce traffic congestion. Typical strategies of this nature include implementing high density land use policies conducive to transit use, encouraging alternatives to single occupancy vehicles (i.e. carpools, vanpools, transit, bicycles etc.) and implementing alternative work hour programs such as flex-time, compressed work weeks and telecommuting.

Using this information, KLJ would have ATAC apply a 5 percent reduction on trip generation rates in the 2040 travel demand model outputs to determine the implications to volumes on the interstate.

Constrained funding Scenario

The major challenge facing the Grand Forks transportation system is funding. Recently, NDDOT has indicated that federally-funded projects may need to be delayed due to funding constraints introduced through continued delays regarding a long term extension of MAP-21 and a permanent fix to the Highway Trust Fund (HTF). Based upon the challenging financial landscape nationally, most specifically the HTF, there is the potential for continued delays in the delivery of Federal aid projects in the years

ahead. The funding reduction scenario will amount to a 20 percent reduction in currently constrained expenditures in the GF/EGF 2040 LRTP. KLJ will take the fiscally-constrained list of projects in the LRTP and develop an across the board 20 percent reduction in constrained expenditures.

KLJ will work with MPO staff to determine which projects to remove in this scenario. Based on preliminary discussions, it was noted that the reduction would be concentrated on roadways not on the state system. This will likely impact roadway connectivity to the growth areas surrounding 47th Avenue, impacting growth potential in this area.

Task 2.4 -Traffic Operations and Traffic Control

KLJ will conduct traffic operations analysis for future conditions. This will not be conducted until the refinements to the travel demand model are made and sensitivity analysis scenarios evaluated and selected by the Steering Committee. This analysis will not only identify operational deficiencies and needs but also identify opportunities for improved traffic control.

Steering Committee Meeting #1: Existing and Future Needs Assessment

This first meeting will serve as a combined project kick-off and existing conditions summary. The Existing Conditions Report will be presented to allow the Steering Committee to provide background and insight on these items as well as provide feedback on other potential items to address.

The background analysis for the Future Conditions Memorandum will be completed as this time and presented to the Steering Committee. Before this memorandum can be fully completed, KLJ will require feedback regarding which traffic growth scenarios to pursue. Once background scenarios are identified, then future no-build traffic operations analysis can be completed.

Deliverable III: Environmental Assessment Memorandum

KLJ will follow the Planning and Environmental Linkage (PEL) process (as provided in Appendix A of 23 CFR 450 Linking the Transportation Planning and NEPA Processes) to develop a project purpose and need, analyze alternatives and evaluate environmental impacts and mitigation, all within the framework that can be used in a future NEPA process. The PEL process will ensure that decision makers take into account environmental, community and economic goals throughout the project life cycle, from the planning stage through development, design, construction, and maintenance. The results of this phase will be documented in the Environmental Assessment Memorandum.

Task 3.1 - Purpose and Need Statement

KLJ will develop a purpose and need statement to guide alternatives analysis for the project corridor. The MPO's transportation planning process is the primary source of the project purpose and need. In addition, the development of the purpose and need statement will be supplemented by input from the Steering Committee and public input meetings. The purpose and need will utilize the MPO's transportation planning process by referencing the multi-modal goals and objectives, while taking financial constraints into consideration. The use of these planning-level goals and choices must be appropriately explained to streamline future NEPA scoping and document preparation. Examples of critical areas to be address in the purpose and need statement are capacity, system linkage, transportation demand, social demands or economic development, modal interrelationships, safety and roadway deficiencies.

