



Performance Specifications for Rapid Renewal (R07)

July 24, 2013



U.S. Department of Transportation
Federal Highway Administration



TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES
1

Agenda

- SHRP2 Overview
 - What is SHRP2?
 - Focus Areas
 - Implementation Assistance
- Technical Product Description
- Product Implementation
- Implementation Timeline
- Questions?



Source: Iowa DOT

What is SHRP2?

(Second Strategic Highway Research Program)

Save lives. Save money. Save time.



- Products developed from objective, credible research
- Solutions that respond to transportation community challenges – safety, aging infrastructure, congestion
- Tested products, refined in the field

SHRP2 Solutions offer new technologies and processes to enhance the efficiency of transportation agencies

Why is SHRP2 Important?

Tools for the Road Ahead

SHRP2 Solutions have the power to change the way transportation agencies do business.

- ➔ *By providing new research-based tools and innovative products and processes...*
- ➔ *That will create more efficiencies and a smarter use of state and federal investments of taxpayer dollars.*



Focus Areas



Safety: fostering safer driving through analysis of driver, roadway, and vehicle factors in crashes, near crashes, and ordinary driving



Renewal: rapid maintenance and repair of the deteriorating infrastructure using already-available resources, innovations, and technologies



Capacity: planning and designing a highway system that offers minimum disruption and meets the environmental and economic needs of the community

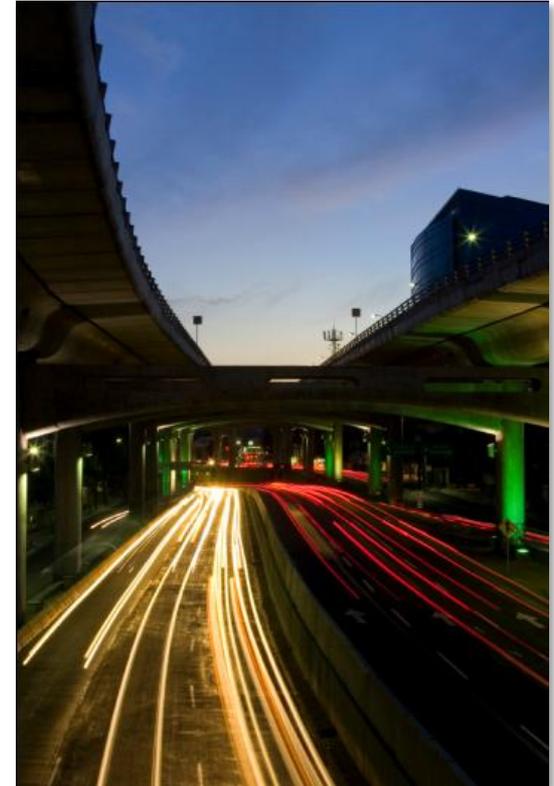


Reliability: reducing congestion and creating more predictable travel times through better operations

Implementing SHRP2 Solutions

Moving Forward

- Approximately 66 high-priority products introduced over the next several years
- Users run the gamut of the transportation industry
- Selected products integrated into current transportation practices



SHRP2 Implementation Assistance Program

Proof of Concept Pilot

- Funds for piloting products to evaluate readiness for implementation
- Contractor support to collect data and evaluate the application

Lead Adopter Incentive

- Funds for early adopters to offset implementation cost and mitigate risks
- Recipients required to provide specific deliverables designed to further refine the product, and possibly “champion” the product to other states and localities

