

# Rethinking I-94 Evaluation Criteria: Scoping Decision Document (SDD) and Tier 1 EIS

Evaluation criteria have been developed for the Scoping Decision Document (SDD) and Tier 1 Environmental Impact Statement (EIS) phases of Rethinking I-94. This is the first step of the alternative evaluation process. The criteria used in the SDD and Tier 1 EIS have been developed concurrently for review and general agreement. Following the Scoping phase, the Tier 1 EIS evaluation will be reassessed to refine criteria as needed.

## Categories and Subcategories

There are four main categories of criteria with several subcategories under each. The four main categories include: purpose and need; social, economic, and environmental (SEE); Livability framework (goals); and additional considerations. Purpose and need categories have been identified for mainline and access alternatives based on transportation needs in the corridor. SEE impact categories have been identified based on resources in the corridor and criteria that could have a discernable variation at Scoping Decision Document (SDD) and Tier 1 stages of design and could result in findings with major impacts. Livability categories address goals and the Livability framework developed during Rethinking I-94 Phase 1. Additional consideration categories subsume factors concerning cost, maintenance, and consistency with adopted plans.

## Measures

For each subcategory, at least one criteria and measure has been identified to evaluate whether the alternative addresses the purpose and need, impacts SEE resources, or is consistent with the Livability framework. Measurements include a mixture of quantitative and qualitative assessments. For measures with minimum standards, minimum performance criteria have been identified based on MnDOT or FHWA standards. Many of the standards and performance criteria have been documented in subject area technical memos.

Purpose and need, SEE impact items, and goals and Livability categories will be evaluated by either comparing the alternative to the No Build or based on the subcategory's performance measure. For example, *Person Throughput* will be calculated for each alternative and documented as to whether it is higher, equal to, or lower than the No Build Alternative.

## Evaluation Process

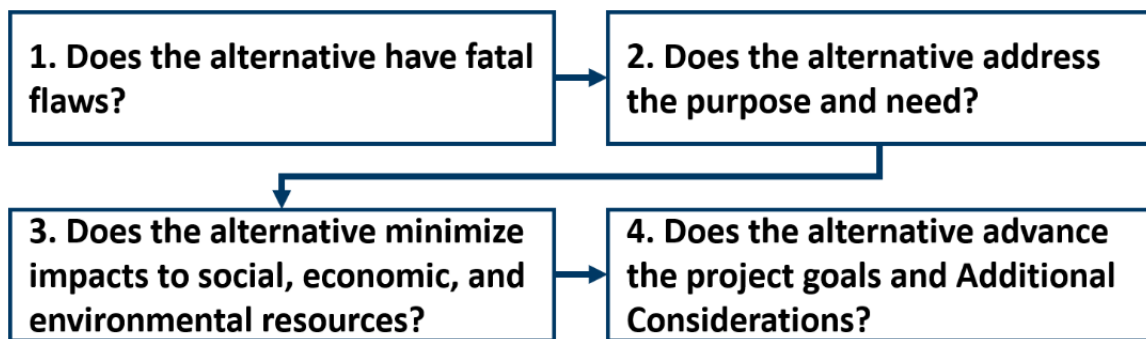
Alternatives will first be screened during the SDD Phase to determine whether they have “fatal flaws.” Alternatives with fatal flaws may not be technically or economically feasible, or they may result in SEE impacts that cannot be mitigated. For alternatives that do not have fatal flaws, the evaluation process will be first based upon the ability of an alternative to address the purpose and need criteria. Those that do not pass this screening will be eliminated as they are not “reasonable” alternatives. Alternatives that address the purpose and need will continue forward and will be further evaluated to understand the potential for and magnitude of impacts to SEE resources within the corridor. These impacts will be documented, and alternatives will then be evaluated to determine whether they address the goals and

Livability Framework pillars identified in Rethinking I-94 Phase 1 along with several Additional Considerations.

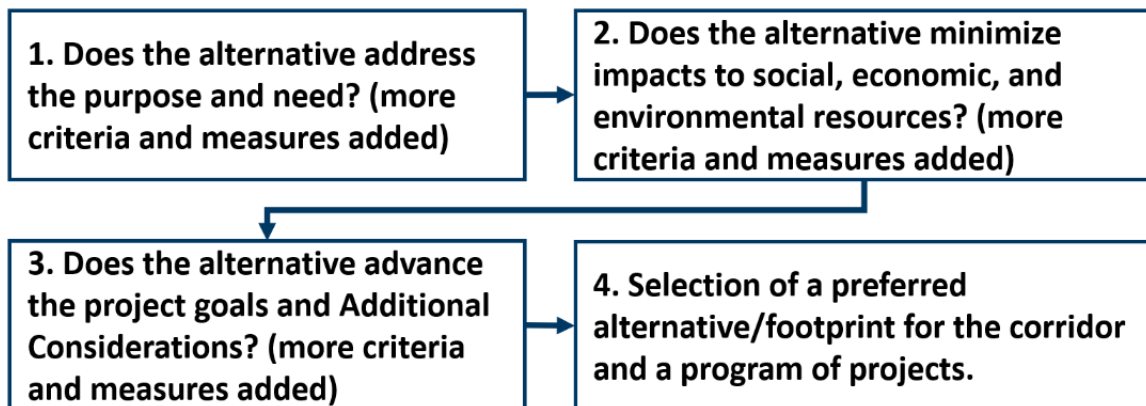
Alternatives in the SDD Phase that best address the purpose and need evaluation criteria, minimize SEE impacts, and perform favorably in terms of goals & Livability and Additional Considerations will move into the Tier 1 EIS. The Tier 1 will use the identified criteria and measures to evaluate the remaining alternatives in greater detail. Because more design information will be available, additional purpose and need, SEE impact, goals/Livability, and Additional Considerations measures will be incorporated to include items that were not expected to have substantial differences between alternatives in the SDD Phase. Evaluation in the Tier 1 EIS will first be based on addressing purpose and need criteria, followed by minimizing SEE impacts, and then meeting project goals and Additional Considerations. At the end of the Tier 1 process, an alternative that establishes the corridor footprint will be selected and a program of projects will be developed.

Tier 2 documents will be required that get into greater detail as individual projects move forward. Additional criteria may be developed during this process.

**Step 1: Scoping Decision Document (SDD) Phase**



**Step 2: Tier 1 EIS Phase**



## Topics Not Addressed in the Evaluation Criteria

There are several topics important to MnDOT and the public that are not included as part of the evaluation criteria. In some cases, this is because the level of detail in the design at this stage prevents full investigation of the alternative. In other instances, certain interests are addressed by existing MnDOT standard procedures, and will be implemented where feasible regardless of the selected alternative. For example, MnDOT uses various construction techniques to recycle pavement materials and reuse them during construction. In addition, MnDOT includes native plant species in its standard seed mixes, and is working to increase the use of native species for roadside vegetation. Light emitting diode (LED) luminaires are the standard light source for the majority of MnDOT's roadway lighting. Older roadway lighting is being replaced with LEDs and this transition will continue as projects are completed. Good lighting is also important for maintaining personal safety for people crossing the corridor. These detailed aspects of project design are examples of items that will be addressed as part of the implementation of specific projects in the Tier 2 process for Rethinking I-94.

