SHRP 2 Project L38 Pre-Kickoff Webinar

Pilot Testing of SHRP 2 Reliability Data and Analytical Products

Approach to Pilot Testing in Southern California

March 13, 2013

System Metrics Group, Inc.
Background

➢ The SHRP 2 Reliability projects have researched methods to help public agencies:
  ➢ Collect and analyze data on the variability of travel time
  ➢ Diagnose problems
  ➢ Propose actions or alternative mitigation strategies
  ➢ Test the impacts of solutions

➢ These products have the potential to fill a void

➢ Operational strategies are critical to improving mobility and travel time reliability
  ➢ Implemented faster
  ➢ Cost less than large expansion projects

➢ Traditional tools (including micro-simulation) cannot estimate the benefits of reliability projects

➢ It is time to test SHRP 2 products against real corridors, complex data sets, and even more complex political processes
General Approach for Testing in Southern California

- Practical, yet critical evaluation of products and concepts developed to date

- We are testing in conjunction with two public agencies:
  - Southern California Association of Governments (SCAG)
  - California Department of Transportation (Caltrans)

- Both agencies are already interested in and actively involved in analyzing travel time reliability

- By working with “advanced users,” we can test two aspects of the SHRP 2 products:
  - **Technical functionality** – How easy are the products to use? How consistent are they with each other and prior work?
  - **Practical use** – Do they help Southern California select and prioritize projects? Do decision-makers understand the reliability analyses and find the results credible?
Caltrans is committed to system management

Issue Areas

- Focusing on operational strategies
- Coordinating traffic operations with system planning
- Measuring benefits of operational strategies
- Developing corridor “playbooks”
SCAG has adopted reliability as a performance measure for its Regional Transportation Plan (RTP)

Background

- Long history of performance-based transportation planning
- Recognition of importance of operational strategies
- 2012-35 RTP includes reliability goal with 10-percent improvement benchmark
- SCAG Board directed staff to work on further quantification of performance measures

RTP Goals

- Align the plan investments and policies with improving regional economic development and competitiveness
- Maximize mobility and accessibility for all people and goods in the region
- Ensure travel safety and reliability for all people and goods in the region
- Preserve and ensure a sustainable regional transportation system
- Maximize the productivity of our transportation system
- Protect the environment and health for our residents by improving air quality and encouraging active transportation (non-motorized transportation, such as bicycling and walking)
- Actively encourage and create incentives for energy efficiency, where possible
- Encourage land use and growth patterns that facilitate transit and non-motorized transportation
- Maximize the security of the regional transportation system through improved system monitoring, rapid recovery planning, and coordination with other security agencies
Both agencies have invested significance resources into Corridor System Management Plans (CSMPs)

- Comprehensive performance assessments (includes baseline reliability)
- Corridor micro-simulation models
- Testing of capacity projects and operational strategies
- Benefit-cost assessments
Southern California Pilot Site

- Most congested region in the country
- Extensive detection coverage (PeMS)

- Complex organizational relationships and decentralized decision-making
  - 25/75 percent funding split between Caltrans and regional agencies
  - Self-help counties (e.g., Los Angeles county has 1.5% sales tax dedicated to transportation)

- Existing SCAG policy and technical committees to help facilitate feedback
SMG and CLR Analytics will conduct much of the technical and analytical work

We will work closely with our public agency partners

As a planning and programming agency, SCAG will provide extensive input and feedback
SCAG is playing a critical role in the testing

- Helping to select corridors for the pilot test
- Reviewing work products and providing feedback as potential user of tools
- Coordinating/facilitating input from the larger stakeholders group using SCAG’s existing policy and technical committee structure
  - Caltrans district offices
  - County transportation commissions
  - Elected officials
General Steps for Pilot Test

- Review corridors with existing CSMPs
- Compare corridor reliability, understand causes, and select one to two most promising corridors for reliability improvement
- Use SHRP 2 tools to develop more detailed, robust analyses of travel time reliability
- Leverage available micro-simulation models, travel demand models, detection, and automated sensor data collection
- Test recently programmed/planned projects and potential operational strategies
- Present results to SCAG policy and technical committees