- **Capacity** – The 2040 LRTP forecasts capacity issues at several existing interchanges due to increased traffic from growth in the region.
- **System Linkage** – The proposed alternatives may provide a “connecting link” in the existing transportation system by providing new or expanded interchanges and overpasses along the I-29 corridor.
- **Transportation Demand** – New and proposed development in the region is placing increased demands on existing infrastructure.
- **Social Demands or Economic Development** – The proposed alternatives may provide new employment opportunities, benefit schools, facilitate land use plans, and affect recreation facilities within the vicinity of the project corridor.
- **Modal Interrelationships** – KLJ will conduct a full review of existing infrastructure perspectives, including vehicles, mass transit services, bicycles and pedestrians. This review will help determine the need level associated with connectivity barriers, conflict points and amenity gaps.
- **Safety** – The alternatives will be analyzed to determine effects on crash potential within the corridor, as well as improved bicycle and pedestrian safety.
- **Roadway Deficiencies** – A site inventory will be conducted to evaluate the existence of substandard geometrics, load limits, typical sections, lighting, access control, etc.

Task 3.2 - Assessment of Environmental Conflicts and Barriers

An inventory of the existing environment will be taken by KLJ to provide the necessary baseline information required for evaluating potential environmental impacts. This information will be a strong resource for developing alternatives that will avoid or minimize impacts. In addition, the documentation will include a reasonable level of detail and will provide a discussion of the potential environmental mitigation activities and potential areas for their implementation. The collection of baseline information will rely heavily on information already available from agencies responsible for environmental resources (USFWS

NWI maps, NRCS Web Soil Survey, EPA EnviroMapper, NDSHPO file search, etc.). In addition, KLJ will conduct an on-site visit to document existing conditions within the project corridor. However, this on-site assessment would not entail wetland delineations, noise receptor analysis or cultural resource surveys. The analysis of baseline information will be of sufficient detail to screen out “fatal flaws” associated with design alternatives.

The assessment of environmental conflicts will look at the following criteria, if applicable in the context of the study area: land use, prime and unique farmlands, social, relocations, economics, pedestrians and bicyclists, air quality, noise, water quality, wetlands, water body modification, wildlife and invasive plant species, floodplains, state scenic river, threatened and endangered species, cultural resources, hazardous waste, visual, energy, trees, temporary construction, low income and minority living areas, and Section 4(f) and Section 6(f) involvement.

Based on a preliminary analysis of the study area, KLJ believes there are potential areas of environmental concern:

- **Social** – The modification/addition of interchanges and overpasses will impact the development of communities within the vicinity of the project corridor.
- **Relocations** – The environmental memorandum would assess the possibility of relocation of existing buildings and infrastructure along the corridor. Examples include the McDonald’s next to US Highway 2 and the campground at 47th Avenue South.
- **Economics** – The development of alternatives would take a close look at the economic impacts associated with the modification/addition of interchanges and overpasses. Additional traffic flow and ease of movement of people and goods would have a large impact on the surrounding community.
- **Pedestrians/Bicyclists** – The project would take a multi-modal approach to alternative development. The addition/improvement of pedestrian and bicyclist facilities would benefit users within the vicinity of the project corridor.
- **Noise** – The modification/addition of interchanges and overpasses could potentially lead to impacts to noise sensitive buildings, residences or campgrounds in the vicinity of the proposed alternatives.
- **Wetlands** – The proposed alternatives could lead to wetland impacts. Existing USFWS NWI maps will be used to determine approximate impacts.
- **Visual** – The modification/addition of interchanges and overpasses would add additional obstructions to the view shed in the region.
- **Section 4(f) and Section 6(f)** – There are no Section 4(f) or Section 6(f) properties along the project corridor. The campground adjacent to 47th Avenue South is not a publicly owned recreation area, nor was the land acquired with Land and Water Conservation Act funds; therefore, Section 4(f) or Section 6(f) impacts would not occur.

Task 3.3 - Development of a Screening and Prioritization process

A methodology will be developed that follows guidance regarding the linking of planning and NEPA, pursuant to 23 CFR 450 Appendix A. Accordingly, 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.

Preliminarily, it is anticipated that the framework of the screen and prioritization process will be as follows. This will be refined and adjusted based upon feedback from the Steering Committee. This approach has been successfully employed by KLJ in the past to eliminate alternatives that do not meet purpose and need while having the least potential to cause environmental harm.

