SHRP2 SOLUTIONS
TOOLS FOR THE ROAD AHEAD

Expediting Project Delivery Webinar – Improving Project Delivery Outcomes in Documentation and Construction

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U.S. Department of Transportation
Federal Highway Administration

American Association of State Highway and Transportation Officials
AASHTO

SHRP2 & Its 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.

R10 – Project Management Strategies for Complex Projects

- Five-dimensional project management approach to identify any issues that should be planned for and managed proactively in the following project elements:
  - Cost
  - Schedule
  - Technical
  - Financial
  - Context
- The planning methods are:
  - Define critical project success factors
  - Assemble project team
  - Select project arrangements
  - Prepare early cost model and finance plan
  - Develop project action plans

R10 Project Management Tools

- Tool 1: Incentivize Critical Project Outcomes
- Tool 2: Develop Dispute Resolution Plans
- Tool 3: Perform Comprehensive Risk Analysis
- Tool 4: Identify Critical Permit Issues
- Tool 5: Evaluate Applications of Off-Site Fabrication
- Tool 6: Determine Involvement in ROW and Utilities
- Tool 7: Determine Work Packages and Sequencing

R10 Project Management Tools (cont.)

- Tool 8: Design to Budget
- Tool 9: Colocate Team
- Tool 10: Establish Flexible Design Criteria
- Tool 11: Evaluate Flexible Financing
- Tool 12: Develop Finance Expenditure Model
- Tool 13: Establish Public Involvement Plans

C19 - Expediting Project Delivery

- Expediting Project Delivery identifies 24 strategies for addressing or avoiding 16 common constraints in order to speed delivery of transportation projects.
- Strategies Grouped Under Six Objectives:
  1. Improve internal communication and coordination;
  2. Streamline decision-making;
  3. Improve resource agency involvement and collaboration;
  4. Improve public involvement and support;
  5. Demonstrate real commitment to the project; and
  6. Coordinate work across phases of project delivery.

Expediting Project Delivery

Strategy	Stage of Project Planning or Delivery				
	Early Planning	Corridor Planning	NEPA	Design/ROW/ Permitting	Construction
1. Change-control practices			●	●	●
2. Consolidated decision council		○	●	●	
3. Context-sensitive design and solutions	○	○	●	●	○
4. Coordinated and responsive agency involvement	○	●	●	●	●
5. Dispute-resolution process		○	●	●	○
6. DOT-funded resource agency liaisons		○	●	●	
7. Early commitment of construction funding	●	●	●		
8. Expedited internal review and decision-making	●	●	●	●	
9. Facilitation to align expectations up front	○	●	●		
10. Highly responsive public engagement	●	●	●	●	○
11. Incentive payments to expedite relocations				●	
12. Media relations manager		●	●	●	○
13. Performance standards	○	●	●	●	
14. Planning and environmental linkages	●	●	●		
15. Planning-level environmental screening criteria	●	●			
16. Programmatic agreement for Section 106			●	●	
17. Programmatic or batched permitting			●	●	
18. Real-time collaborative interagency reviews	○	○	●	○	
19. Regional environmental analysis framework	○	●	●	●	
20. Risk management	●	●	●	●	●
21. Strategic oversight and readiness assessment	○	●	●		
22. Team co-location		○	●	●	
23. Tiered NEPA process	○	●	●		
24. Up-front environmental commitments		●	●	●	

SHRP2 on the Web

- **GoSHRP2**
  www.fhwa.dot.gov/GoSHRP2

  Apply for Implementation assistance

  Learn how practitioners are using SHRP2 products

- **SHRP2 @AASHTO**
  http://SHRP2.transportation.org

  Implementation information for AASHTO members

- **SHRP2 @TRB**
  www.TRB.org/SHRP2

  Research information

- **FHWA R10 & C19 Websites**
  https://www.fhwa.dot.gov/GoSHRP2/Solutions/Renewal/R10
- https://www.environment.fhwa.dot.gov/strmlng/shrp2-c19/default.asp

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Integrating SHRP2 Into NMDOT Projects

Parametrix

ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

BENEFITS of SHRP2?

