Exhibit A - Scope of Work

Freeway System Interchange Study

Objective

The State, in cooperation with the Metropolitan Council (Met Council), is requesting proposals to evaluate interchanges between State’s system of freeways within the Minneapolis-St. Paul urbanized area. The study will analyze at a planning-level the performance of these interchanges, and develop and prioritize investments based on the extent of deficiencies and cost effectiveness of proposed design solutions. It is expected that this study will last approximately 12 to 18 months and its recommendations will be incorporated into future State and Met Council investment plans.

The study will:
- Analyze the performance of the system interchanges (defined for the purposes of this study as between at least two freeways) in the Twin Cities Metropolitan Area (approximately 52) utilizing measures of user delay, reliability, crashes, transit usage and freight specific prioritization (Regional Truck Freight Corridors, delay, reliability, crashes and Heavy Commercial Annual Average Daily Traffic [HCAADT]) by approach leg
- Screen out interchanges with the fewest present day operational deficiencies (Task 2) of the study to allow for more detailed analysis of a smaller subset of system interchanges with more significant operational deficiencies (Task 3) (approximately 10)
- Determine the root causes of deficiencies, such as weaving sections, merging, geometric, ramp or through capacity, heavy vehicle acceleration, etc. by approach leg
- Develop and analyze planning-level costs and benefits of potential solutions with an emphasis on those that address the worst performance aspects of the interchange in the most economical manner
- Consider opportunities to address issues as part of future projects currently identified in the State Transportation Improvement Plan (STIP), Capital Highway Investment Plan (CHIP) and Transportation Development Guide/Policy Plan (Metropolitan Council, 1996) (TPP), where solutions can be implemented in phases and potential barriers to implementation
- Prioritize improvements based on the analysis of benefits and costs, and implementation opportunities and barriers

State and the Met Council will co-lead this study with State maintaining the contract. Both State and Met Council will work together to ensure the study’s primary objectives are met.

Additional considerations that the study process will need to recognize and consider include:
- Produce and communicate an understandable interchange prioritization process
- Use the prioritization work to provide direction that helps State and the Met Council make funding decisions needed for various unique federal or state funding programs (e.g., Transportation Economic Development Program, Corridors of Commerce Program, Freight Solicitation, etc.)
- Identify project priorities for the Regional Mobility Improvements highway investment category noted in the Minnesota State Highway Investment Plan (MnSHIP) and the Strategic Capacity Enhancements investment category in Met Council’s 2040 Transportation Policy Plan
- Incorporate relevant results from other regional planning documents including Congestion Management Safety Plan 4, MnPASS Phase 3 System Study, Highway Truck Corridor Study, etc.
- Gather input from the Congestion Management Plan (CMP) Advisory Committee
Exhibit A - Scope of Work

Background
The Met Council and State Metro District desire to know which system interchanges have the most significant deficiencies and the greatest opportunities for improvement in terms of delay, reliability and crashes, and to develop a prioritized list of potential solutions for these interchanges within the Metro area. The goal is not to invest in complete interchange reconstruction projects, but rather to address specific problems that hinder the performance of the interchange.

In recent years State and the Met Council, working with other partners, have conducted a variety of planning activities that establish a policy framework that prioritizes investments for the Metro highway system. The following planning initiatives and studies, along with other relevant planning documents will be utilized to provide data and policy direction for the study:

- 20-Year Minnesota State Highway Investment Plan (2017)
- MnPASS Phase 3 System Study (2017)
- Congestion Management Safety Plan 4 Study (2017)
- Metropolitan Council Thrive MSP 2040 (2014)
- Metropolitan Council 2040 Transportation Policy Plan (2015)
- Metropolitan Council Highway Truck Corridor Study (2017)
- MnDOT Statewide Freight System Plan (2015)
- Metropolitan Freeway System Congestion Report (2016)

It is anticipated that this study’s analysis and prioritization will need to be updated periodically over time due to changing conditions and that the study results will be used to inform funding decisions. This study will focus on existing problems as opposed to forecasted problems but seek to reflect anticipated growth in the region and planned corridor improvements in the development of solutions.