1. First Screening Criteria: Does not meet Purpose and Need of the project
2. Second Screening Criteria: Does not have benefit/cost ratio greater than one
3. Project Prioritization: A scoring criteria will be developed to rate the following critical impact and benefits areas. Based on feedback from the Steering Committee, these criteria will be weighted to accurately reflect the context of the projects and values of the community.
 - o Local operations: the alternatives effect on arterial operations (i.e. ramp intersections and adjacent intersections)
 - o Mainline operations: the alternatives effect on I-29 mainline operations
 - o Safety: the alternatives effect on crash potential
 - o Environmental impacts: the alternatives impacts on any number of environmental issues identified earlier in the process
 - o Cost: the cost for construction, engineering, land acquisition and utility impacts

Steering Committee Meeting #2: Environmental Assessment

The second steering committee meeting will contain three parts. First, the final results from the Future Conditions Memorandum will be presented. Second, KLJ will present the Environmental Assessment for comment and review. The Steering Committee and project team can work together to find strategies to mitigate or avoid major environmental impacts to incorporate in later alternatives analysis. The final item for discussion at this meeting will be preparation for the first public input meeting.

Public Input Meeting #1: Transportation Needs and Environmental Constraints

The first public input meeting will focus on the needs of the corridor and environmental constraints. KLJ will present on the first three technical memorandums: Existing Conditions, Future Conditions and Environmental Assessment. The purpose of this meeting is to gain as much feedback as possible regarding the issues to focus on and identifying constraints that may become fatal flaws as the project progresses.

The first public input meeting will be a series of events designed to engage a variety of roadway users.

Roving Displays. I-29, more than any other corridor in the area carries regional traffic that is unlikely to be engaged through the typical meeting invitation approaches. Getting the public involved early is crucial for the success of the project. To actively reach out to the driving public, KLJ proposes the use of roving displays at high traffic locations along the corridor. This approach not only actively informs the public of the project but it allows the study team to strategically target people who use the interstate. Roving displays manned by 1 or 2 members of the project team will be strategically placed at the following locations. The times and locations below are pending approval of each establishment.

- 12:15-1:15 PM - Stalmart on Gateway Drive (US 2) and I-29
- 1:30-2:30 PM - Simonsons on Gateway Drive (US 2) and I-29
- 2:45-3:45 PM - Cenex on DeMers Avenue and I-29
- 4:00-5:00 PM - Cenex – 32nd Avenue and 38th Street
- 5:15-6:15 PM - Flying J Travel Plaza - 32nd Avenue and I-29
- 6:30- 7:30 PM - Canad Inn adjacent to the DeMers Avenue and I-29 Interchange

Roving displays will provide a brief synopsis of issues, deficiencies and constraints setup on boards. This will also include a large aerial for the public to post notes about issues. Public comment cards and sign-in sheets will also be provided.

Open House and Formal Presentation. An open house and formal presentation will also be held. During the open house, the roving displays, including comment cards, will be used allowing the public to identify specific deficiencies.

Webinar and Chatroom. During the open house and formal presentation, a webinar with online chatroom will be open for people to engage and ask questions to the study team. This will allow those unable or not interested in attending in person to participate in the project.

Advertisements. Refer to Task 8.1 for details on how the meeting will be advertised.

Deliverable IV: Macro-Level Scenario Analysis Memorandum

The KLJ alternatives analysis approach employs two levels of analysis: macro and micro-level. Microscopic analysis is time and cost-intensive so using a macro-level approach first, allows some of the higher level decisions to be effectively made without the costs associated with micro-level analysis. This also allows for multiple opportunities for Steering Committee review and feedback. The results of this phase will be documented in a “Macro-Level Scenario Memorandum.”

The macro-level approach will primarily utilize the regional travel demand model as an analysis tool. KLJ will work with ATAC to develop travel demand model outputs to compare a variety of future major infrastructure scenarios. These are grouped below by issue.