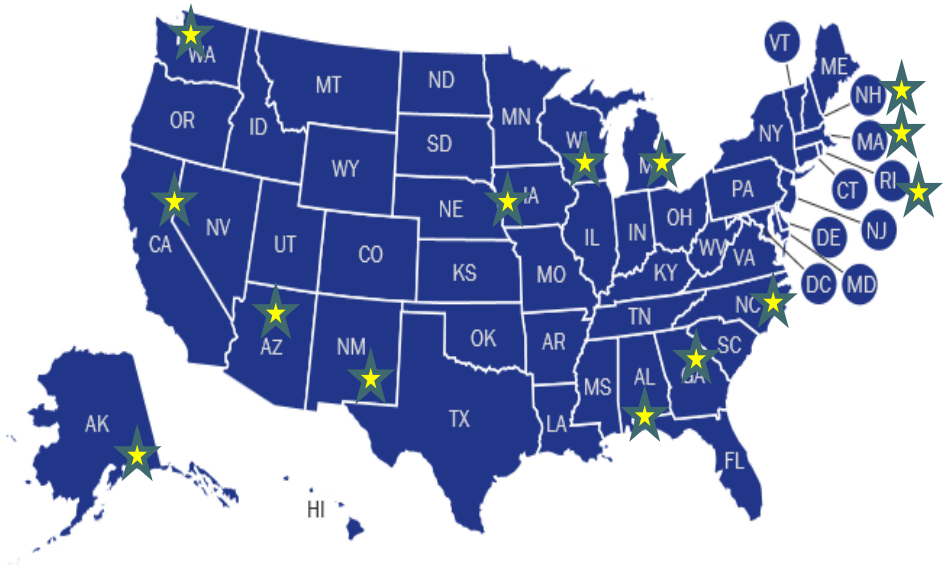
Benefits

- Early communication in the process
- Early identification of complexity based on needs of the specific project
- Early preparation of the financials, schedule, and resources
- Looking at context and financing as drivers of the project
- Earlier identification of critical success factors
- Creates a realistic balance between the available funding and scope
- Reduces uncertainties
- Develop project action plans and/or more defined scope report for success

HOW have other STATES incorporated SHRP2?

Round 1 Lead Adopter

- Federal Lands
- Georgia
- Massachusetts
- Michigan
- New Mexico



Round 4 User

- Alaska, Arizona, Iowa, New Hampshire, North Carolina, Washington, Wisconsin, Rhode Island

PROJECT DEFINITION

- Identify key project issues
- Dimension rank and rating
- Develop complexity map
- Follow-up questions
- Identify critical success factors
- Identify key team members
- Develop preliminary action plan

Project Definition – IDENTIFY Key TEAM Members

Project Team Member Analysis[1]

Team Member	Required? (yes or no)	In-House (i) or Consultant (c)
Public involvement officer		
Cost model expert		
Contract administration engineer		
Project Development Engineer		
Assistant District Engineer		
Design Project Manager		
Traffic engineer		
Geotechnical engineer		
Geologist		
Pavement engineer		
Utility coordinator		
Right-of-Way specialist		
Environmental specialist		
ADA coordinator		
Construction manager		
FHWA representatives		
Local jurisdiction representatives		
Consultant staff (specify)		
Other (specify)		

1 NMDOT developed this worksheet, which covers method 2, assemble the project team.

Project Definition – IDENTIFY Key Project ISSUES

- **Cost** – Factors that affect cost
- **Schedule** – Time requirements and constraints to achieve project delivery
- **Technical** – All technical aspects of a project, including engineering requirements
- **Context** – External factors that can impact a project
- **Financing** – How will the project be paid for, including constraints and timing of funding (cash flow)

Project Definition – IDENTIFY Key Project ISSUES

Exhibit PM-1

Project Issue Identification[1]