# Rethinking I-94 Evaluation Criteria: Scoping Decision Document and Tier 1 EIS

## For Mainline and Access/Interchange Alternatives

***Bold/Italics*** = Mainline only criteria/measurement

Fill = Access/Interchange only criteria/measurement

\* For access/interchange alternatives, range to be provided since interchange footprint areas, not specific interchange types, will be defined at this stage

	Category	Evaluation Criteria	Scoping Decision Document Measurement	Tier 1 EIS Measurement	
Needs	Walkability/Bikeability	Non-Motorized Connectivity and Performance	-Distance between Crossings -Travel Time between Origin-Destination Pairs	-Multimodal Level of Service (Oregon method) -Distance between Crossings -Travel Time between Origin-Destination Pairs -Nonmotorized Conflict Points (Access/Interchange only)	
	Safety	Network Crashes	-Qualitative Assessment - Alternative addresses the number and severity of crashes along the corridor (Yes/No) -Crash modification factors (CMF) and Highway Safety Manual	-Crashes and Crash Rate Reduction -Crash Cost Reduction <b>-Qualitative Assessment - Crash comparison to similar facility types</b>	
		Safety on Intersecting Streets - Network Crashes		-Crashes and Crash Rate Reduction -Crash Cost Reduction	
	Infrastructure Condition	Pavement Condition		Qualitative Assessment - Does the alternative address pavement condition (Yes/No)	Qualitative Assessment - Does the alternative address pavement condition (Yes/No)
		Bridge Condition		Qualitative Assessment - Does the alternative address bridge condition (Yes/No)	Qualitative Assessment - Does the alternative address bridge condition (Yes/No)
		Retaining Wall Condition			Qualitative Assessment - Does the alternative address retaining wall condition (Yes/No)
		Noise Wall Condition			Qualitative Assessment - Does the alternative address noise wall condition (Yes/No)
		Drainage Condition			<b>Qualitative Assessment - Does the alternative address stormwater and catch basin condition (Yes/No)</b> <b>Qualitative Assessment - Does the alternative address stormwater and catch basin capacity deficiency (Yes/No)</b>
	Mobility	Systemwide Mobility		-Vehicle Hours Traveled (VHT) -Person Hours Traveled (PHT)	-Vehicle Hours Traveled (VHT) -Person Hours Traveled (PHT) -Vehicles Miles Traveled (VMT)
		<b>Corridor Mobility</b>		<b>Mainline Speed (average over corridor)</b>	<b>Mainline Speed (average over corridor)</b>
		<b>Corridor Throughput</b>		<b>Person Throughput (people/mile/hr)</b>	<b>Person Throughput (people/mile/hr)</b>
		Interchange Area Mobility		Vehicle Hours Traveled (VHT) in Interchange Area*	Vehicle Hours Traveled (VHT) in Interchange Area*
		Interchange Area Throughput		Person Hours Traveled (PHT) in Interchange Area*	Person Hours Traveled (PHT) in Interchange Area*
		Freight Mobility		Freight Travel Times*	Freight Travel Times*
		Travel Time Reliability		Variability of Travel Time (HCM Methodology)*	Variability of Travel Time (HCM Methodology)*
		Connectivity		-Intersection density -Qualitative Assessment - Does the alternative increase access to land use?	-Intersection density -Qualitative Assessment - Does the alternative increase access to land use?
		Transit Mobility		<b>Transit Travel Times in the Corridor</b> Transit Travel Times in Interchange Area*	<b>Transit Travel Times in the Corridor</b> Transit Travel Times in Interchange Area*
Transit Reliability		Variability in Transit Travel Times*	Variability in Transit Travel Times*		
SEE Impacts	Environmental Justice	Potential for disproportionately high and adverse effects on EJ populations	-Qualitative Assessment - Does the alternative provide access to economic opportunities and other daily needs for EJ populations? -Qualitative Assessment - Does the alternative have the potential to increase exposure to water and noise pollution for EJ populations? -Displacement potential for EJ populations	-Qualitative Assessment - Does the alternative provide access to economic opportunities and other daily needs for EJ populations? -Qualitative Assessment - Does the alternative have the potential to increase exposure to water and noise pollution for EJ populations? -Displacement potential for EJ populations	

	Category	Evaluation Criteria	Scoping Decision Document Measurement	Tier 1 EIS Measurement
SEE Impacts	Historic/Archaeological/Cemetery	Potential to affect known historic properties	-Qualitative Assessment - Low, Moderate, or High potential for adverse effect to known historic properties	-Number of known historic properties -Qualitative Assessment - Low, Moderate, or High potential for adverse effect to known historic properties
		Potential impact to known or suspected cemeteries	-Qualitative Assessment - Low, Moderate, or High potential for adverse effect to known or suspected cemeteries	-Number of known or suspected cemeteries -Qualitative Assessment - Low, Moderate, or High potential for adverse effect to known or suspected cemeteries
	Section 4(f)	Potential impact to resource	Number of Section 4(f) resources impacted	Number of Section 4(f) resources adversely affected
	Section 6(f)	Potential impact to resource	Number of Section 6(f) resources impacted	Number of Section 6(f) properties adversely affected
	Contaminated Properties	Impact to sites with potential for hazardous materials	Number of known contaminated sites impacted	Number of contaminated sites impacted
	Right of Way	Adjacent property impacts	Acreage of impacts and anticipated number of property relocations	Acreage of impacts and anticipated number of property relocations
	Noise	Potential impact to public health and welfare from traffic related noise pollution	Qualitative Assessment - Will the project cause a material change in horizontal and/or vertical alignment or add travel lanes? (Yes/No)	Representative Traffic Noise Model Analysis
	Water Pollution/Stormwater	Impervious Surface Area	Acreage	Acreage
	Air Quality	Potential impact to resource	Qualitative Assessment - is the project considered regionally significant for air quality concerns or will the project have a meaningful impact on traffic volumes or vehicle mix (Yes/No)	Compliance with Clean Air Act national ambient air quality standards
	T & E Species	Potential impact to threatened and endangered species	Qualitative Assessment - does the project have the potential to impact threatened and endangered species (Yes/No)	Low/Medium/High
	Wetlands	Potential impact to resource	-Qualitative Assessment - does the alternative have the potential to impact wetlands (Yes/No) -Number of wetlands impacted based on National Wetland Inventory mapping	Acreage of resources impacted
	Floodplain	Potential impact to resource		Acreage of resources impacted by encroachment type
	Flooding	Potential to increase flood conditions		Number and acreage of locations with increased flooding potential
	Visual Impacts	Potential impact to existing visual resources and potential viewers		-Degree of impact to visual resources (Beneficial/Neutral/Adverse) -Degree of impact to viewers (Beneficial/Neutral/Adverse)
Community Cohesion	Potential impact to community cohesion		Qualitative Assessment - does the alternative create physical barriers, increase travel times, disrupt access to care facilities, or decrease access to congregational centers? (Low/Medium/High)	
Goals & Livability	Sense of Place	Opportunities for gathering spaces, cultural and historic representation and art, and green spaces	-Qualitative Assessment - does the project have the potential to create features or amenities in partnership with communities to enhance sense of place (Yes/No)	-Qualitative Assessment - facilitates opportunities to create features or amenities in partnership with communities to enhance sense of place (Low/Medium/High) -Qualitative Assessment - (Equity) Are features or amenities available throughout the corridor? (Spatial analysis)
	Equity	Distribution of transportation resources across communities	-Qualitative Assessment - does the alternative have the potential to enhance transportation choices for individuals (Yes/No)	-Qualitative Assessment - facilitates or does not eliminate opportunities to enhance transportation choices for individuals (Low/Medium/High) -Qualitative Assessment - (Equity) Are enhanced transportation choices available throughout the corridor? (Spatial analysis)
	Economic Vitality	Opportunities for job and business accessibility	Employment opportunities (jobs) accessible within 30-minute travel time	Employment opportunities (jobs) accessible within 30-minute travel time (Percent change from No Build)
	Public Health and the Environment	Opportunities to improve quality of life, well-being, and the environment through green spaces and land use	-Qualitative Assessment - does the alternative have the potential to impact green space or land uses that benefit quality of life and the environment (Yes/No)	-Acreage that supports green spaces or land uses that benefit quality of life and the environment (Acres) -Qualitative Assessment - (Equity) Are green spaces or land uses that benefit quality of life and the environment available throughout the corridor? (Spatial analysis)
	Connectivity	Opportunities to use infrastructure to connect communities physically and socially	Qualitative Assessment - facilitates or does not eliminate opportunities to implement planned nonmotorized facilities (Yes/No)	Percent of planned nonmotorized facility-miles that are complete
	Safety	(Measured in Safety, Walkability/Bikeability categories)	(See Safety section for details)	(See Safety section for details)
Additional Considerations	Cost	Estimated Construction Cost	Dollars (cost range)	Dollars (risk-based cost range)
		Estimated Benefit-Cost		-Net Benefits -Benefit/Cost Ratio in Dollars
	Maintenance	Estimated Maintenance Cost	Dollars (cost range)	Dollars (risk-based cost range)
	Consistency with Adopted State and Regional Plans	Consistency with Adopted State and Regional Plans	Qualitative Assessment	Qualitative Assessment