Using travel demand model outputs and high-level planning cost estimates, KLJ will conduct a benefit/cost (B/C) ratio comparing the costs (construction, engineering, right-of-way) versus the travel delay and travel time benefits to vehicles and trucks network-wide. Differing benefits would be assigned to passenger cars and freight understanding the increased value of delays in the freight industry, a critical consideration on a corridor so vital to regional, national and international freight movement. The analysis timeframe would use the study horizon of 2040 but would incorporate future assumptions to accommodate the lifespan of these major structures.

Alternatives will be discarded from further analysis using the criteria established in the Environmental Assessment portion of the proposal/project. This includes screening using PNS then B/C ratio. Each alternative will first be analyzed in isolation identify benefits unique to the alternative. Later, alternatives that are not discarded will be combined to evaluate cumulative network-wide benefits.

Task 4.1 – Merrifield Road Interchange Analysis

KLJ would evaluate benefits and costs associated with a Merrifield crossing under the following scenarios:

- With an interchange at Merrifield Road without a river crossing and other bypass improvements.
- With an interchange at Merrifield Road along with a full south-end bypass including river crossing at Merrifield Road.

KLJ is prepared to carry one of these alternatives into micro-level analysis.

Task 4.2 – 17th Avenue Overpass

KLJ will evaluate regional benefits and costs of a 17th Avenue overpass. Unless land use or traffic growth assumptions changes, it is not anticipated that a new overpass will be warranted according to recent analyses.

Task 4.3 – 32nd Avenue Congestion Reduction Alternatives

First, travel demand model outputs will be used to compare the following future scenarios;

- No additional interchanges or overpasses
- Overpass at 17th Avenue (if not already discarded)
- Overpass at 47th Avenue
- Interchange at 47th Avenue
- Red River crossing at 32nd Avenue

KLJ is prepared to carry three of these alternatives into micro-level analysis, one of which being the “no additional interchanges or overpasses” alternative. Based on recent analyses, it would appear that the 47th Avenue Interchange may be the most advantageous and carried forward. However, it is possible that an overpass will also provide similar benefits and thus may be carried forward as well. Based on past studies, it does not appear that a 17th Avenue overpass or new 32nd Avenue Red River Crossing will mitigate congestion at the interchange and will unlikely be carried forward.

Steering Committee Meeting #3: Macro-Level Scenario Analysis and Alternative Brainstorming

The purpose of this meeting will be to discuss the results of the Macro-Level Scenario Analysis. It is critical that the Steering Committee agree which alternatives to discard and carry forward before detailed analysis is completed. Otherwise, costly rework will likely result.

Once the Steering Committee has come to an agreement on which macro-level alternatives are carried forward, the next step will be to brainstorm potential improvement strategies for the micro-level analysis. This brainstorming session will be the foundation of specific alternatives studied at each location. KLJ will provide aerials of all study locations. The Steering Committee will then systematically go through each locations discussing, outlining and drawing alternatives and potential problem areas.

Phase V: Micro-Level Alternative Analysis memorandum

The micro-level analysis is where the traffic operations models will be used to develop alternatives at a lane and intersection level. This will include the following types of analysis:

- Mainline and intersection lane requirements and designs
- Interchange configurations such as loops, diverging diamond, single point urban interchange, etc.
- Traffic control improvements at study intersections
- Geometric Improvements
- Safety improvements
- Pedestrian and Bicycle Improvements
- ITS improvements to reduce non-recurring congestion, improve safety and increase motorist awareness
- Others as needed from the transportation needs assessment from the Existing and Future Conditions Assessments

In accordance with the Screening and Prioritization approach detailed in the Environmental section of the proposal, alternatives will be first screened using the PNS then using a B/C ratio. Next alternatives will scored and prioritized using a weighted scoring of Traffic Operations, Safety, Environmental Impacts and Costs. The results of this phase will be documented in a “Micro-Level Alternative Analysis Memorandum.”