Cost Factors	Schedule Factors	Technical Factors	Context Factors		Financing Factors
• Contingency usage • Risk analysis • Estimate formation • Owner resource cost allocation • Cost control • Optimization's impact on project cost • Incentive usage • Material cost issues • User costs/benefits • Payment restrictions • Other (specify)	• Timeline requirements • Risk analysis • Milestones • Schedule control • Optimization's impact on project schedule • Resource availability • Scheduling system/software • Work breakdown structure • Earned value analysis • Other (specify)	• Project scope • Owner's internal structure • Bidder prequalification • Warranties • Disputes • Delivery methods • Contract formation • Design method • Reviews/analysis • Existing conditions • Construction quality • Safety/Health • Optimization's impact on construction quality • Typical climate • Technology use • Other (specify)	• Public • Political • Owner • Jurisdictions • Designer(s) • Maintaining capacity • Work zone visualization • Intermodal • Social equity • Demographics • Public emergency services • Land use impact • Growth inducement • Land acquisitions • Local economics • Marketing • Cultural impacts	• Local workforce • Utility coordination • Railroad coordination • Resource availability • Sustainability goals • Environmental limitations • Procedural law • Local acceptance • Global/national economics • Global/national incidents • Unexpected weather • Force majeure events • Other (specify)	• Legislative process • Uniformity restrictions • Transition to alternate funding sources • Project manager financial training • Federal funding • State funding • Bond funding • Borrowing against future funding • Advance construction • Revenue generation • Monetization of existing assets • Franchising • Public-private partnerships • Risk analysis • Financial management software • Other (specify)

1 Exhibit PM-1 was modified from the Guide to Project Management Strategies for Complex Projects.

Project Definition – IDENTIFY Key Project ISSUES

Create a statement explaining unique aspects of the project for:

- Cost
- Schedule
- Technical
- Context
- Financing

Project Definition – Dimension RANKING

Project Dimension Ranking

	1 (least complex)	2	3	4	5 (most complex)
Cost	☐	☐	☐	☐	☐
Schedule	☐	☐	☐	☐	☐
Technical	☐	☐	☐	☐	☐
Context	☐	☐	☐	☐	☐
Financing	☐	☐	☐	☐	☐

Project Definition – Dimension RATING

Dimension Rating Exercise

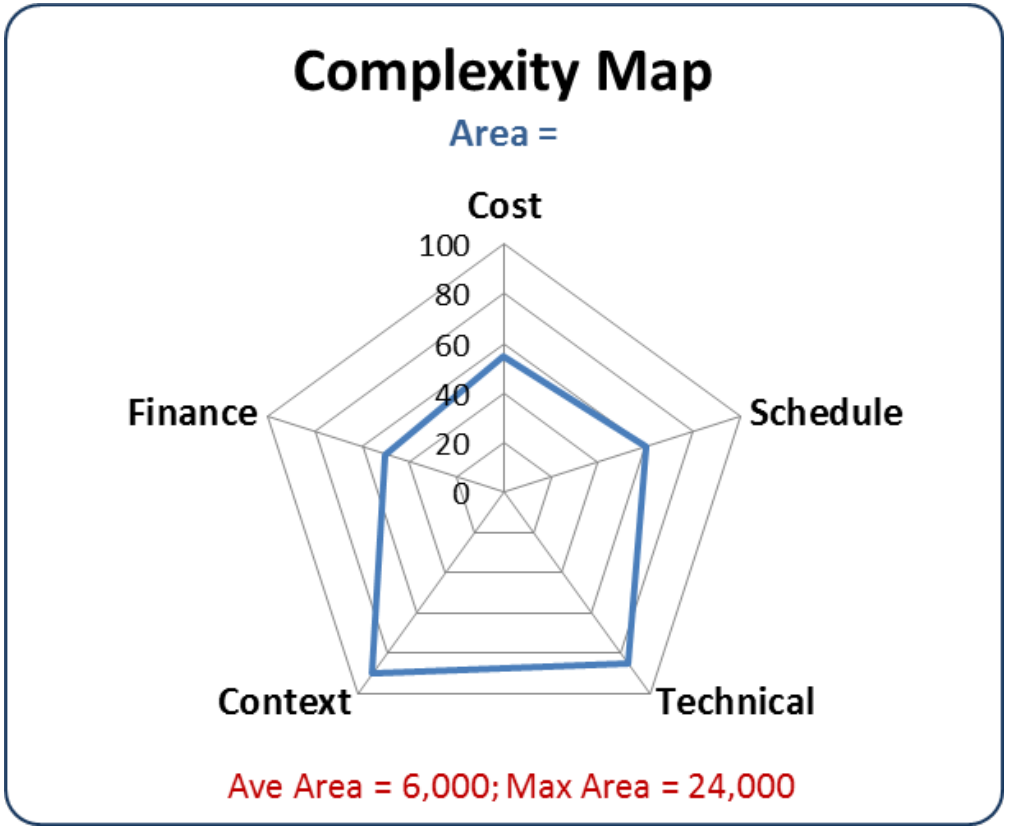
Dimension	Scale				
Cost Complexity	Minimal		Average		High
	0	25	50	75	100
Schedule Complexity	Minimal		Average		High
	0	25	50	75	100
Technical Complexity	Minimal		Average		High
	0	25	50	75	100
Context Complexity	Minimal		Average		High
	0	25	50	75	100
Financing Complexity	Minimal		Average		High
	0	25	50	75	100