# Summary of Evaluation Criteria Methodologies

This section provides a summary of the methodologies and tools that will be used for the evaluation criteria measures. Depending on the level of detail and available data, these methodologies may be applied differently for the mainline or access/interchange alternatives and at the SDD and Tier 1 EIS Phases. The descriptions below note which measures apply to the mainline or access/interchange alternatives and at the SDD or Tier 1 EIS Phases. Evaluation criteria and measures may also undergo additional refinement at the Tier 1 EIS phase.

## Project Need: Walkability and Bikeability – Experience of People

### Walking, Bicycling, and Rolling

Walkability is the ability to reach destinations safely and comfortably on foot or using a mobility device. Bikeability is the ability to reach destinations safely and comfortably by bike. Mobility and safety for these roadway users is a priority for MnDOT. Alternatives will be evaluated to measure walking and biking network connectivity and performance across and along the I-94 corridor using three measures. The distance between crossings and travel time between origin-destination pairs measures will evaluate the density of walking and biking facilities and how they provide access for walkers and bikers to travel from place to place within the corridor study area. Multimodal Level of Service (Oregon method) will be used to measure performance of the walking and biking network by evaluating the quality of facility being provided.

#### Non-Motorized Connectivity and Performance

##### Distance Between Crossings

X	SDD	X	Tier 1 EIS	X	Mainline	X	Access/Interchange
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This measure evaluates the physical distance between I-94 crossings for pedestrians and bicyclists. The distance between crossings (underpasses, multimodal bridges, pedestrian bridges, etc.) will be measured west-east/east-west to determine whether alternatives increase or decrease the spacing of crossing opportunities for pedestrians and bicyclists from current conditions. This measure will be applied at the SDD and Tier 1 EIS Phases.

##### Travel Time Between Origin-Destination Pairs

X	SDD	X	Tier 1 EIS	X	Mainline	X	Access/Interchange
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This measure evaluates how much coverage I-94 crossings provide to pedestrian generators across both sides of the corridor. Pedestrian generator activity nodes (derived from GIS datasets) will be used to determine origin and destination points along the I-94 corridor. ESRI Network Analyst will be used to perform a walkshed analysis to develop a walking service area for each crossing based upon an acceptable walking time/distance for most users. The number of pedestrian generators within the walking service area of each crossing will be calculated. Alternatives will be evaluated to determine if they increase or decrease access to pedestrian generators within the corridor. This measure will be applied at the SDD and Tier 1 EIS Phases.

Multimodal Level of Service (MMLOS)

	<b>SDD</b>	X	<b>Tier 1 EIS</b>	X	<b>Mainline</b>	X	<b>Access/Interchange</b>
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A MMLOS analysis as applied by the Oregon Department of Transportation will be performed. MMLOS results reflect the quality of service based on user perceptions generally related to safety, comfort, and convenience. Results are reported on a scale from best (A) to worst (F). MMLOS will be evaluated for both pedestrians and bicyclists. Results will be provided for segments (links) and signalized intersections (nodes). This measure will be applied at the Tier 1 EIS Phase.

Nonmotorized Conflict Points

	<b>SDD</b>	X	<b>Tier 1 EIS</b>		<b>Mainline</b>	X	<b>Access/Interchange</b>
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A conflict point is any location where the paths of road users coincide. They are the locations on the roadway where traffic conflicts are most likely to occur based upon the typical travel paths of road users. A nonmotorized conflict point is a location where a vehicle path crosses the path of a person walking or biking. Access/interchange alternatives will be evaluated based on the number of conflict points present for users of bicycle and pedestrian facilities in the proposed access modification/interchange design. Locations evaluated will include any new potential access locations created through mainline reconfiguration, modifications to frontage roads, or other changes associated with the alternatives. This measure will be applied at the Tier 1 EIS Phase.

## Project Need: Safety for People In Motorized Vehicles – Cars, Freight, and Transit

### Network Crashes

Alternative Addresses the Number and Severity of Crashes Along the Corridor; Crash Modification Factors (CMF) and Highway Safety Manual

X	<b>SDD</b>		<b>Tier 1 EIS</b>	X	<b>Mainline</b>	X	<b>Access/Interchange</b>
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At the SDD Phase, a qualitative assessment of each mainline and access/interchange alternative will be performed to determine whether they address the number and severity of crashes along the corridor. Applicable Crash Modification Factors (CMF) will also be identified.

### Crashes and Crash Rate Reduction; Crash Cost Reduction

	<b>SDD</b>	X	<b>Tier 1 EIS</b>	X	<b>Mainline</b>	X	<b>Access/Interchange</b>
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At the Tier 1 EIS Phase, each mainline and access/interchange alternative will be evaluated to determine the expected reduction to crashes. CMF from the CMF Clearinghouse for the identified improvements will be applied to the alternative to determine the expected reduction in the number of crashes. Crash rates and crash costs will be generated based on expected crash rates of similar facility types from the MnDOT Traffic Safety Intersection and Segment Toolkit “Green Sheets,” and the crash rates will be compared to the critical crash rate. Alternatives will be compared against the expected number of reduced crashes, crash rates, and crash costs.

### Crash Comparison to Similar Facility Types

	<b>SDD</b>	X	<b>Tier 1 EIS</b>	X	<b>Mainline</b>		<b>Access/Interchange</b>
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At the Tier 1 EIS Phase, each mainline alternative will be compared to existing roadways in the Metro District (or other communities in North America as needed) with similar geometric and modal characteristics to determine the potential safety implications of the proposed design at a high level. The purpose of this qualitative assessment is to account for design elements that may influence the number and severity of crashes in the corridor, but are not addressed in quantitative tools such as the HSM due to the amount of design completed at the Tier 1 level.