Task 5.1 - Merrifield Road

If justified by PNS, B/C analysis and confirmed through the Steering Committee, layouts of the interchange will be developed considering forecasted traffic volumes, environmental constraints and truck accommodations. This would involve only one build configuration.

Task 5.2 - 17th Avenue

If justified by PNS, B/C analysis and confirmed through the Steering Committee, layouts of the interchange will be developed considering forecasted traffic volumes, environmental constraints and truck accommodations. This would involve only one build configuration.

Task 5.3 - 32nd Avenue and 47th Avenue

The 32nd Avenue and 47th Avenue micro-level analysis is undoubtedly where the most detail is required for this phase. This will involve detailed analysis of three scenarios.

Scenario 1: Improvements at 32nd Avenue Only

This scenario will involve evaluation of improvement strategies strictly at the 32nd Avenue interchange to accommodate future traffic volumes. KLJ will employ a tiered analysis approach to narrow the universe of alternatives to three (3) improvement strategies to analyze with microsimulation analysis. One of the three alternatives will be connect 42nd Street to the interchange. The other two will be determined using high level analysis and brainstorming at the third Steering Committee meeting.

Scenario 2: Improvements at 32nd Avenue and Interchange at 47th Avenue

This scenario will involve detailed analysis of a new 47th Avenue interchange to mitigate congestion at 32nd Avenue. The three alternatives identified in scenario 1 will be evaluated under this varied traffic scenario as well. In this scenario, three interchange configurations will be studied at 47th Avenue

- Alignment at 47th Avenue with best operational performance. This alternative will not try to mitigate impacts to the campground.
- Alignment at 47th Avenue designed to minimize impacts to the campground.
- Alignment shifted south or reconfigured to allow for 1 mile spacing between 47th Avenue and 32nd Avenue ramps.

Scenario 3: Unidentified Scenario

KLJ has budgeted for three additional scenarios to account for uncertainty. This could include an overpass/underpass at 47th Avenue, overpass at 17th Avenue, new red river crossing or a combination of these improvements. This scenario will evaluate the 32nd Avenue interchange configurations from Scenario 1 above under the new traffic

conditions. If an overpass/underpass is carried forward, this will also include planning level design and cost estimates of the alternative.

Once each scenario is evaluated, comparison between the three will be conducted to determine the most cost effective and beneficial approach to the motoring public to mitigate congestion at the 32nd Avenue interchange.

Another item to note is that LM Wind Power is located adjacent to I-29 and utilized the 32nd Avenue interchange to export wind towers. These oversized loads require special considerations during the design process.

Task 5.4 - DeMers Avenue

Build alternatives for DeMers Avenue are anticipated to be less involved than 32nd Avenue due to the reduced volumes. KLJ has budgeted for microsimulation analysis to be conducted on three (3) build alternatives. Alternatives will likely include new intersection configurations, traffic control and the potential of bridge widening. Non-recurring traffic improvements will also be evaluated to account for event traffic; train events and Alerus Center events.

Task 5.5 - Gateway Drive

This Gateway Drive interchange was recently analyzed at a micro-level with an optimal configuration identified and vetted through the US Corridor Study process. This interchange has the greatest volumes and greatest current needs meaning there is the potential that improvements at this interchange will occur in the near-future. Linking planning and NEPA is most advantageous where improvements are imminent and the planning document can transition directly into the NEPA phase. To capitalize on this opportunity to link planning with project development at this location, the following steps will be taken:

1. First, alternatives from the US 2 Corridor Study will be reevaluated under the updated traffic volume scenarios.
2. A review of the Purpose and Need statement will be conducted for the project to officially discarded alternatives that were identified as infeasible in the previous study. The Purpose and Need statement may need to be slightly refined from a corridor level to this specific location to allow it to be carried forward into project development.
3. Conduct a more refined analysis of environmental impacts to quantify specific impacts.
4. Complete more detailed refinements to the design. Critical questions such as a retaining wall versus property acquisition will be determined.
5. Property meetings with key stakeholders will be coordinated to identify any major opposition and to determine if additional accommodations are needed. This will specifically target the businesses that access 43rd Street, as this access will be revised under any improvement scenario.