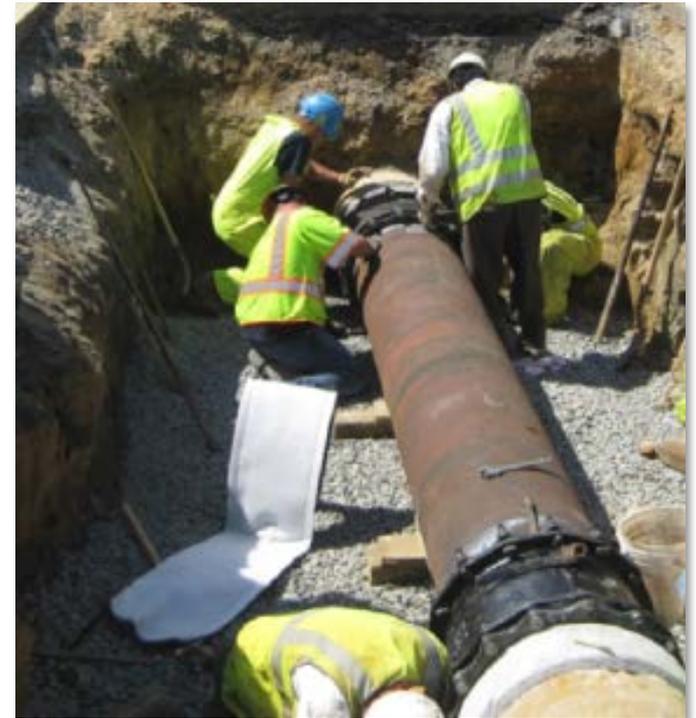
User Incentive

- Funds for implementation support activities after early adopter use
- Used to conduct internal assessments, build capacity, implement system process changes, organize peer exchanges, or offset other implementation costs

Round 1 Implementation Assistance

First Round at a Glance

- 34 states and the District of Columbia
- 6 SHRP2 Solutions at work on 108 transportation projects
- 2 proof of concept pilots
- 74 lead adopter incentives
- 24 user incentives
- Limited technical assistance to 8 states



Round 2 Implementation Assistance



Capacity

- Expediting Project Delivery (C19)



Renewal

- Performance Specifications for Rapid Renewal (R07)
- Managing Risk in Rapid Renewal Projects (R09)
- Railroad-DOT Mitigation Strategies (R16)