### Safety on Intersecting Streets - Network Crashes

Crashes and Crash Rate Reduction; Crash Cost Reduction

	<b>SDD</b>	X	<b>Tier 1 EIS</b>		<b>Mainline</b>	X	<b>Access/Interchange</b>
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Similar to the network crash analysis on the mainline and access/interchange, alternatives will be evaluated to determine the expected reduction to crashes on intersecting streets. Crash modification factors will be applied to the alternative to determine the expected reduction in the number of crashes. Crash rates and crash costs will be generated based on expected crash rates of similar facility types from the MnDOT Traffic Safety Intersection and Segment Toolkit “Green Sheets,” and the crash rates will be compared to the critical crash rate. Alternatives will be compared against the expected number of reduced crashes, crash rates, and crash costs. These measures will be applied at the Tier 1 EIS Phase.

### Project Need: Infrastructure Condition

Pavement Condition

X	<b>SDD</b>	X	<b>Tier 1 EIS</b>	X	<b>Mainline</b>	X	<b>Access/Interchange</b>
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Each mainline and access/interchange alternative proposed will be evaluated to determine if it addresses the pavement condition need. For example, if a mainline alternative would propose reconstruction, it would address the failing pavement condition. This is a qualitative measure that will be applied at the SDD and Tier 1 EIS Phases.

Bridge Condition

X	<b>SDD</b>	X	<b>Tier 1 EIS</b>	X	<b>Mainline</b>	X	<b>Access/Interchange</b>
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As part of each mainline and access/interchange alternative, impacted bridges will be evaluated for replacement or reconditioning. This is a qualitative measure that will be applied at the SDD and Tier 1 EIS Phases.

Retaining Wall Condition

	<b>SDD</b>	X	<b>Tier 1 EIS</b>	X	<b>Mainline</b>	X	<b>Access/Interchange</b>
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As part of mainline and access/interchange alternatives, impacted retaining walls will be evaluated for replacement or reconditioning. This is a qualitative measure that will be applied at the Tier 1 EIS Phase.

Noise Wall Condition

	<b>SDD</b>	X	<b>Tier 1 EIS</b>	X	<b>Mainline</b>	X	<b>Access/Interchange</b>
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As part of mainline and access/interchange alternatives, impacted noise walls will be evaluated for replacement or reconditioning. This is a qualitative measure that will be applied at the Tier 1 EIS Phase.

**Drainage Condition**

	<b>SDD</b>	<b>X</b>	<b>Tier 1 EIS</b>	<b>X</b>	<b>Mainline</b>		<b>Access/Interchange</b>
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For each mainline alternative at the Tier 1 EIS Phase, a qualitative assessment will be performed to evaluate how the alternative addresses current aging stormwater and catch basin condition and capacity deficiencies. For example, an alternative that replaces stormwater infrastructure and provides additional catch basin capacity would receive a more favorable rating than an alternative that does not improve or replace the stormwater infrastructure.

**Project Need: Mobility for People In Motorized Vehicles – Cars, Freight, and Transit**

The general definition of mobility is the ability to move freely. In transportation, mobility is the ability to move freely from one place to another place via some mode of transportation. The ability to move freely from one location to another includes a direct (not circuitous) route that is free of impediments or delays. Impediments and delays can be a result of recurring congestion, safety problems, inappropriate access spacing, poor geometrics, etc. Mobility may vary by transportation mode (walking, biking, transit or car), time of day, and the location a person is moving from and to. Walkability and bikeability measures discussed above evaluate mobility for pedestrians and bicyclists, while mobility in this section addresses motorized vehicles. Changes in the transportation network may affect mobility in locations beyond the location where the changes are being made. The mobility of one alternative compared to the No Build alternative will be measured as the difference in travel time between the two alternatives. These differences will be measured by mode, by time of day or by location.

We are proposing to measure differences in travel time for cars, trucks, and transit vehicles at the system, corridor and facility level. Although the objective is to move people and goods, not necessarily vehicles, the vehicle (a truck, bus, or car) is the primary means of moving people and goods on a roadway system, in particular a regional highway system. If the vehicles are delayed the mobility for people or freight in the vehicles is reduced. For a given number of trips, the number of vehicles needed can be reduced by increasing the number of people in the vehicles which should improve the mobility for those trips. Also reducing the length of trips will help reduce vehicle miles of travel and the demand on the roadway system which should also help improve mobility and address sustainability goals.

Incentives that can increase the number of people per vehicle may include targeting higher mobility for high occupancy vehicles and buses. Improving mobility for high occupancy vehicles may reduce mobility for other vehicles. There may also be additional travel time at either end of the trip for people to use high occupancy vehicles since in many cases the people using the same vehicle would not have the same origin or destination. For the purposes of this evaluation, mobility will be measured as follows:

System Mobility – Vehicle hours of travel on the regional system will be measured since people that have origins and destinations outside the corridor could change routes affecting the demand on other routes.

Corridor Mobility – Vehicle hours of travel on the corridor network that includes I-94, as well as parallel and crossing arterials. The corridor will include University Avenue to the north and Marshall Avenue to the south.

Facility Mobility – Travel time between logical termini (or average speed) by time of day.

Measures of connectivity are also included under the umbrella of mobility. Connectivity is defined as the number and quality of connections in a transportation network that allow people to travel from place to place. Connectivity describes the number of opportunities to access I-94 via interchange ramps, as well as travel over/under I-94 via crossings. Connectivity measures are intended to evaluate how modifications in access to I-94 and across I-94 would affect travel for transit, freight, and vehicle users. For the non-motorized connectivity analysis, see the Walkability/Bikeability section.

### Systemwide Mobility

#### Vehicle Hours Traveled (VHT)

X	<b>SDD</b>	X	<b>Tier 1 EIS</b>	X	<b>Mainline</b>	X	<b>Access/Interchange</b>
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Metropolitan Council’s Activity Based Model (ABM) for the Twin Cities region will be used to determine the vehicle hours of travel on the system. The proposed improvements will be coded into the model for each alternative. It is important to know the systemwide VHT numbers as many alternatives that improve speeds and mobility along the corridor attract trips away from other facilities to the study corridor thus benefiting the overall system, and the VHT for the corridor may not capture the full benefit provided by the project. System VHT may also be reduced by strategies that increase vehicle occupancy or reduce trip length and therefore reduce the number of vehicles on the system and/or vehicle miles of travel. This measure will be evaluated for each mainline and access/interchange alternative at the SDD and Tier 1 EIS Phases.

#### Person Hours Traveled (PHT)

X	<b>SDD</b>	X	<b>Tier 1 EIS</b>	X	<b>Mainline</b>	X	<b>Access/Interchange</b>
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The ABM will be used to estimate the PHT changes produced by each alternative at the scoping level. This metric gives preference to moving people rather than just vehicles. At the Tier 1 EIS the analysis will be completed using Transmodeler. The person hours of travel will capture the differences between alternatives that provide better travel times for multi-occupant vehicles versus the lower travel times for single occupant vehicles. This measure will be evaluated for each mainline and access/interchange alternative at the SDD and Tier 1 EIS Phases.