Project Definition – COMPARE Ranks and Rating

Complexity Map Exercise – Comparing Ranks and Relative Score

Dimension	Rank	Rate/Relative Score
Cost	2	55
Schedule	3	60
Technical	4	85
Context	5	90
Financing	1	50

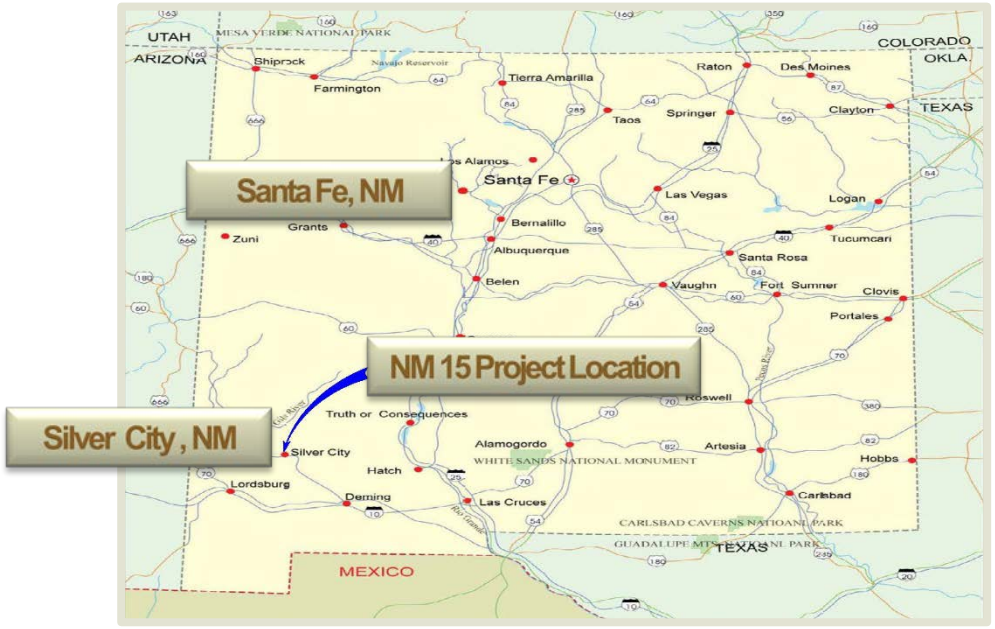
Project Definition – DEVELOP Complexity MAP



