Project and Analyst Information:

Analyst:		Design ID:	
Agency:		Construction ID:	
Date:		Highway:	
		County	
		Municipality	
		Project Title:	
		Project Subtitle:	
		Scheduled Construction Year:	
		Improvement Concept Code:	

Background Information:

Define project scope, study limits, and describe the need for the operational component of the project. Note if operational improvements are related to an existing corridor study. Describe any public or political input related to the safety and operations of the area.

Exhibits:

- *Consider including highway labels, key street labels, lane configurations, turn bay lengths, graphic scale, and north arrow on the Project Location/Overview Map.*

Existing Conditions

Provide information that will help the document reviewer understand the study area, importance, and need for improvements. Below is a list of topics to consider. Duplicate table if more than one site was evaluated.

Existing Conditions:	Operational Site of Promise:
Existing Freight Routes:	☐ OSOW-TR ☐ High Clearance ☐ Wind Tower ☐ Long Truck Route ☐ 65' Restricted Truck Route ☐ N/A
Existing Accommodations:	☐ Pedestrian ☐ Bicycle ☐ Railroad ☐ Transit ☐ N/A ☐ Other: *indicate the type of facility* *Discuss any concerns/potential impacts to alternate modes of transportation.*
Traffic Generators:	☐ Seasonal Event ☐ Daily Event ☐ Special Event ☐ Major Traffic Generator (shopping center, gas station, school, etc.) ☐ N/A *If present, please describe the location of the traffic generator to the study location and the type of event or location that generates traffic.*
Do Alternate Routes Exist?	☐ Yes ☐ No *If yes, describe the alternate route(s):*

Operational Analysis:

Traffic Volumes

Discuss any pertinent information about the existing traffic volumes collected or future traffic forecasts. Planning-level traffic forecasts are acceptable for the purpose of this operational analysis. If other scenarios or years were evaluated, provide a description and explanation.

Traffic forecasts are needed for the operational analysis start year and end year.

- *The operational analysis start year is the first year the roadway is open to traffic after construction (i.e., the analysis period begins the year after completing construction of the improvement)*

- *The operational analysis end year is determined by adding the fixed service life of the project's improvement concept to the start year. For consistency, the OCP shall use the following prescribed service life durations:*
  - *Resurface - 10 years*
  - *Pavement Replacement using new asphalt - 15 years*
  - *Pavement Replacement using new concrete - 20 years*

Fill out the table below to identify what traffic volume information is available for each site. Duplicate table if more than one site was evaluated.

Operational Site of Promise:	
Annual Growth Rate:	
Existing Counts:	Turning Movement Count (*Indicate count year*): ☐ Yes ☐ No ☐ N/A Duration: *Indicate count duration, such as AM/PM peak, 13 hours, etc.* Mainline Count (*Indicate count year*): ☐ Yes ☐ No ☐ N/A
Forecast Scenarios:	Start Year (*Indicate start year*): ☐ Yes ☐ No End Year (*Indicate end year*): ☐ Yes ☐ No Other Scenario/Year (*Indicate any other scenario/year*): ☐ Yes ☐ No
NPMRDS Data:	☐ Yes ☐ No ☐ N/A *NPMRDS data is only used in the mainline operational evaluation. Check the N/A box if the site is an intersection.*

Attachments/Exhibits:

- *Turning movement counts (Intersection Traffic Volume Report) (if applicable)*
- *Diagram of traffic volumes for each analysis period: show volumes by direction at each study intersection/corridor. Diagrams from turning movement counts or traffic forecasts may suffice.*

Intersection Control

Fill out the table below for each intersection evaluated. Duplicate table if more than one intersection was evaluated.