Task 1 Project Management

Objective: Provide timely policy and technical direction to consultant on study process, results and recommendations.

Subtask 1.1 Meet with Project Management Team

State and Met Council will appoint a Project Management Team (PMT) to manage the project for the agencies. The Contractor will schedule meetings of the PMT approximately every four weeks on a staggered schedule from the Technical Advisory Committee meetings.

Contractor Deliverables:

- PMT meeting agendas and other meeting materials five working days prior to meeting (up to 24 meetings)
- Draft PMT meeting minutes (up to 24 meetings) within five working days following the meeting. Allow five working days for comments and then publish final meeting minutes. Distribute minutes to all members of the PMT.
- A Schedule (Gantt Chart) showing the proposed timeframes of each task and subtask.

Subtask 1.2: Meet with Technical Advisory Committee (TAC)

The TAC will consist of technical staff representing, but not limited to, the following stakeholders:
Exhibit A - Scope of Work

- Hennepin County
- Scott County
- Dakota County
- Anoka County
- Carver County
- Ramsey County
- Washington County
- Region 7W
- Federal Highway Administration
- Association of Metropolitan Cities
- Select PMT members
- MnDOT Metro and Metropolitan Council staff (in addition to the PMT members)

The TAC will provide technical direction to the PMT and the Contractor Team. State and Met Council will contact the agencies to obtain appropriate staff appointments. To involve the TAC, the Contractor will provide a schedule of meetings that conform to major milestones in the development of the study leading to the final report (up to one per month as necessary). Additional working group meetings and/or subgroup meetings may also be scheduled as needed. State and the Met Council will make meeting rooms available for the PMT and TAC.

Contractor Deliverables:

- TAC meeting agendas and other meeting materials five working days prior to meeting (up to 14 meetings)
- TAC meeting minutes (up to 14 meetings) within five working days following the meeting. Allow five working days for comments and then publish final meeting minutes. Distribute minutes to all members of the PMT.

Subtask 1.3 Plan for and Facilitate Agency Outreach

The Contractor will prepare materials for use in outreach to the Transportation Advisory Board (TAB), TAB’s TAC, TAC Funding and Programming, CMP Advisory Committee, Minnesota Freight Advisory Committee (MFAC), and State’s Capital Improvements Committee. State and Met Council will schedule presentations and notify groups of the time and place. The Contractor will prepare necessary materials and make presentations. State and Met Council staff will participate in presentations and, question and answer sessions. Some potential times for presentations may include:

- Start of project (discuss project schedule, methodology and major milestones)
- After first high-level screening proposes short list for solution development
- After design solutions for priority interchanges developed
- After proposed solutions evaluated and prioritized

Contractor Deliverables:

- Meeting materials and presentations (up to 18 meetings)
Task 2 Problem Assessment and Screening

Task Objective: Sort all freeway to freeway interchanges listed in Subtask 2.1 by current performance level (congestion and crashes) and greatest opportunities. Identify a limited number of interchanges with a natural break point, with the most significant mobility, reliability and safety problems, and considering planned asset preservation and other investments and opportunities for further study (approximately 10).

Subtask 2.1 Determine freeway to freeway interchanges to be studied

- The attached map of 52 interchanges, or as modified by TAC and PMT, are to be evaluated
- Document the currently planned bridge, pavement, MnPASS and other investments for each interchange and related through lanes

Contractor Deliverables:

- Map of interchange locations to be studied with associated table of relevant planned preservation investments for each location

Subtask 2.2 Provide recommended method to be used to evaluate and rank interchanges by existing problems and implementation opportunities