#### Vehicle Miles Traveled (VMT)

	<b>SDD</b>	X	<b>Tier 1 EIS</b>	X	<b>Mainline</b>	X	<b>Access/Interchange</b>
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The ABM will be used to forecast the changes in VMT by facility type for the mainline and access/interchange alternatives at the Tier 1 EIS Phase. Any alternative which moves higher amount of vehicle travel to higher functionally classified facilities is likely to provide benefits in the form of crash reductions associated with the higher-class facilities. Controlled access facilities have a track record of being safer than other types of facilities and so any alternative which increases travel on a controlled access facility while reducing the proportion of travel on other types of facilities will score better on this

metric. An overall increase in VMT will be considered a negative impact even if VHT is going down because it indicates more or longer trips with increased energy use, pollution, and user costs.

### Corridor Mobility

#### Mainline Speed

X	SDD	X	Tier 1 EIS	X	Mainline		Access/Interchange
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The corridor mobility measure will consider mobility on I-94 as well as on adjacent parallel and perpendicular arterials. The ABM will be utilized to estimate the changes in speeds on the corridor for each mainline alternative in the SDD Phase. In the Tier 1 EIS Phase Transmodeler will be used to determine mainline I-94 speeds for each alternative. Speeds will be reported as an average over the corridor for peak hours during peak periods between logical termini. The Transmodeler microsimulation model has a high resolution and can demonstrate the impacts on corridor operations as a result of changes to design which cannot be captured by a regional travel demand model. The average mainline speed provides information about the travel times on I-94. This is also relevant to freight movement in the corridor.

### Corridor Throughput

#### Person Throughput (people/mile/hr)

X	SDD	X	Tier 1 EIS	X	Mainline		Access/Interchange
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Similar to the PHT metric above, rather than just move vehicles through the corridor, mainline alternatives will be evaluated if they increase the actual number of people that can be moved in the corridor. This will be considered in the context of the ability of people to get within the project limits – at either end of the project there are constraints that can restrict the number of people that can get into the “downtown commons.” For the SDD Phase the person throughput will be determined using the ABM. At the Tier 1 EIS Phase the person throughput will be determined using Transmodeler.

### Interchange Area Mobility

X	SDD	X	Tier 1 EIS		Mainline	X	Access/Interchange
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Mobility within the interchange area will be measured using vehicle hours of travel for the roadway system affected by the interchange modifications. This will include both the local system and the freeway. The affected area will be identified based on changes in traffic on the local street system. The use of VHT will capture the effects on the local and regional system. As an example, if a ramp is removed it may cause an increase in volume on local roadways and increased delay on local roadways. This could be offset by reduced delay on the freeway in this area. By limiting the VHT consideration to the interchange area it should capture how changes affect mobility locally. This measure will be applied at the SDD and Tier 1 EIS Phases.

### Interchange Area Throughput

X	SDD	X	Tier 1 EIS		Mainline	X	Access/Interchange
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The total number of persons going through the interchange per hour will be measured to help determine which alternative provides the highest person throughput. This measure will be very similar

to the vehicle throughput unless the alternative involves HOV/HOT lanes or transit advantages such as bus shoulders. This measure will be applied at the SDD and Tier 1 EIS Phases.

### Freight Mobility

X	SDD	X	Tier 1 EIS	X	Mainline	X	Access/Interchange
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Freight travel times will be measured using average mainline speed by time of day as previously described, with the rationale being that improvement in general congestion levels will also benefit freight movements.

Within access/interchange areas, route changes (in distance and time) for key freight generators along the corridor will be evaluated to determine travel times. Increases or decreases to freight trips due to access/interchange modifications will be documented for each alternative. These measures will be applied at the SDD and Tier 1 EIS Phases.

### Travel Time Reliability

#### Variability of Travel Time (HCM Methodology)

X	SDD	X	Tier 1 EIS	X	Mainline	X	Access/Interchange
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Reliability is a measure of how predictable the travel time is on a particular facility. The estimated change in travel time reliability for each alternative will be calculated using the HCM planning method and forecasted traffic volumes from the ABM. Travel time reliability will be reported separately for managed lanes and general purpose lanes where applicable. This methodology captures the congestion as well as the effects of weather, crashes and other incidents on the travel time on the facility. This measure will be applied at the SDD and Tier 1 EIS Phases.

### Connectivity

#### Intersection Density

X	SDD	X	Tier 1 EIS	X	Mainline	X	Access/Interchange
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The number of access points added or removed from I-94 will be identified for each alternative and compared to the No Build alternative. The intersection density (number of access points per mile) will be calculated. Intersection density for each alternative will be compared to freeway spacing guidelines. Alternatives that are consistent with guidelines in an urbanized area will be viewed more favorably than those that are not. This measure will be applied at the SDD and Tier 1 EIS phases.

#### Access to Land Use

X	SDD	X	Tier 1 EIS	X	Mainline	X	Access/Interchange
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Each alternative will be evaluated for its ability to provide access to nearby land uses. Where access is modified from the No Build condition, a qualitative analysis will be performed to document how the change in access alters travel patterns for the surrounding area. For example, removal of an interchange ramp could increase the travel distance required to get on or off I-94. However, if only the interchange ramp was removed and the crossing over I-94 remained, connectivity across the freeway would not be limited but could actually improve. Changes in access to local roadways and/or properties will also be

evaluated to document impacts to travel patterns beyond the freeway. This measure will be applied at the SDD and Tier 1 EIS Phases.

### Transit Mobility

#### Transit Travel Times in the Corridor

X	SDD	X	Tier 1 EIS	X	Mainline	X	Access/Interchange
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Transit travel times based on speed (miles/hour) will be calculated for each mainline alternative using estimated speeds for the lanes that transit will use in a particular alternative. In alternatives that have transit advantages such as HOV/HOT lanes and bus shoulders, transit speed will be estimated separately from general vehicle speed. This measure will be applied at the SDD and Tier 1 EIS Phases.

#### Transit Travel Times in Interchange Area

X	SDD	X	Tier 1 EIS		Mainline	X	Access/Interchange
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Transit travel times based on speed (miles/hour) will be calculated for each access/interchange alternative using estimated speeds for the lanes that transit will use in a particular alternative. In alternatives that have transit advantages such as HOV/HOT lanes and bus shoulders, transit speed will be estimated separately from general vehicle speed. This measure will be applied at the SDD and Tier 1 EIS Phases.

### Transit Reliability

#### Variability in Transit Travel Times

X	SDD	X	Tier 1 EIS	X	Mainline	X	Access/Interchange
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Transit reliability will be measured using variability of transit travel time the same way travel time reliability is measured except that it will just be applied to the facility or lanes that transit will use. This measures transit travel time predictability and the expected on-time performance for each alternative. This measure will be applied at the SDD and Tier 1 EIS Phases.

## Social, Economic and Environmental (SEE) Impacts

### Environmental Justice (EJ)

#### Potential for Disproportionately High and Adverse Effects on EJ Populations

X	SDD	X	Tier 1 EIS	X	Mainline	X	Access/Interchange
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Each alternative will be evaluated to determine whether it has the potential to result in disproportionately high and adverse effects on environmental justice populations. An assessment will be performed to evaluate how changes in access to I-94 or the local roadway system impact mobility for EJ populations.