Product Implementation Assistance Opportunities

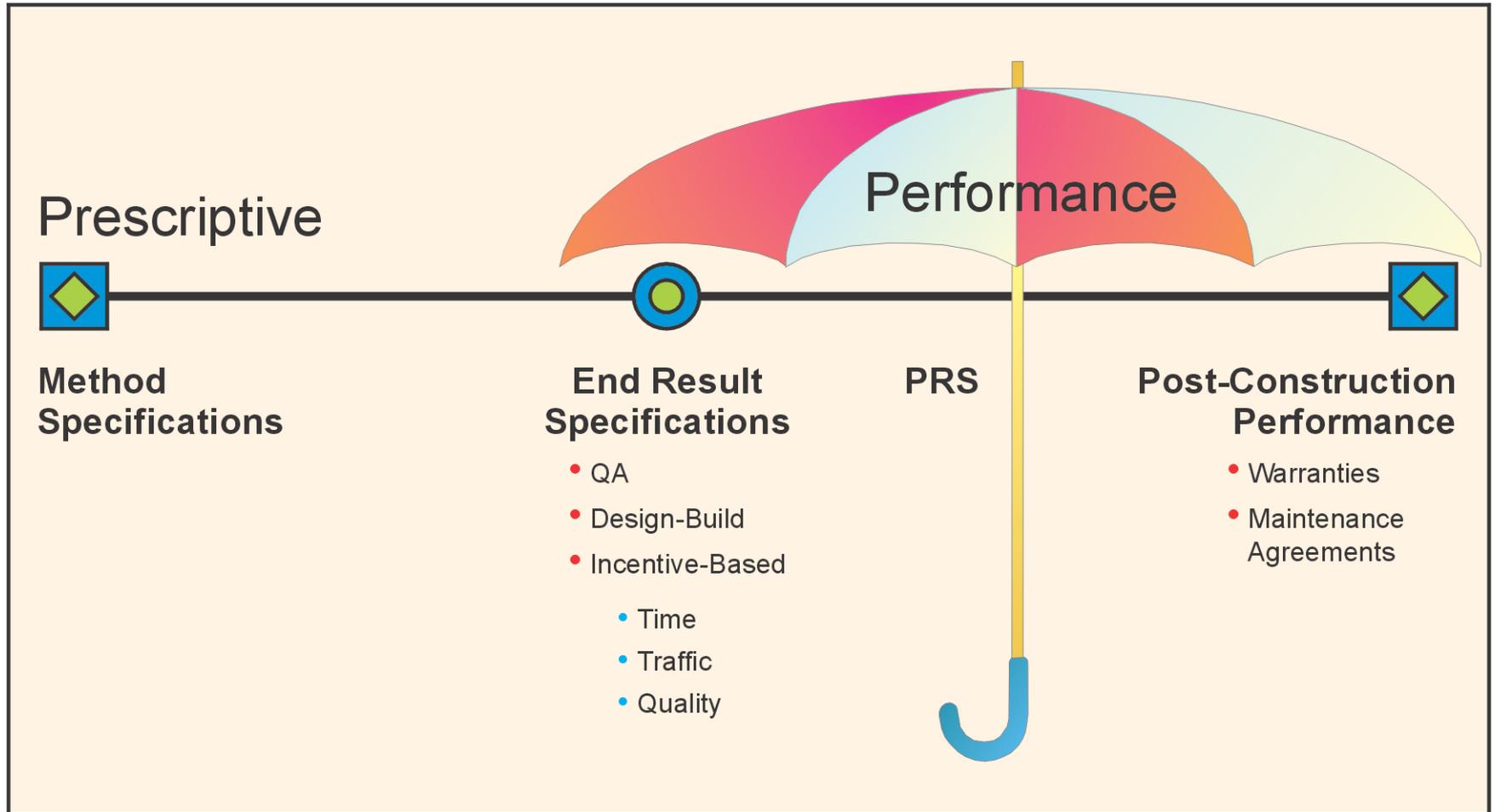
Product	Proof of Concept Pilot	Lead Adopter Incentive	User Incentive
C19: Expediting Project Delivery		5	5
R07: Performance Specifications for Rapid Renewal		4	
R09: Managing Risk in Rapid Renewal		4	
R16: Railroad-DOT Mitigation Strategies		4	4