- Conduct a literature review of similar interchange analysis and investments to include best practices to evaluate and prioritize problems, and a variety of approaches and other lessons learned from the investment in these types of projects
- From literature review develop a toolbox of practical solutions
- Document upstream and downstream congestion, volume-capacity ratios, planned projects including preservation, MnPASS or general-purpose capacity, etc. by approach direction
- Identify other typical deficiencies that will be used to evaluate interchanges
- Specify the performance metrics for each problem type including delay, reliability, crashes, and freight specific prioritization (Regional Truck Freight Corridors, delay, reliability, crashes and HCAADT), transit riders, presence of MnPASS or planned MnPASS, etc.
- Provide a methodology of weighting (or other options) of performance metrics to rank interchanges given problem levels and implementation opportunities including planned investments
- Present methodology of problem and opportunity ranking to PMT for consideration and revise as necessary (note: experience in the region along with State and Metropolitan Council policy documents points towards a heavy emphasis on opportunities such as planned investments including preservation, MnPASS and others)
- Present to TAC and revise as necessary

Contractor Deliverables:

- Summary document of literature review and toolbox solutions
- Summary document of methodology and initial data collection

Subtask 2.3 Collect data required to measure problems and rank interchanges given methodology noted in task 2.2

- Provide State with list of readily available data it will be responsible to provide
Exhibit A - Scope of Work

- Provide alternatives to collect data State does not have available
- Collect additional data for all interchanges
- Develop Geographic Information Systems (GIS) database (or provide other methods to organize and display data)
- Monetize problems as a method of comparison or provide optional method (user value of time, standard economic costs of crashes, etc.)
- Identify recent or planned investments to be made by interchange and provide methodology to incorporate this into ranking
- Review of ranking of interchanges by problem level that recognizes programmed investments, and other implementation opportunities or obstructions
- Present methodology, data and ranked list to PMT for consideration and revise as necessary
- Present to TAC and revise as necessary

Contractor Deliverables:

- GIS database (or other agreed upon format) copy of data collected

Subtask 2.4 Select interchanges for phase 2 analysis

- Present PMT with short lists of interchanges to be evaluated in Phase 2 and provide rational for each list, revise as necessary
- Present to TAC and revise chosen list as necessary

Contractor Deliverables:

- Prioritized list of interchanges summarizing criteria and highlighting those to be carried forward for subsequent study

Task 3 Analyze interchange problems, provide design solutions, costs and relative ranking

Task Objective: A comprehensive planning-level problem analysis of the subset of interchanges (approximately 10) by approach. Evaluate select design solutions for each interchange that may include a lower cost (begins at a single flyover, bridge braid or MnPASS direct connection in the context of this study) and a more comprehensive design. Estimate the benefits, costs, hurdles and opportunities of each design at a planning-level. Rank each design solution by payback period or return on investment, and a summary of hurdles and opportunities. Document a sorted list of interchanges to be improved over a 20-year period given current and a possible increased revenue scenario.

Subtask 3.1 Collect data to analyze interchange problems and develop solutions

- Define specific performance measures for each problem type, consider mobility, reliability, crashes, and freight specific prioritization (Regional Truck Freight Corridors, delay, reliability, crashes and HCAADT), transit usage, trips lengths, etc.
- Define data needed to identify the cause of problems separated for ramps, mainlines, internal weaving, weaving with nearby interchanges and merge locations
- Work with State to determine the source of data and State’s role in data collection
- Collect and organize data
- Present data plan and data to PMT, revise as necessary
- Present to TAC and revise as necessary

Contractor Deliverables:
Exhibit A - Scope of Work

- GIS database (or other agreed upon format) copy of data collected

Subtask 3.2 Design a planning-level methodology to develop design solutions to interchange problems

- Provide methods that will be used to develop a range (approximately one to three for each of ten locations) of meaningful design solutions given time and budget constraints
- Define role of State’s staff in the design development and/or review process
- Define a process that will allow both low cost and more comprehensive solutions to be developed and comparatively evaluated
- Present a recommended methodology and viable options to PMT and revise as necessary
- Present to TAC and revise as necessary

Contractor Deliverables:

- Document summarizing agreed upon methodology

Subtask 3.3 Develop design solutions, and evaluate and suggest implementation priority at a planning-level

