Regional Solicitation
Before & After Study
Phase II

May 2021
Project Team

Consulting Team

Lance Bernard
HKGi
lance@hkgi.com
320.420.7768

Ashley Hudson
Bolton & Menk
Ashley.Hudson@bolton-menk.com
701.566.2349

Met Council
David Burns
Senior Highway Planner
David.Burns@metc.state.mn.us
651.602.1887
Study Objectives

• Task 1: Measure the benefits of funded projects by comparing their before & after conditions.

• Task 2 - 6: Research Ways to Streamline the Application Process.
  – Focus Groups
  – Bicycle and Pedestrian Usage Measure
  – Projects Not Funded by Regional Solicitation
  – Risk Assessment
  – Best Practices for Crash Modification Factors (CMFs)

Update was provided at the April 22, 2021 TAC F&P Meeting
Phase I Study Measures

- Performance Measure #1: Roadway Congestion
- Performance Measure #2: Roadway Safety
- Performance Measure #3: Transit
- Performance Measure #4: Bicycle & Pedestrian Safety
- Performance Measure #5: RBTN Contribution
- Performance Measure #6: Pedestrian/Bicycle Connections Achieved
- Performance Measure #7: HSIP Safety Benefits
Challenges: Best practices suggest two to three years of “after” condition data is needed to provide an accurate picture of benefits (e.g., reduction in roadway congestion and crashes). This has presented challenges in measuring a number of projects since the 2014 funding cycle.

<table>
<thead>
<tr>
<th>Regional Solicitation Year</th>
<th>Program Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>2017, 2018 &amp; 2019</td>
</tr>
<tr>
<td>2016</td>
<td>2020 &amp; 2021</td>
</tr>
<tr>
<td>2018</td>
<td>2022 &amp; 2023</td>
</tr>
<tr>
<td>2020</td>
<td>2024 &amp; 2025</td>
</tr>
</tbody>
</table>
Measuring Before & After Conditions

**Challenges:** 2020 and 2021 data sets (e.g., crash data, traffic volumes, and transit ridership) are not accurate/reliable – too many anomalies on how people were moving throughout the region during the pandemic.
Measuring Before & After Conditions

- Explored New Methodologies
  - Streamline the reporting process
  - Utilize “Big Data” sets

- Developed How to Manuals
  - The congestion methodology has been refined to use StreetLight Data.
  - A tailored crash reporting system (using GIS and MnCMAT data) was developed to monitor “after” conditions.
Congestion Measure

- Roadway congestion benefits are typically measured by conducting a no-build (without improvement) and build (with improvement) condition by using traffic modeling software (i.e., Synchro analysis).

- This requires a larger level of effort to replicate to conduct after analysis of a built project.
  - Data collection
  - Turning movement counts
  - Traffic model development
Congestion Measure

• StreetLight data was tested to measure before & after conditions for six roadway expansion projects to determine travel time reductions.
• StreetLight data is subscription-based service that provides an aggregate of location-based service records collected from cellphone providers that track traffic congestion and traffic times, amongst other attributes.
Congestion Measure

• StreetLight data offers data sets that have been populated as early as 2011, giving greater confidence in using the data to analyze before & after conditions.

• 2014 Regional Solicitation: Roadway Expansion Projects
  – TH 41 Expansion (Carver County)
  – 70th St and Robert Trail Roundabout (Dakota County)
  – CSAH 42/52 Interchange (Rosemount)
  – CSAH 13/I-94 Crossing (Woodbury)
  – CSAH 31 Expansion (Eagan)
# Congestion Measure

## 2014 Regional Solicitation: Funded Roadway Expansion Projects

<table>
<thead>
<tr>
<th>Project Description</th>
<th>AM</th>
<th>PM</th>
<th>All Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>TH 41 Expansion (Carver County)</td>
<td>19%</td>
<td>2%</td>
<td>11%</td>
</tr>
<tr>
<td>70th St and Robert Trail Roundabout (Dakota County)</td>
<td>1%</td>
<td>17%</td>
<td>7%</td>
</tr>
<tr>
<td>CSAH 42/52 Interchange (Rosemount)</td>
<td>10%</td>
<td>-3%</td>
<td>13%</td>
</tr>
<tr>
<td>CSAH 13/I-94 Crossing (Woodbury)</td>
<td>6%</td>
<td>5%</td>
<td>4%</td>
</tr>
<tr>
<td>CSAH 31 Expansion (Eagan)*</td>
<td>-50%</td>
<td>-37%</td>
<td>-28%</td>
</tr>
</tbody>
</table>