Task 5.6 – Grand Forks County Road 11

The approach to Grand Forks County Road 11 will be straightforward. It will involve intersection analysis (operations, safety, geometrics, others) to determine whether new turn

lanes, traffic control of minor geometric improvements are justified. Two (2) alternatives will be developed including planning level design and cost estimates.

Task 5.7 - Mainline I-29

Once an assessment of access and interchange operations is completed, KLJ will evaluate I-29. Specifically, this will involve the following analyses and improvement strategies;

- **Traffic Operations:** Interchange access and configurations will impact traffic volumes, merging, diverging and weaving along the mainline. While much of this this will be evaluated during interchange analyses, this section will identify the capacity and subsequent lane needs along the corridor.
- **Rehabilitation Plan:** KLJ will use the LRTP as the foundation for the rehabilitation plan. This will be updated to include new information to determine where and when rehabilitation is needed along the mainline.
- **Travel Time Reliability:** Using the outputs from the travel time reliability assessment from the Existing Conditions Memorandum and updating this analysis for future conditions, a needs assessment can be developed. Once needs are identified, a range of improvement strategies can be determined. This may include a more integrated incident management plan between varied emergency responders to reduce response and clearance times. This may also include ITS enhancements such as video monitoring to reduce response times, integration with dynamic message signs to increase motorist awareness to reduce the potential for secondary crashes or others.
- **Other:** This section will look to address the other deficiencies identified during the project like safety, geometric, etc.

Steering Committee Meeting #4: Micro-Level Alternative Analysis

The focus of the fourth Steering Committee Meeting will be to discuss, evaluate and refine Micro-Level Alternatives. To build consensus and ensure the most beneficial and cost effective solution is provided for the project, KLJ recommends implementing the Value Planning (VP) process. VP is a systematic process of review and analysis of a project, during the concept and design phases, by a multi-disciplinary team to provide recommendations for:

1. Providing the needed functions safely, reliably, efficiently and at the lowest overall cost
2. Improving the value and quality of the project
3. Reducing the time to complete the project

This process is incredibly valuable in that it leverages the vast compilation of skills provided by the diverse steering committee and KLJ Team. VP, is an augmentation of the FHWA Value Engineering process, designed to be completed during the planning stage of the project. The process will last approximately six to eight hours and involves the following four steps;

1. Present Existing and Future Deficiencies
2. Committee Weights VP Factors
3. Present Preliminary Technical Analysis
4. Steering Committee Ranks and Refines Alternatives

Public Input Meeting #2: Alternatives Presentation and Assessment

The focus of this meeting will be to present the public with alternatives and generate feedback and comments regarding alternatives. Discussion of alternatives is always a spirited debate between opposing opinions. It is vital to bring all of this into one centralized meeting to allow the opposing groups to work together to build consensus. This meeting will include

- Formal presentation of Macro-Level alternatives
- Formal presentation of Micro-Level alternatives
- Keypad polling devices will be provided to all meeting attendees. The devices will be used to gauge the public's preferences regarding specific alternatives. This involvement technique not only provides instantaneous feedback but also educates stakeholders regarding others' opinions regarding the corridor.
- Break-out into focus areas for each segment of the corridor for those stakeholders wanting more detailed information. Each breakout table will be represented by a member of the project team.

This meeting will be available via webcast to allow participants to be engaged remotely. Advertising for the meeting will follow the outline in Task 8.1.

Deliverable VI: Implementation Plan Memorandum

The focus of the Implementation Plan is to devise a process and plan to take the planning level recommendations and turn them into construction projects. This will first involve project prioritization then a discussion of next steps. The results of this phase will be documented in an "Implementation Plan Memorandum."