Implementation Assistance Selection Criteria

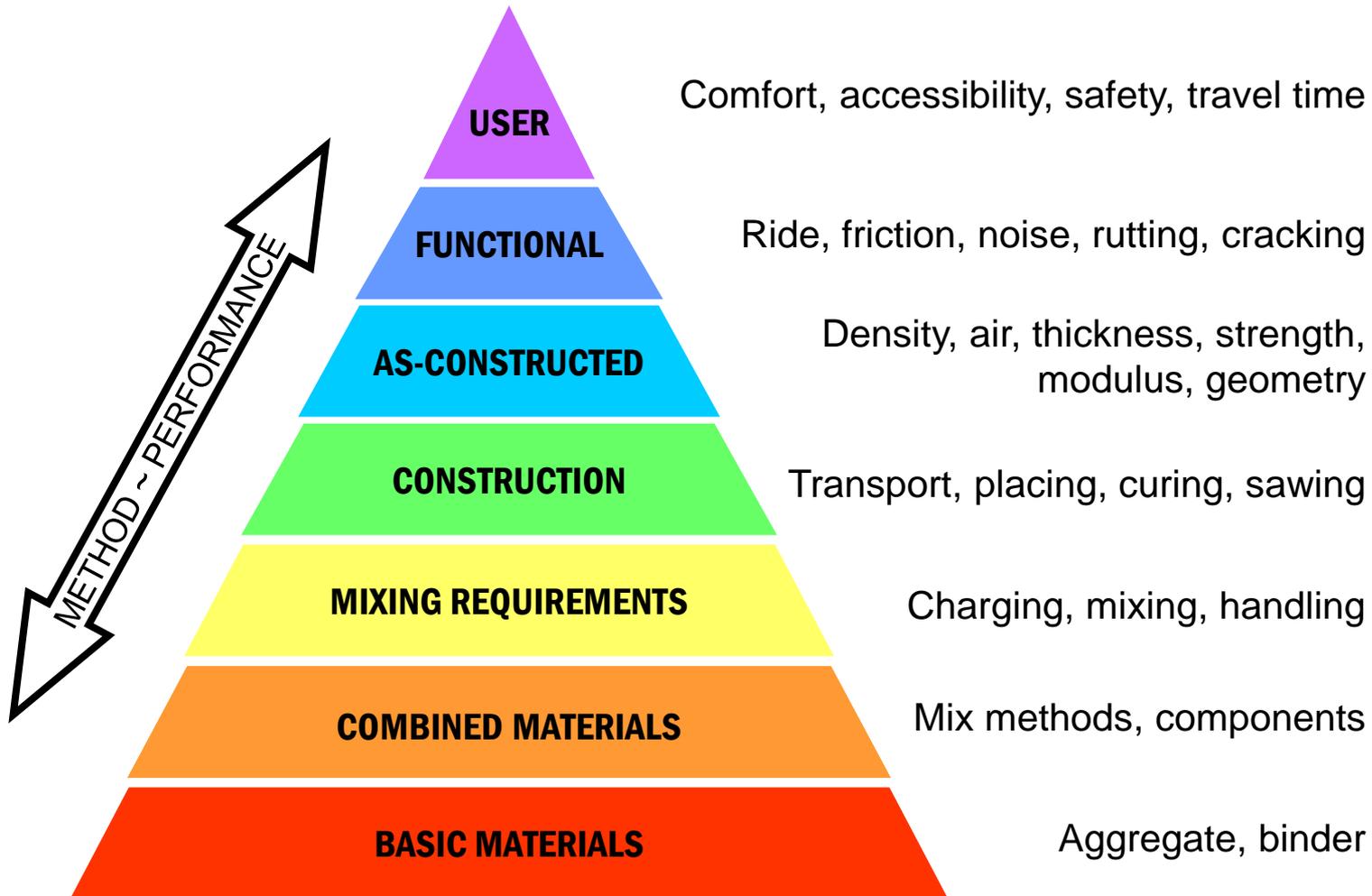
General Criteria for Participants (will vary somewhat among products)

- Geographic diversity of participants
- Demonstrated culture to implement new products or processes
- Demonstrated past interest and/or efforts to implement similar products or processes
- High commitment to making institutional/organizational changes
- Commitment to conduct demonstration workshops
- Willingness to share experience by facilitating peer-to-peer activities
- Commitment to dedicate staff to the implementation project

Specification Continuum



Pyramid of Performance



R07 Deliverables



1. Final research report
2. Strategies for Implementing Performance Specifications: A Guide for Executives and Project Managers
3. Developing and Drafting Effective Performance Specifications: A Guide for Specification Writers
4. Guide performance specifications

Final Report



- Research methodology and results
- Appendices
 - Demonstration project reports
 - Experimental research specifications for using intelligent compaction techniques for acceptance purposes
 - Proof rolling/mapping
 - Earthwork/pavement foundation

Implementation Guidelines

Strategies for Executives & Project Managers

1. Rationale for using performance specifications
2. Organizational considerations
3. Industry considerations
4. Legal perspectives
5. Process for deciding to use performance specifications
6. Project delivery and procurement considerations

Implementation Guidelines

Specification Writer's Guide

1. Introduction to performance specifications
 - How do performance and method specifications differ
 - Deciding between method and performance specifications
2. Conceptual framework for developing performance specifications
 - Pyramid of Performance
 - 8-step process
3. Using the guide performance specifications