Intersection:	☐ N/A
Existing Control Type:	☐ Signalized ☐ TWSC ☐ AWSC ☐ Roundabout ☐ Other: *If other, indicate the control type* *If signalized, indicate if signal is part of coordinated system and/or when the most recent signal timing update was made.*
Warrant Analysis	AWSC Warrants: ☐ Yes ☐ No Signal Warrants: ☐ Yes ☐ No *Indicate if any existing or future warrant analyses has been completed*
Optimized Signal Timing Evaluated?	☐ Yes ☐ No ☐ N/A *Was an evaluation completed to see if the signal timing could be optimized to decrease the delay and queueing on the State Trunk Network (STN) approaches?* Results: *What were the results of the signal timing optimizations? What changes were made, how did they address the issues on the STN, and how did they impact the minor approach(es)?*

Attachments:

- *AWSC warrants (if applicable)*
- *Signal warrants (if applicable)*

Operational Evaluation and Results

Fill out the table below for each site's operational evaluation. Combine multiple sites into one table if the same analysis software, analysis periods, and scenarios are used. List each applicable site or indicate all sites in the first row. Duplicate table as necessary.

Operational Site of Promise:	
Software used for operational analysis	
Version of software	
Analysis periods	☐ AM Peak ☐ Mid-Day Peak ☐ PM Peak ☐ Weekend ☐ Other: *Describe analysis period*
Scenarios Evaluated	☐ No-Build (Start Year) ☐ No-Build (End Year) ☐ Build (Start Year) ☐ Build (End Year) ☐ Other: *Describe analysis period*
Software Limitations	*Identify and document any concerns with respect to operational analysis (e.g. software limitations, assumptions, reliability of data input and/or output, etc.) and corrective action.*

Input results in the operational analysis summary tables below for each scenario and analysis period evaluated. The typical scenarios (start year and end year) and analysis periods (AM and PM) have been populated in the tables. If different scenarios or analysis periods are evaluated, modify the tables as necessary. If more than one alternative was evaluated, include results for each alternative. Separate tables are provided for intersection and mainline results. Duplicate or delete tables and rows/columns as necessary.

Intersection LOS by Movement and Approach														
Intersection:														
Scenario	Analysis Period	Roadway:												
		Direction:												
		Movement	L	T	R	L	T	R	L	T	R	L	T	R
No-Build														
Start Year (*indicate start year*)	AM	LOS												
		LOS by approach												
	PM	LOS												
		LOS by approach												
End Year (*indicate end year*)	AM	LOS												
		LOS by approach												
	PM	LOS												
		LOS by approach												
Build – Alternative 1 (*Provide a brief description of the alternative, such as signal, add right turn lane, etc.*)														
Start Year (*indicate start year*)	AM	LOS												
		LOS by approach												
	PM	LOS												
		LOS by approach												
End Year (*indicate end year*)	AM	LOS												
		LOS by approach												
	PM	LOS												
		LOS by approach												

Mainline LOS by Direction										
Mainline:										
Segment	Direction	No-Build				Build Alternative 1 (*Provide a brief description of the alternative, such as add aux lane, extend decel lane, etc.*)				
		Start Year (*indicate start year*)		End Year (*indicate end year*)		Start Year (*indicate start year*)		End Year (*indicate end year*)		
		AM	PM	AM	PM	AM	PM	AM	PM	

Attachments/Exhibits:

- *Software reports for operational analysis*
- *DT 1887*

Queue Analysis

Based on field data and the 95th-percentile back-of-queue length, assess whether the existing and no-build queues block access to any critical locations. Include a table for each site evaluated.