Task 6.1 - Project Prioritization

The development of a prioritization process will assist with the staging of identified needs within the study area. KLJ will use the GF-EGF TIP prioritization process to assist in this effort. Further, KLJ will bring forward the Goals, Objectives and Performance Measures from the current 2040 LRTP to ensure identified projects fit within the policy framework established with the 2040 LRTP.

KLJ will be responsive to the current fiscal constraint element of the both 2040 LRTP and the approved Transportation Improvement Program (TIP). Through this task, KLJ will evaluate existing financial estimates established within the 2040 LRTP to determine if needs identified within the I-29 Corridor Study would justify an amendment to either the 2040 LRTP or the 2016-2019 TIP (which would be effective at the time of study completion).

KLJ will utilize the following approach to help guide the project prioritization:

1. Identify short-term projects that can be implemented within existing budgets and do not need to be included within the TIP. Examples include signal timing, striping, taper adjustments, turn lane storage extensions, etc.
2. Assessment of projects already included in the TIP and LRTP. This approach tries to manipulate existing projects to incorporate needs and recommendations identified as part of this study.

3. Estimate future time periods when it is anticipated that congestion will trigger new improvements or rehabilitation projects will be required. For example, if 32nd Avenue operates deficiently, what year will this occur? Using this information helps set schedules for when new improvements would be warranted.
4. Work with NDDOT to determine updated funding forecasts to determine if/when new projects can be incorporated into the LRTP. If no new funding is anticipated, then identify if existing projects should be removed to accommodate new projects.
5. Develop recommendations for LRTP amendments and TIP considerations including timing, costs, intended funding source, jurisdictional splits and how local entities plan to fund their share of the project.
6. Alternatives that cannot be included in the LRTP will be prioritized for future consideration.

Task 6.2 - Next Steps

Once improvement plans are refined or narrowed, KLJ will develop a detailed plan for next steps. This will include identifying project milestones including timelines for initiation of the NEPA document, right-of-way (ROW) acquisition, project construction year, etc. This is an important piece of the project as it helps jurisdictions decide when to start allocating funds for project development and begin construction major deficiencies occur.

The level of detail for each project will be dependent on the timing of the respective project. Projects that have current needs such as Gateway Drive, may require steps to be immediately completed. Thus, this corridor study can act as the launching pad for project development to allow for seamless planning and environmental linkage to save money and expedite project delivery. Projects with later implementation dates will require less detail, but still involve an outline for next steps.

Steering Committee meeting #5: Implementation plan

The focus of this meeting will be to discuss the final results of technical analysis for alternatives and present results from the public input process up to this point. This allows the Steering Committee to determine the direction of potential improvement strategies. KLJ will facilitate a discussion regarding funding and implementation. This will require a lot of dialogue and coordination between stakeholders. It is likely that for a new project to be incorporated into the LRTP, a separate project will need to be removed. The meeting will end with a discussion of next steps for each project.

Deliverable VII: Final Report

Task 7.1 - Draft and Final Report

The intermediate memorandum deliverables will be designed as chapters of the final report. This allows for seamless and efficient consolidation of the final report. The final report will be easy to read and visually engaging. The KLJ team understands that long reports are unappealing and are rarely read or reviewed by the public. Thus, the final report will include

an executive summary that can be produced in a concise poster/brochure format to be handed out to the public and local stakeholders to increase project awareness and create support.

Task 7.2 - Interstate Access Revision Appendices

For new access onto an interstate, an interstate access revision (IAR) report is required for NDDOT and FHWA approval. The following IAR reports will be appendices and designed in a fashion that can be separated from the final report and used independently. Revisions to existing interchanges or overpasses without access to the interstate system do not require the same level of detail as an IAR and were thus not included as an Appendix.

- **47th Avenue IAR Appendix:** This appendix will take a planning level look at a new interchange at 47th Avenue (if justified within the analyses). This can be used by the City or NDDOT for preliminary review by FHWA to allow for ROW acquisition and initiation of project development phases. This will review project conformance with FHWA guidelines for a new access onto I-29.
- **Merrifield Road IAR Appendix:** This will be the same as the 47th Avenue IAR Appendix. Again, this will only be completed if a new interchange is justified as part of the analysis for this project.