**Access to economic opportunities and other daily needs for EJ populations:** This assessment will consider whether the changes in access potentially improve or reduce the ability to travel to places of employment, community centers, hospitals, grocery stores, schools, and other key destinations. The analysis will then consider whether this change has disproportionately high and adverse effects on EJ populations. This measure will be applied at the SDD and Tier 1 EIS Phases.

**Exposure to water and noise pollution for EJ populations:** An additional analysis will be performed to evaluate how alternatives may potentially impact exposure to water and noise pollution for EJ populations. The results of the SEE impact measurements described below related to water and noise will be compared to the location of EJ populations to determine whether there is a disproportionately high and adverse effect on these populations. This measure will be applied at the SDD and Tier 1 EIS Phases.

**Displacement potential for EJ populations:** The displacement potential for EJ populations will also be evaluated. If an alternative is expected to result in the removal of existing residential or business buildings, this will be documented from the right of ways impacts analysis. The resulting potential for loss in places of residence or jobs for EJ populations will be determined and documented for each alternative. This measure will be applied at the SDD and Tier 1 EIS Phases.

**Historic/Archaeological/Cemetery**

X	SDD	X	Tier 1 EIS	X	Mainline	X	Access/Interchange
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Potential to Affect Known Historic Properties

A qualitative assessment will be performed at the SDD and Tier 1 EIS Phases to determine if there is a Low, Moderate, or High potential for adverse effect to known historic properties. The number of known historic properties will also be noted in the Tier 1 EIS based on refinement of the project footprint as the level of design detail is advanced.

Potential Impact to Known or Suspected Cemeteries

A qualitative assessment will be performed at the SDD and Tier 1 EIS Phases to determine if there is a Low, Moderate, or High potential for adverse effect to known or suspected cemeteries. The number of known or suspected cemeteries will also be noted in the Tier 1 EIS based on refinement of the project footprint as the level of design detail is advanced.

**Section 4(f)**

Potential Impact to Resource

X	SDD	X	Tier 1 EIS	X	Mainline	X	Access/Interchange
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Each alternative footprint will be screened for potential impacts on use to Section 4(f) resources related to parklands or recreation areas. Section 4(f) impacts will be quantified by the total number of potential Section 4(f) resources impacted in the SDD Phase. In the Tier 1 EIS phase, a preliminary Section 4(f) evaluation will be completed to assess adversely affected Section 4(f) resources within an alternative’s footprint. Adverse effects will be defined as impacts to the recreational use. Of note, potential Section 4(f) impacts on historic properties will be evaluated by the Historic/Archaeological/Cemetery measures described above.

**Section 6(f)**

Potential Impact to Resource

X	SDD	X	Tier 1 EIS	X	Mainline	X	Access/Interchange
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Each alternative footprint will be screened for potential conversion of Section 6(f) resources, or natural resources that have received Land and Water Conversation Funds (LAWCON). Section 6(f) impacts will

be quantified by the total number of Section 6(f) resources potentially impacted in the SDD Phase. In the Tier 1 EIS Phase, a preliminary Section 6(f) evaluation will be completed to assess adversely affected Section 6(f) resources within an alternative’s footprint. Adverse effects will be defined as impacts to the recreational use.

### Contaminated Properties

#### Impact to Sites with Potential for Hazardous Materials

X	SDD	X	Tier 1 EIS	X	Mainline	X	Access/Interchange
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Contaminated sites can present liability and cost risks for each alternative footprint based on the potential for hazardous materials. Contaminated sites will be evaluated by the total number of known contaminated sites impacted. For the scoping phase, the level of detail will be based upon a desktop review of contaminated sites within 1/4 mile of I-94 using the “What’s In My Neighborhood” database from the Minnesota Pollution Control Agency and Minnesota Department of Agriculture. In the Tier 1 EIS phase, areas up to 500 feet from each alternative footprint will be evaluated to identify contaminated sites based upon a document research review performed by the MnDOT Contaminated Materials Management Team.

### Right of Way

#### Adjacent Property Impacts

X	SDD	X	Tier 1 EIS	X	Mainline	X	Access/Interchange
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Right of way (ROW) needs can contribute to project costs and risk to the project delivery schedule. Quantifying ROW impacts can serve as an indicator of physical impact and cost. ROW will be measured by counting the acreage and anticipated number of property relocations. This evaluation will occur for each mainline and access/interchange alternative footprint at the SDD and Tier 1 EIS Phases.

### Noise

#### Potential Impact to Public Health and Welfare from Traffic Related Noise Pollution

X	SDD	X	Tier 1 EIS	X	Mainline	X	Access/Interchange
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Noise impacts will be evaluated to protect public health and welfare from traffic related noise pollution. At the SDD Phase, a qualitative assessment will be performed to determine whether the alternative will cause a material change in horizontal or vertical alignment or add travel lanes. These factors determine whether a project is considered a “Type 1” project for the purposes of determining whether a noise analysis is required.

To perform the analysis at the Tier 1 EIS Phase, the corridor will be divided into segments and select representative noise receptor locations will be identified. The FHWA Traffic Noise Model (TNM) will be used to model the representative receptor locations and provide a general understanding for potential noise impacts associated with each alternative. A high-level analysis for consideration of noise abatement measures and cost effectiveness will be performed on potentially impacted areas to determine if those impacts can be minimized.

## Water Pollution/Stormwater

### Impervious Surface Area

X	<b>SDD</b>	X	<b>Tier 1 EIS</b>	X	<b>Mainline</b>	X	<b>Access/Interchange</b>
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Alternatives will be assessed based on whether it protects streams and lakes from degradation of water quality due to post-construction runoff. A common proxy measure for stormwater runoff is the amount of impervious surface. Generally, the more impervious surface there is, the more runoff there is and the more mitigation that is required. The total acreage of additional impervious surface area will be calculated to assess stormwater impacts. Considerations to how alternatives provide stormwater treatment and address current stormwater regulations will be documented. Alternatives will be compared against the No-Build alternative. The analysis will be prepared using NOAA Atlas 14 Precipitation Frequency Estimates modeling. This is a high-level assessment that will be provided at the SDD and Tier 1 EIS Phases.

## Air Quality

### Potential Impact to Resource

X	<b>SDD</b>	X	<b>Tier 1 EIS</b>	X	<b>Mainline</b>	X	<b>Access/Interchange</b>
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At the SDD Phase, a yes/no screening will be performed to determine if the alternative could be considered regionally significant for air quality concerns or will have a meaningful impact on traffic volumes or vehicle mix. Air quality impacts must be addressed as part of the NEPA process to protect health and welfare by attaining and maintaining the National Ambient Air Quality Standards (NAAQS). Each alternative will have an estimated impact and will be compared to the No Build alternative at the Tier 1 EIS Phase based on its estimated air quality impact. A yes/no threshold will be used to rate the alternative. Alternatives that enable the region to maintain compliance with the NAAQS will be ranked as "yes."