In the end, we hope to have better CSMPs and quantification of reliability for benefit-cost analysis and goal setting
## Project Steps

<table>
<thead>
<tr>
<th>Task #</th>
<th>Task Description</th>
<th>FY 12/13</th>
<th>2013</th>
<th>FY 13/14</th>
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<tbody>
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<td>1</td>
<td>Attend One-Day Briefing (Kickoff)</td>
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<td>Attend a one-day briefing in Washington, D.C.</td>
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<td>2</td>
<td>Prepare Revised Research Plan</td>
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<td>Describe and Execute Data Compilation and Integration</td>
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<td>Analyze Baseline Reliability and Alternative Strategies</td>
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<td>4A</td>
<td>Prepare Analysis of Existing Conditions</td>
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<td>4B</td>
<td>Identify Alternative Strategies to Test</td>
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<td>4C</td>
<td>Analyze Impacts of Alternative Strategies</td>
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<td>4D</td>
<td>Conduct Benefit-Cost Analysis of Strategies</td>
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<td>Prepare Interim Report</td>
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<td>Incorporate in Decision-Making Process</td>
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<td>Funding for Mitigating Strategies</td>
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<td>Evaluate Functionality of Products and Outcomes</td>
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<td>Prepare Draft Final Report</td>
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<td>Draft Final Report</td>
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Our initial work will be to select corridors for pilot testing from corridors with CSMPs... and develop a better understanding of reliability
But, the majority of our effort will be spent on Task 4

Our approach is modeled on a use case (AE4 Assist in Planning and Programming Decisions) from the Project L02 Guidebook and is similar to the CSMP process

- Subtask 4A: Prepare Analysis of Existing Conditions
  - Travel Time Reliability Calculation
  - Data Imputation
  - Influencing Factor Analysis
  - Origin-Destination (OD) Perspective
  - Baseline Condition Estimation in SHRP 2 Tools

- Subtask 4B: Identify Alternative Strategies to Test

- Subtask 4C: Analyze Impacts of Alternative Strategies

- Subtask 4D: Conduct Benefit-Cost Analysis of Strategies
We have selected SHRP 2 products most applicable to corridor management planning in California

California planning activities that may be improved by SHRP 2 products:

- Development of CSMPs and operating “playbooks”
- Expansion of benefit-cost analysis (BCA) capabilities
- Goal setting for the Caltrans State Highway Operations and Protection Program (SHOPP) and SCAG RTP
We plan to use products from several SHRP 2 projects

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<tr>
<th>Type of Product</th>
<th>L02</th>
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Questions: Do the procedures and use cases help us identify the contributions of factors to reliability and better describe reliability conditions for a corridor?
Project L05 Strategy Identification and Goal Setting

Questions: Are the guidelines found in L05 helpful in choosing goals, setting benchmarks, and picking strategies?
Questions: Is the tool easy to use? Does it produce meaningful results? How do the results compare to the baseline, micro-simulation models, and other SHRP 2 tools? Does the tool help Caltrans engineers pick effective design strategies as operations investments?
Questions: How well does the “data rich” FREEVAL-RL freeway methodology predict future reliability? Do the methods capture the benefits of operational projects likely to be tested in California? How do the results compare to the baseline, micro-simulation models, and other SHRP 2 tools?
Questions: Do the reliability results seem reasonable? Are they consistent with the predictions of micro-simulation models and other SHRP 2 tools? Can the tool be incorporated with existing Caltrans tools for benefit-cost analysis? Can other reliability estimates be substituted easily into the model?
The final evaluation will focus on implementation

➢ Technical Functionality
  – Do the tools already developed provide reasonable results for a variety of improvement strategies focused on operations?
  – Which tools were easier to use?
  – What tools provided more reasonable results?
  – What problems did the research team and agencies have using the different tools?
  – What changes would we recommend for the tools and why?

➢ Practical Use
  – How well does the work completed to date help SCAG and Caltrans better understand the causes of baseline reliability?
  – How did technical staff at SCAG and Caltrans react to the work? Did it make sense to them? Was it too complicated to duplicate internally?
  – How did the policy members react to the results? Would the results have changed project priorities? How willing were they to incorporate them into programming decisions in the near future?