Guide Performance Specifications

1. Asphalt pavement (DBB)
2. Asphalt pavement (DB)
3. Asphalt pavement (Warranty)
4. Concrete pavement (DBB)
5. Concrete pavement (DB)
6. Concrete pavement (Warranty)
7. Precast concrete pavement
8. Pavement (Design-Build-Operate-Maintain)
9. Concrete bridge deck
10. Vertical support elements
11. Subsurface improvements for existing pavements
12. Work zone traffic control
13. Quality management

(Also, the Final Report appendices contain two additional “research” specs related to the use of intelligent compaction techniques for roadway ground improvement and proofmapping for acceptance purposes)

Validation – Demonstrations

MDOT Route 141 Roadway Improvement Project Outcomes

- Use intelligent compaction (IC) to eliminate traditional proof rolling step (for acceptance)
- IC provides geospatially referenced map w/ 100% coverage to immediately identify areas needing further work
- Real-time information to contractor during compaction operations
- Correlates to mechanistic subgrade performance parameters (bearing capacity & stiffness)
- Accelerate operations
- Improve quality/uniformity of pavement subgrade



CS-563E Smooth drum roller



815F impact roller

Validation – Demonstrations *(cont.)*

VDOT Route 208 Bridge Deck Replacement over Lake Anna, Virginia Outcomes

- Demonstrate bridge deck performance specifications
- In addition to standard requirements, used parameters that relate more directly to performance (e.g. PCC deck permeability, cracking, and cover depth)
- Improved QMP requirements to address workmanship issues – checklist for inspection



VDOT Route 208 Bridge Deck

Validation – Demonstrations *(cont.)*

Geotechnical/Pavement Performance Specifications (collaboration with LaDOTD/LTRC)

LaDOTD US 90 Frontage Roads in Iberia Parish, Louisiana

- Assess combined geotechnical and HMA pavement system
- Collect mechanistic-based measurements for flexible pavements (e.g. IC and in-situ NDT point measurements and tests) to improve quality control and pavement performance
- Establish long-term performance monitoring and benchmarking to assess relative benefits of performance specifications

Performance Specs for Rapid Renewal – R07

Challenge

Conventional approaches to highway construction use prescriptive requirements that place the burden on owners to design, specify, and control the work. These requirements often hinder the innovation needed to deliver projects faster or find methods that minimize disruption. Performance specifications that emphasize desired results are needed.

Solution

- Implementation guide.
- Model performance specifications for various project types (pavements, geotechnical, bridges) and project delivery methods.



Performance Specs for Rapid Renewal – R07 *(cont.)*

Implementation guide for executives

- Addresses
 - Project selection
 - Specification development
 - Procurement
 - Other cultural and organizational changes necessary to achieve desired performance
- Model performance specifications for various
 - **Product types:** pavements, geotechnical, bridges, etc.
 - **Project delivery methods:** design-bid-build, design-build, design-build-warranty, and design-build-operate-maintain



Prepublication documents:

<http://www.trb.org/Main/Blurbs/169107.aspx>

Benefits

- Encourages contractors to apply greater control and ingenuity
- Improves project quality
- Accelerates construction
- Minimizes costly construction oversight
 - Ensures construction management resources are applied efficiently
 - Reduces claims and inspection costs



Implementation Strategies



- Promote the Decision Support Guide for Performance Specifications
- Provide peer-to-peer technical support to help agencies modify ready-to-implement specifications to meet individual state needs
- Maintain a library of applied specifications
- Seek standardization of testing parameters, procedures, and reporting practices for equipment

Assistance Opportunities

Second Round - Aug 2013	Proof of Concept Pilot	Lead Adopter Incentive	User Incentive
R07 – Performance Specs.	0	4	0

- Lead adopters will evaluate and validate R07 by applying process to transportation projects
- State DOT will provide feedback on process and benefits of product
- State DOT will become champion for product implementation in other states or to other agencies

