MnDOT/Met Council: Freeway System Interchange Study

Metropolitan Council Transportation Committee
March 23, 2020
Background

• Investment prioritization study
• System interchanges connect two freeways
• Locations have been evaluated independently
• Interchange Issues:
  • Congestion
  • Crashes
• Systemwide numerous identified needs

Source: Google
Purpose

- Systematically discover and prioritize opportunities across region
- Reduce delay and crashes
- Consider needs of freight and transit
- Right-size investments

Source: SRF Consulting Group
Example of recent investment: I-494/I-35W in Bloomington/Richfield

- North to west directional ramp
- Corridors of Commerce awarded $70 million to begin in 2021
- Includes directional ramp and bridge braids

Source: City of Bloomington
# Stakeholder Engagement

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Study Process

Determine locations to be studied

Evaluate current issues

Identify critical problem magnitudes

Consider asset condition and traffic operations

Identify improvement opportunities

Consider recent investments and bottleneck causes

Develop a range of solutions

Estimate return on investment

Document observations for future investments

Solution locations

Right-sized solutions

Focus locations

Regional opportunities

Study interchanges
Phase 1: Study Interchanges
Study Interchanges

- 56 interchanges
  - Cloverleaf – 23
  - Downtown commons – 6
  - Other interchange types - 27
Phase 2: Focus Locations
Weighting

• Technical scoring process based on performance measures and weights
Focus Locations

- **37** system interchanges with **94** focus locations
  - Top 63 approaches
  - 31 add’l Interstate-to-Interstate
Phase 3: Solution Locations
Bottleneck Definitions

Interchange bottleneck

Congestion is attributed to geometric and/or demand conditions in the system interchange area (approach, within, departure)

Upstream bottleneck

Congestion is present upstream of the system interchange such that, if resolved, would deliver meaningfully more traffic (would affect operations)

Downstream Bottleneck

Congestion downstream of the system interchange that would worsen if more traffic were delivered, or may be queuing back through the interchange

Primary bottleneck

Location that is the principal cause of congestion observed in the influence area, and may be masking other bottlenecks

Outcome: Carry approaches forward to Solution Locations when Interchange bottleneck = Primary bottleneck
Phase 4: Right-Sized Solutions
Solution Development

Low Scope
- Auxiliary lanes
- Buffer lanes
- Acceleration lanes
- Escape lanes
- Signage enhancements
- ATM strategies

Medium Scope
- CD road
- Ramp consolidation
- Two-lane ramp
- Ramp geometric enhancements (e.g. radius)
- Access control

Large Scope
- Bridge braids
- Flyovers
- Turbine ramps
- MnPASS connection
- Transit advantages
Solution Development

- Bottom-up design approach
  - Assess if lower-cost solutions can address operational issues before moving to higher-cost solutions

Low Scope Solutions
- Planning-level concept sketches
- Assess severity of pavement and grading, right-of-way impacts, etc.

High Scope Solutions
- Detailed design intended for complex project alternatives
- Assess vertical and horizontal clearance, quantify itemized construction elements, etc.

Solution locations
→ Lower-cost solutions

Assess higher-cost solutions
→ Regional opportunities

Solution Toolbox

RP Analysis

Effectiveness Evaluation
Right-Sized Solution Locations
Phase 5: Regional Opportunities
Freeway System Interchange Investment Approach

- Preservation projects should be used as a catalyst to address other identified safety, mobility, freight, bicycle, and pedestrian needs.
- Integrating with preservation projects:
  - Minimizes costs
  - Reduces inconvenience to travelers
  - Addresses multiple policy objectives
- Where mobility needs are identified, investments should be made in lower cost projects that produce high benefits and avoid exceeding the point of diminishing returns.

The “Regional Opportunity” categories are intended to inform project scoping and future funding decisions.

Funding plans, funding decisions, and project priorities will be proposed by MnDOT and the Metropolitan Council separate from this study process.
Thank you!

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