## Threatened and Endangered Species

### Potential Impact to Threatened and Endangered Species

X	<b>SDD</b>	X	<b>Tier 1 EIS</b>	X	<b>Mainline</b>	X	<b>Access/Interchange</b>
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At the SDD Phase, a qualitative assessment will be performed to determine if the alternative has the potential to impact threatened and endangered species (yes/no). At the Tier 1 EIS Phase, each alternative will be evaluated based on relative threatened and endangered species impacts as well as mitigation efforts when possible. Each alternative footprint will have an estimated species impact and will be ranked against the No Build alternative based on their estimated impacts. A three-tiered scale will be used to assign a score to the alternative as "low," "medium," or "high" impacts to threatened and endangered species. The potential Endangered Species Act Section 7 effect determination will be used to assist in ranking alternatives. Alternatives with "low" impacts to threatened and endangered species will be ranked favorably. It is anticipated that a "no effect" and "no adverse effect" would be considered "low." A "may adversely affect" would be considered "medium," and "adversely affect" would be considered "high."



## Wetlands

### Potential Impact to Resource

X	SDD	X	Tier 1 EIS	X	Mainline	X	Access/Interchange
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Each alternative footprint will be screened to determine potential impacts to wetland resources. At the SDD Phase, a yes/no determination will be made to determine if the alternative has the potential to impact wetlands, along with the number impacted based on National Wetland Inventory (NWI) data. Wetland impacts will be quantified by the potential total acreage of wetland resources impacted by wetland type at the Tier 1 EIS Phase based on a more refined project footprint in the advanced design.

## Floodplain

### Potential Impact to Resource

	SDD	X	Tier 1 EIS	X	Mainline	X	Access/Interchange
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Each alternative footprint will be screened to determine potential impacts to floodplain resources. Floodplain impacts will be identified by the encroachment type (transverse or longitudinal) and quantified by the total acreage of potential floodplain resources impacted in the Tier 1 EIS Phase based on a more refined project footprint in the advanced design.

## Flooding

### Potential to Increase Flood Conditions

	SDD	X	Tier 1 EIS	X	Mainline	X	Access/Interchange
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Each alternative footprint will be screened to determine the potential for increased flooding events. Current flood-prone locations and potential flooding locations based on NOAA Atlas 14 modeling will be determined for each alternative to consider whether flooding potential would increase or decrease with a given alternative. Locations with increased flooding potential for a given alternative will be documented by the number of locations and total acreage in the Tier 1 EIS Phase.

## Visual Impacts

### Potential Impact to Existing Visual Resources and Potential Viewers

	SDD	X	Tier 1 EIS	X	Mainline	X	Access/Interchange
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**Degree of Impact to Visual Resources:** At the Tier 1 EIS Phase, each alternative will be evaluated to determine the potential degree of impact to visual resources based on MnDOT’s Visual Impact Assessment (VIA) process, which follows the FHWA four-step process. These impacts will be identified as beneficial, neutral, or adverse. Impact classifications are based on the potential for minor or major changes to the visual resources of the natural, cultural, or project environments.

**Degree of Impact to Viewers:** At the Tier 1 EIS Phase, each alternative will be evaluated to determine the degree of impact to viewers based on MnDOT’s VIA process, which follows the FHWA four-step process. These impacts will be identified as beneficial, neutral, or adverse. Impact classifications are based on the potential for localized or widespread changes in the ability of neighbors or travelers to see the visual resources of the natural, cultural, or project environments.

## Community Cohesion

### Potential Impact to Community Cohesion

	<b>SDD</b>	X	<b>Tier 1 EIS</b>	X	<b>Mainline</b>	X	<b>Access/Interchange</b>
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At the Tier 1 EIS Phase, a qualitative assessment will be performed to determine whether the alternative impacts community cohesion by creating physical barriers, increasing travel times, disrupting access to care facilities, or decreasing access to congregational centers. A descriptor of “low,” “medium,” or “high” will be assigned to describe the potential level of impact.

Note: Community cohesion can also be affected by perception of increased risk to physical injury and increased noise levels; therefore, community cohesion is also addressed through the following project need and SEE impact measures:

- **Tier 1 EIS – Walkability/Bikeability:** Multimodal Level of Service [Oregon method]; **Safety:** Crashes and Crash Rate Reduction, Crash Cost Reduction; **Noise:** Representative Traffic Noise Model Analysis

## Goals & Livability

### Sense of Place

#### Opportunities for Gathering Spaces, Cultural and Historic Representation and Art, and Green Spaces

X	<b>SDD</b>	X	<b>Tier 1 EIS</b>	X	<b>Mainline</b>	X	<b>Access/Interchange</b>
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This measure will evaluate how alternatives address Sense of Place by providing opportunities to create features or amenities in partnership with communities to enhance sense of place. Possible features or amenities include gathering spaces, cultural and historic representation and art, and green spaces. Since these features or amenities are often led by the local agencies and community groups, a qualitative assessment with input from these groups will be performed to help identify whether a given alternative does provide available space or opportunities to address community goals for enhancing sense of place. At the SDD Phase, alternatives will be evaluated using a yes/no response. At the Tier 1 EIS Phase, alternatives will be evaluated using a three-tiered scale of “low,” “medium” or “high.” Alternatives with a “high” opportunity for enhancing sense of place will be ranked favorably. A qualitative assessment using spatial analysis will also be performed to evaluate whether the opportunities for features or amenities are equitably distributed throughout the corridor.

### Equity

#### Distribution of Transportation Resources Across Communities

X	<b>SDD</b>	X	<b>Tier 1 EIS</b>	X	<b>Mainline</b>	X	<b>Access/Interchange</b>
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Transportation equity considers access to affordable and reliable transportation to meet the needs of all community members, particularly traditionally underserved populations. Increasing transportation choices for individuals provides more freedom in transportation decisions, decreases household transportation costs, and promotes public health. With the availability of high-frequency transit, bus routes, sidewalks, and bikeways within the study area, increasing transportation choices supports

transportation equity. At the SDD Phase, a qualitative assessment will be performed to evaluate whether each alternative has the potential to enhance transportation choices for individuals (yes/no). Alternatives that enhance transportation choices may support multiple travel modes, create features that enhance connections between modes, expand transit and non-motorized facilities, or create anticipated benefits to transit service reliability. At the Tier 1 EIS, alternatives will be evaluated using a three-tiered scale of “low,” “medium” or “high” based on whether they facilitate or do not eliminate opportunities to enhance transportation choices. Alternatives with a “high” benefit to transportation choice will be ranked favorably. A qualitative equity assessment using spatial analysis will also be performed to evaluate whether enhanced transportation choices are available throughout the corridor. Locations that will experience an increase in transit opportunities will be documented. Similar equity analyses have also been incorporated into the proposed measures for other Livability pillars to better understand the equity implications of each alternative.

Note: Equity for EJ populations is also addressed through the following SEE impact measures:

- **SDD** – Environmental Justice: Access to economic opportunities and other daily needs for EJ populations)
- **Tier 1 EIS** – Environmental Justice: Access to economic opportunities and other daily needs for EJ populations

### Economic Vitality

Opportunities for Job and Business Accessibility, Real Estate Development, Revenue, Housing Opportunity and Affordability

X	<b>SDD</b>	X	<b>Tier 1 EIS</b>	X	<b>Mainline</b>	X	<b>Access/Interchange</b>
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The Economic Vitality pillar recognizes opportunities for job and business accessibility. Transportation can play a role in supporting economic vitality for individuals, businesses, and communities by providing reliable and timely access to employment centers and job opportunities. Job accessibility is a measure that can be used to evaluate how each alternative supports connecting individuals to a diverse range of employment opportunities. At the SDD Phase, the number of jobs within a 30-minute travelshed will be estimated for each alternative based on the travel time savings for vehicles and transit calculated in the Mobility criteria. At the Tier 1 EIS Phase, job accessibility for each alternative will be estimated based on the percent change from the No Build condition for how many more jobs individuals can access based on the change in travel times.