Expectations for Lead Adopters

- Commitment of State DOT leadership to work through the *Implementation Guidelines for Decision Makers*
- Identification of at least one product (HMA, PCCP, bridge, work zone safety, etc.) for which to develop a state appropriate performance specification using the *Specification Writers' Guide*
- Identification of one or more projects to test the use of the specification through either direct or shadow application
- Willingness to share any performance specification developed through this process
- Participation in R07 product evaluation, including a qualitative, organizational, and before/after assessment conducted by an independent consultant for FHWA
- Willingness to share knowledge with at least two other state DOTs interested in implementing performance specifications

Application Tips



- Clear purpose statement
 - What does the state transportation agency (STA) hope to gain by using performance specifications?
 - Is there a specific construction, quality, longevity, or resource issue to be resolved?
 - How will the STA determine success?
- Approach
- Timetable
- Extent (project or program approach)

Round 2 Implementation Assistance Schedule

- Product Webinars held in July

R16 – Railroad-DOT Mitigation Strategies	July 18	2-3:30 p.m.
C19 – Expediting Project Delivery	July 23	12-1:30 p.m.
R07 – Performance Specifications for Rapid Renewal	July 24	12-1:30 p.m.
R09 – Managing Risk in Rapid Renewal	July 26	12-1:30 p.m.

- Implementation Assistance Timeline

- Application period opens August 2
- Application period closes September 6
- Awards announced Mid-October

- More information at www.fhwa.dot.gov/goshrp2

Additional Resources

- State Visits

- SHRP2 Tuesdays

C19 June 4 <http://www.trb.org/PlanningForecasting/Blurbs/168845.aspx>

R07 June 11 <http://www.trb.org/Pavements/Blurbs/168927.aspx>

R16 July 9 <http://www.trb.org/Railroads/Blurbs/169188.aspx>

R09 August 20 at 2:00 p.m. ET



SHRP2 on the Web

- **goSHRP2 (launches Aug. 2)**
www.fhwa.dot.gov/goSHRP2
 - Information about SHRP2 implementation phase
 - Launch coincides with opening of Round 2 Implementation Assistance
- **SHRP2 @TRB**
www.TRB.org/SHRP2
 - Information about research phase
- **SHRP2 @AASHTO**
<http://SHRP2.transportation.org>
 - Implementation information for AASHTO members

SHRP2 SOLUTIONS
TOOLS FOR THE ROAD AHEAD

Home About Solutions Your SHRP2 Resources News & Events Get Involved FAQ

Save lives.
Save money.
Save time.

The second Strategic Highway Research Program (SHRP2) is at the forefront of transportation innovation—helping the Nation's transportation community improve safety, enhance productivity, boost efficiency and increase reliability by introducing solutions that improve the country's highway network. [Read More](#)

Your SHRP2
Guides, training materials, and new technology—Real solutions to help you solve real problems.

Transportation Agencies
Private Industry
Research Community
Stakeholders and Users

Solution Spotlight
Implementing Eco-Logist
A practical guide to address ecological priorities in highway planning.

Get Involved
Apply for funding and support to deploy SHRP2 Solutions.

SHRP2 Nationwide
Locate SHRP2 Solutions projects in the field.

Talking About SHRP2
"If you can keep your treatment costs down for a longer period of time and push out those major repairs, then you've saved every real dollar."
—John Tomlinson, North Carolina Department of Transportation

Tools You Can Use
Effective solutions to meet real challenges.
SHRP2 presents innovations that address the transportation topics you care about. Use the site to discover SHRP2 Solutions, available now at working sites, that can help save fuel, money, and time.

Resources
Webinars, videos, and fact sheets featuring SHRP2 information.

Solutions by Focus Area

Safety Identifying the behaviors that cause and avert collisions.	Renewal Enabling faster, minimally disruptive, and longer-lasting improvements.	Reliability Diminishing predictable travel times.	Capacity Bringing greater collaboration to road building.
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Questions?



R07 Report:

<http://www.trb.org/Main/Blurbs/169107.aspx>

Implementation Assistance:

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