Operational Site of Promise:		
Are there existing/no-build queuing issues? ☐ Yes ☐ No *If no, then continue to the next section*		
Existing/No-Build Queuing Issues		Intersection/Mainline Approach
Queues block access to:	☐ Left turn lane ---------- ☐ Right turn lane ---------- ☐ Driveways---------- ☐ Adjacent Intersection---------- ☐ Railroad Crossing---------- ☐ On/off-ramp ---------- ☐ Other Critical Location ---------- *If other, indicate what is blocked by queues.*	☐E/NE; ☐ W/SW; ☐ N/NW; ☐ S/SE ☐E/NE; ☐ W/SW; ☐ N/NW; ☐ S/SE ☐E/NE; ☐ W/SW; ☐ N/NW; ☐ S/SE ☐E/NE; ☐ W/SW; ☐ N/NW; ☐ S/SE ☐E/NE; ☐ W/SW; ☐ N/NW; ☐ S/SE ☐E/NE; ☐ W/SW; ☐ N/NW; ☐ S/SE ☐E/NE; ☐ W/SW; ☐ N/NW; ☐ S/SE
Are there any access control issues?	☐ Yes ☐ No *Please provide a description of each access location and an explanation of the issue.*	☐E/NE; ☐ W/SW; ☐ N/NW; ☐ S/SE

Discuss the existing and no-build scenario queuing results, how it relates to available storage, and the blocked access for each scenario. In the case of an interchange, indicate how far the queue backs up on to the ramp. Note how the queuing affects the design (e.g., turn bay lengths). Discuss how the build scenario addresses the queuing issues.

Attachments/Exhibits:

- *Exhibit highlighting queues vs. available storage for each analysis period. Provide exhibits for the existing, no-build, and build scenarios. Include a screenshot of the location and visually show estimated queue lengths, available storage, and locations with blocked access.*

Economic Appraisal:

Complete the benefit-cost analysis using the Intersection Benefit-Cost Tool or Mainline Facility Benefit-Cost Tool. Input pass/fail results of the safety and operational checks for each site and each alternative into the table. If any of the Fail boxes are checked, discuss why the improvement(s) should be considered.

Operational Site of Promise				
Alternative				
Safety B/C ratio check	☐ Pass ☐ Fail	☐ Pass ☐ Fail	☐ Pass ☐ Fail	☐ Pass ☐ Fail
Fatal and injury crash check	☐ Pass ☐ Fail	☐ Pass ☐ Fail	☐ Pass ☐ Fail	☐ Pass ☐ Fail
Safety and operations B/C ratio check	☐ Pass ☐ Fail	☐ Pass ☐ Fail	☐ Pass ☐ Fail	☐ Pass ☐ Fail
STN-only B/C ratio check (intersections only)	☐ Pass ☐ Fail ☐ N/A	☐ Pass ☐ Fail ☐ N/A	☐ Pass ☐ Fail ☐ N/A	☐ Pass ☐ Fail ☐ N/A

Attachments:

- *All printouts from the Intersection Benefit-Cost Tool and/or Mainline Facility Benefit-Cost Tool*

Summary of Findings:

Summarize the findings of the operational analysis and economic appraisal for each alternative evaluated. Include discussion on how each improvement correlates to the operational issue (e.g., Proposed improvement X will mitigate operational problem Y by Z). Clearly highlight the benefit to the State Trunk Network. Do not recommend an alternative if more than one alternative was evaluated. The preferred alternative will be identified in the environmental document.

Attachments/Exhibits:

- *Alternative Layout/Schematic should include aerial, dimensions, lane configurations, turn bay lengths, and any other unique geometric components*

Attachments:

Include all attachments in the final Operations Certification Summary. Provide a list of all the attachments/exhibits. A base list is provided and should be updated to reflect the actual attachments/exhibits provided with the submittal. Attach the final Operations Certification Summary to the Safety & Operations Certification Document and submit as a single PDF.

A. Operational Analysis
    a. Turning Movement Counts (Intersection Traffic Volume Report)
    b. Diagram of traffic volumes for each analysis period
    c. AWSC warrants
    d. Signal warrants
    e. Software reports for operational analysis
    f. DT 1887
    g. Exhibit highlighting queues vs. available storage for each analysis period
B. Economic Appraisal
    a. All printouts from the Intersection Benefit-Cost Tool and/or Mainline Facility Benefit-Cost Tool