Note: Economic Vitality is also addressed through the following project need measures:

- **SDD** – Mobility: Access to land use [Qualitative Assessment], Freight Travel Times
- **Tier 1 EIS** – Mobility: Access to land use [Qualitative Assessment], Freight Travel Times

### Public Health and the Environment

Opportunities to Improve Quality of Life, Comfortable Environment, and Well-being Through Green Spaces and Land Use

X	<b>SDD</b>	X	<b>Tier 1 EIS</b>	X	<b>Mainline</b>	X	<b>Access/Interchange</b>
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The Public Health and the Environment pillar emphasizes opportunities to improve quality of life, a comfortable environment, and well-being through green spaces and land use. Since transportation options are one of many variables that determine quality of life and a comfortable environment, each alternative will be evaluated for how it supports green spaces or land uses that potentially benefit quality of life and the environment. Considerations will include the opportunity to complement or increase green space along or adjacent to the I-94 corridor and how access modifications may support development opportunities. Usable green space for public or environmental purposes will be identified and favored over small linear segments that provide minimal benefit or opportunity for use. For example, an alternative that provides additional greenspace adjacent to a park (regardless of whether it is considered parkland or right of way) would be favored over an alternative that provides unusable greenspace. At the SDD Phase, a yes/no response will be provided to indicate whether an alternative has the potential to impact green space or land uses that benefit quality of life and the environment. At the Tier 1 EIS Phase, the amount of new green spaces or land use that benefit quality of life and the environment will be calculated for each alternative, measured in acreage. A qualitative equity assessment using spatial analysis will also be performed to evaluate whether these enhancements are available throughout the corridor.

Note: Public Health and the Environment is also addressed by measures that potentially improve quality of life and could provide a comfortable environment through the following project need and SEE impact measures:

- **SDD** – Walkability/Bikeability: Distance between Crossings, Travel Time between Origin-Destination Pairs; Water Pollution/Stormwater: Impervious Surface Area [Acreage]
- **Tier 1 EIS** – Walkability/Bikeability: Multimodal Level of Service [Oregon method], Distance between Crossings, Travel Time between Origin-Destination Pairs; Water Pollution/Stormwater: Impervious Surface Area [Acreage]

## Connectivity

Opportunities to Use Infrastructure to Connect Communities Physically and Socially

X	<b>SDD</b>	X	<b>Tier 1 EIS</b>	X	<b>Mainline</b>	X	<b>Access/Interchange</b>
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Previous mobility and walkability/bikeability measures consider network connectivity, quality, and condition for all modes of travel (walking, biking, vehicles, freight, and transit). The Connectivity pillar focuses on opportunities to use infrastructure to connect communities physically and socially. As the cities and counties have an extensive planned walking and biking network identified in their long-range plans, this measure will be used to evaluate how alternatives implement these planned networks to enhance community connections or enable/support their construction by the local agency. At the SDD Phase, each alternative will be reviewed to determine whether it facilitates or does not eliminate opportunities to implement planned non-motorized facilities (yes/no). At the Tier 1 EIS Phase, the percent of planned facility-miles for new bikeways and sidewalks that would be implemented as part of each alternative will be calculated.

Note: Connectivity is also addressed through the following project need and SEE Impact measures:

- **SDD** – Walkability/Bikeability: Distance between Crossings, Travel Time between Origin-Destination Pairs; Mobility: Intersection density, Access to land use [Qualitative Assessment]
- **Tier 1 EIS** – Walkability/Bikeability: Multimodal Level of Service [Oregon method], Distance between Crossings, Travel Time between Origin-Destination Pairs; Mobility: Intersection density, Access to land use [Qualitative Assessment]; Community Cohesion: does the alternative facilitate or eliminate an opportunity for connections? [Qualitative Assessment]

**Safety (Measured in Other Categories)**

Separate evaluation criteria were not developed for the Safety pillar. The performance of each alternative regarding safety will be addressed as part of the project need categories outlined below.

**Network Crashes (Measured in Needs - Safety category)**

- **SDD** – Safety: Alternative addresses the number and severity of crashes along the corridor (Yes/No) [Qualitative Assessment], Crash modification factors (CMF) and Highway Safety Manual
- **Tier 1 EIS** – Safety: Crashes and Crash Rate Reduction, Crash Cost Reduction

**Safety on Intersecting Streets - Network Crashes (Measured in Needs - Safety category)**

- **Tier 1 EIS** – Safety: Crashes and Crash Rate Reduction, Crash Cost Reduction

**Non-Motorized Connectivity and Performance (Measured in Needs - Walkability/Bikeability category)**

- **Tier 1 EIS** – Walkability/Bikeability: Multimodal Level of Service [Oregon method]

**Additional Considerations: Cost**

**Estimated Construction Cost**

X	<b>SDD</b>	X	<b>Tier 1 EIS</b>	X	<b>Mainline</b>	X	<b>Access/Interchange</b>
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Estimated construction costs for each alternative will be developed assuming MnDOT design standards and using current length, width, depth (LWD) cost factors combined with a risk register. Estimates will include costs associated with pavement, bridge, walls, lighting, and sign structures, and will be provided as a cost range at the SDD phase. A risk register will be established and maintained to develop risk-based cost range estimates for each mainline and access/interchange alternative at the Tier 1 EIS phase.

**Estimated Benefit-Cost**

	<b>SDD</b>	X	<b>Tier 1 EIS</b>	X	<b>Mainline</b>	X	<b>Access/Interchange</b>
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At the Tier 1 EIS Phase, a benefit-cost analysis will be applied to the mainline and access/interchange alternatives. A high-level benefit-cost analysis procedure appropriate for the level of design, traffic, safety, and other information available at the Tier 1 EIS Phase will be followed to determine net benefits for the proposed alternatives and generate the benefit-cost ratio (in dollars).

**Additional Considerations: Maintenance**

**Estimated Maintenance Cost**

X	<b>SDD</b>	X	<b>Tier 1 EIS</b>	X	<b>Mainline</b>	X	<b>Access/Interchange</b>
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Maintenance considerations for each alternative will be developed to evaluate relative ability to maintain a facility by quantifying the increase in infrastructure and ease of maintaining facilities for activities related to striping and snow removal. This is a high-level assessment that will be provided for each alternative footprint as a cost range at the SDD phase and as a risk-based cost range at the Tier 1 EIS Phase.

## Additional Considerations: Consistency with Adopted State and Regional Plans

### Consistency with Adopted State and Regional Plans

X	SDD	X	Tier 1 EIS	X	Mainline	X	Access/Interchange
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Each mainline and access/interchange alternative will be assessed to determine whether the alternative is consistent with adopted state and regional plans identified in the Purpose and Need statement. This qualitative analysis will be performed at the SDD and Tier 1 EIS Phases. Four plans will be included in this assessment:

- MnDOT’s 20-Year State Highway Investment Plan (MnSHIP)
- MnDOT’s Metro District Bicycle Plan (MBP)
- MnDOT’s Statewide Pedestrian System Plan
- Metropolitan Council’s 2040 Transportation Policy Plan (TPP), or most recent adopted version at the time of the evaluation