- Review Congestion Management Safety Plan (CMSP) 4 problem and solution recommendations
- Evaluate where problems can be addressed with buffer lanes, auxiliary lanes, MnPASS, other through lanes, improvements to parallel facilities or other similar strategies only and without flyovers, bridge braids and larger interchange improvements, in these cases document these locations for consideration elsewhere (likely CMSP, MnPASS or other forms of through Strategic Capacity) and replace this location with the next one on the list that did not pass the Task 2 screening
- Given problem causes by interchange approach, design solutions to resolve problems, in some cases in both a lower cost and a more comprehensive way, at approximately 10 interchange locations
- Estimate 2040 peak period volumes reflecting planned MnPASS lanes, general purpose capacity and other nearby operational improvements and consider these in the development of solutions
- For each interchange design solution, specify the percent of each problem that can be eliminated given each proposed solution
- For each interchange design solutions, estimate planning-level costs to implement including construction, right of way, etc.
- Calculate the payback period and/or return on investment for each improvement
- Where more than one potential solution exists (conflicting or opportunities for staged implementation) calculate marginal benefits and marginal costs of larger fixes in comparison to smaller fixes to understand if solutions are reaching a point of diminishing returns
- Document and consider opportunities such as nearby planned preservation, MnPASS and other investments (these have been found to be important drivers of investments and should be considered accordingly in this task)
- Provide a methodology to prioritize developed design solutions, and consider hurdles and opportunities such as planned investment in preservation, MnPASS or other categories
- Present results of design solutions and prioritization to PMT, revise as necessary
- Present to TAC and revise as necessary

Contractor Deliverables:
Exhibit A - Scope of Work

- GIS database (or other agreed upon format) copy of data collected
- Summary table of locations that can be addressed with investments below those of specific interest in this study
- Prioritized summary table of solutions developed and criteria for evaluating each

Subtask 3.4 Document study process, results and recommendations

- Describe the study process and analysis carried out in a technical memorandum
- Describe the comparative ranking or prioritization of interchanges given lower cost and more comprehensive designs solutions
- Describe the extent of the problems resolved under each solution
- Describe the payback period (or Return on Investment [ROI]) conclusion
- Develop an Executive Summary that gives an overview of the study process and rational for recommended investment priorities
- Review with PMT and revise as necessary
- Present to TAC and revise as necessary

Contractor Deliverables:

- Tech memo describing study process, results and recommendations

Subtask 3.5 Document policy implications and lessons learned

- With input from PMT draft a tech memo to document possible policy implications of this work and lessons learned from it
- Review with PMT and revise as necessary
- Present to TAC and revise as necessary

Contractor Deliverables:

- Memo summarizing policy implications and lessons learned from this study’s work

Project Schedule

Task 1 – Project Management (Ongoing, 52-78 weeks)

- Kick off Meeting with Project Management Team, Develop Detailed Schedule – June 2018 (2-4 weeks)
- First Technical Advisory Meeting – July/August 2018 (4-8 weeks)
- Develop Plan for Agency Outreach – June-August 2018 (4-12 weeks)

Task 2 – Problem Assessment and Screening (8-24 weeks)

- Determine interchanges to study, document recent investments – June-August 2018 (4-12 weeks)
- Provide recommended evaluation methodology – July-September 2018 (4-12 weeks)
- Collect data for evaluation, provide Phase 1 intersection ranking – June-October 2018 (4-16 weeks)
- Select interchanges for Phase 2 analysis, present to TAC – September-November 2018 (4-12 weeks)
Exhibit A - Scope of Work

Task 3 – Analyze interchange problems, provide design solutions, costs and relative ranking (40-52 weeks)

- Collect data to analyze interchange problems, develop solutions – September-December 2018 (4-16 weeks)
- Design a methodology to develop interchange design solutions – October-December 2018 (4-12 weeks)
- Develop solutions, evaluate & suggest implementation priority – November 18-June 19 (12-32 weeks)
- Document study process, results & recommendations in tech memo – June-September 2019 (4-16 weeks)
- Document policy implications and lessons learned in tech memo – July-November 2019 (12-20 weeks)

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Figure 1: Initial System Interchange Locations for Study