*Central Park Commons shopping center partially opened during analysis periods, causing incomparable results*
## Congestion Measure

### Travel Time Reduction

<table>
<thead>
<tr>
<th>2014 Regional Solicitation: Funded Roadway Expansion Projects</th>
<th>AM</th>
<th>PM</th>
<th>All Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>TH 41 Expansion (Carver County)</td>
<td>14%</td>
<td>29%</td>
<td>20%</td>
</tr>
<tr>
<td>70th St and Robert Trail Roundabout (Dakota County)</td>
<td>6%</td>
<td>15%</td>
<td>7%</td>
</tr>
<tr>
<td>CSAH 42/52 Interchange (Rosemount)</td>
<td>5%</td>
<td>6%</td>
<td>16%</td>
</tr>
<tr>
<td>CSAH 13/I-94 Crossing (Woodbury) *</td>
<td>-3%</td>
<td>-8%</td>
<td>0%</td>
</tr>
<tr>
<td>CSAH 31 Expansion (Eagan) **</td>
<td>-43%</td>
<td>-19%</td>
<td>-24%</td>
</tr>
</tbody>
</table>

*Due to later construction finish analysis periods were different then others and the after was closer to the start of COVID

**Central Park Commons shopping center partially opened during analysis periods, causing incomparable results
Safety Measure

- Roadway safety benefits have typically been collected by manually comparing the before and after crash analysis often collected from MnCMAT.
- This requires time to extract and assemble data to conduct after analysis of a built project.
  - Data collection
  - Calculation to determine total crashes reduced
  - MnDOT crash listing and diagram
Safety Measure

• A customized Geographic Information System (GIS) tool was created to automate monitoring and reporting results.

• The following is reported for the 2014 Roadway Expansion and Reconstruction/Modernization projects:
  - Total crashes
  - Crash costs
  - Fatal and serious crashes
  - Pedestrian or bike crashes
  - Crash rate
  - Fatal and serious crash rate

Developed “How To Guide” for more efficient before and after data collection
Safety Measure

• A three year window (minimum) of crash data is best to measure safety outcomes. Projects with less than three years of after data should be considered “preliminary findings”.

• Projects completed after 2017 are preliminary.

• The following projects were completed before January 2018 and have a full three years of crash data.
  – CSAH 3/Lake Street Reconstruction (Hennepin County)
  – CSAH 31/Pilot Knob Road (City of Eagan)
  – CSAH 65/White Bear Ave Reconstruction (Ramsey County)
## Safety Measure

### 2014 Regional Solicitation: Funded Expansion & Modernization Projects

<table>
<thead>
<tr>
<th>Project Description</th>
<th>Total Crashes</th>
<th>Crash Cost</th>
<th>Total K &amp; A</th>
<th>Total Ped &amp; Bike</th>
<th>Crash Rate*</th>
<th>K &amp; A Crash Rate**</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSAH 3/Lake Street Reconstruction (Hennepin County)</td>
<td>-40</td>
<td>-$2.5M</td>
<td>-2</td>
<td>-2</td>
<td>-7.31</td>
<td>-32.61</td>
</tr>
<tr>
<td>CSAH 31/Pilot Knob Road (City of Eagan)</td>
<td>-31</td>
<td>-$400K</td>
<td>0</td>
<td>+1</td>
<td>-4.07</td>
<td>0</td>
</tr>
<tr>
<td>CSAH 65/White Bear Ave Reconstruction (Ramsey County)</td>
<td>-26</td>
<td>-$97K</td>
<td>0</td>
<td>+1</td>
<td>-1.55</td>
<td>0</td>
</tr>
</tbody>
</table>

*Crash rate is per million vehicle miles traveled

**K&A is per 100M vehicle miles traveled
Thank You