Task 7.3 – Report Comments and responses Appendix

This project will involve a multitude of memorandums and final reports and appendices. Throughout the process, the Steering Committee and public will constantly provide comments. For transparency and accountability, the study team will develop a working document that denotes all comments received and how each comment was addressed. This final document will be included as an appendix.

Public Input Meeting #3: Presentation of Draft Report

The final public involvement meeting will involve a presentation of the entire planning process but focus on the final set of alternatives, implementation plan and funding assessment. At this meeting, KLJ will also present how public comments were incorporated into the plan to build compromise.

This meeting will be available via webcast to allow participants to be engaged remotely. Advertising for the meeting will follow the outline in Task 7.1.

Presentation of Draft Report to Major Decision Making Bodies

KLJ will also present the draft report with a specific emphasis on deficiencies, corresponding improvement alternatives and the implementation plan to the following major decision making bodies:

- Grand Forks Service/Safety Committee
- GF-EGF Executive Board
- NDDOT Upper Management

Deliverable VIII: Public Involvement

KLJ has developed a public participation plan designed to engage the public and stakeholders early and often to build compromise between opposing parties. The details of each meeting are included within the approach above, located chronologically to illustrate when they will occur. To summarize, the following meetings will be conducted as part of this project.

- Steering Committee Meetings
 1. Existing and Future Needs Assessment
 2. Environmental Assessment
 3. Macro-Level Scenario Analysis and Alternative Brainstorming
 4. Micro Level Alternative Analysis
 5. Implementation Plan
- Public Input Meetings
 1. Transportation Needs and Environmental Constraints
 2. Alternatives Presentation and Assessment
 3. Presentation of Draft Report
- Other Presentations;
 1. Presentation to Grand Forks Service/Safety Committee
 2. Presentation to GF-EGF Executive Board
 3. Presentation to NDDOT Upper Management

The final deliverable will be an Appendix summary of all public involvement activities and comments.

Task 8.1 – Public Engagement Activities

KLJ has developed a very aggressive approach to engaging the public as part of this project. A variety of activities and meeting notification strategies are proposed.

Meeting Notification Flyers

KLJ will develop flyers for each public input meeting and work with MPO staff to send the flyers out to every property owner within ½ mile of the corridor.

Interactive Webcast

Each public input meeting will include an interactive webcast, allowing the public and decision makers to view the meeting from the comfort of their home or participate if they are out of town. The webcast facilitates active participation by entering questions and comments into the chat-pod. These can also be recorded and uploaded online to allow the public to watch at a later date.

Local Media

Advertisements and information will be provided to local newspapers and news stations as well as posted to the MPO website. This ensures that the overall community is engaged and informed.

Dynamic Message Sign Advertisements

KLJ would propose advertisements for the study be placed on the NDDOT owned and operated Dynamic Message Signs (DMS) along I-29. This strategically targets motorists using the facility. Currently DMS are located between CR 11 and Gateway Drive for SB traffic and south of 32nd Avenue for NB traffic. KLJ would propose the DMS be used to share

- Information regarding the Public Input Meeting the week of the meeting.
- Information on the MPO or project website the day a new deliverable has been uploaded to the website.

Social Media

KLJ understands the easiest way to interact with younger age cohorts is through social media. KLJ will work through a variety of social media outlets to increase awareness of public input opportunities. This will include the following: KLJ, MPO, NDDOT, local news and media and City of Grand Forks social media outlets.

Engagement Incentive Program

Each person who provides both a comment and signs up for Facebook, Twitter or E-mail updates become eligible for a drawing for gift cards. This approach incentivizes the public to become engaged in the project allowing the study team to follow-up directly with updates on the project.

Roving Displays

Refer to Public Input Meeting #1 for details.

Interactive Public Meetings.

Refer to Public Input Meeting #2 and #3 for details.