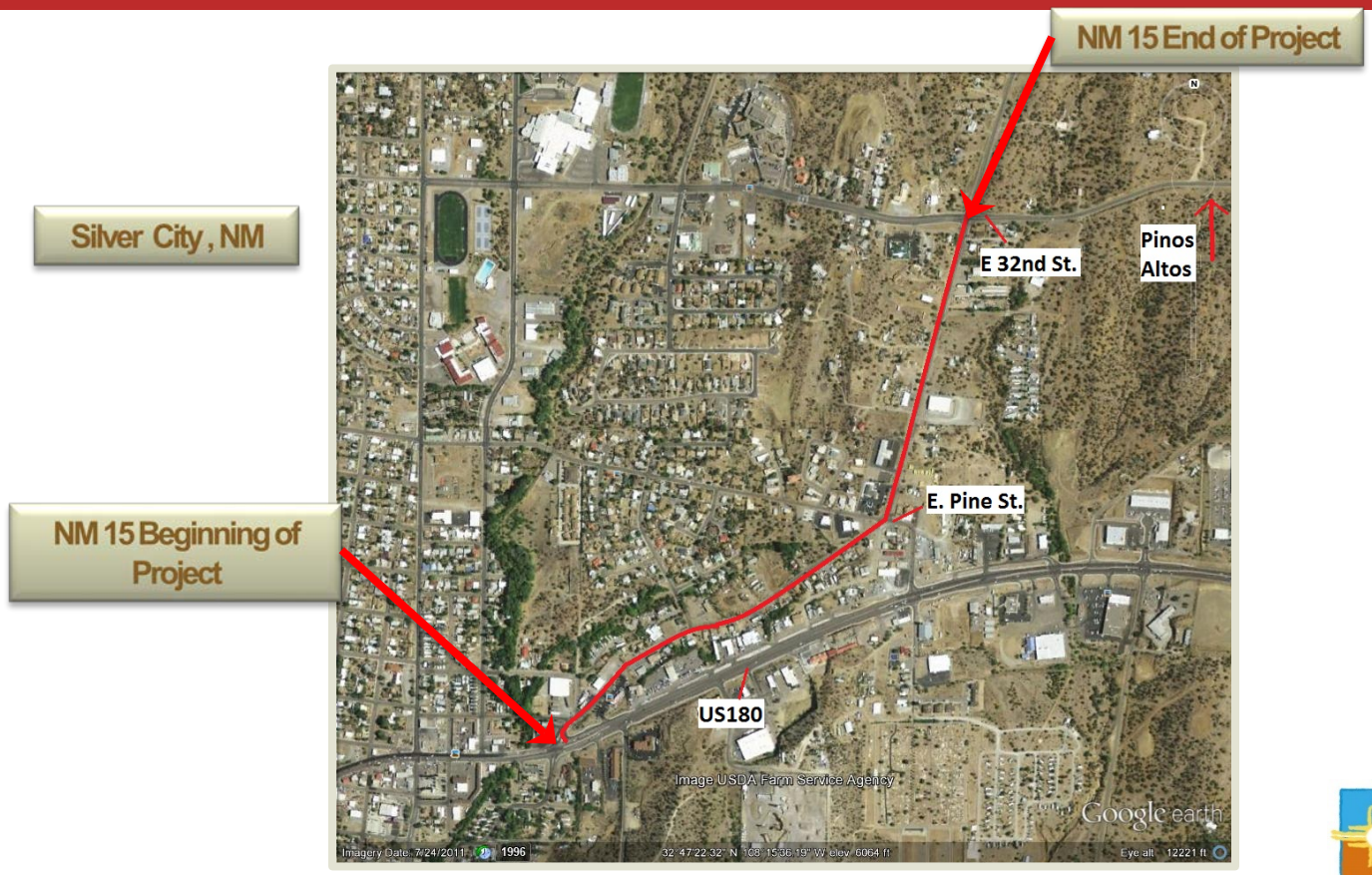
Project Definition – TOOLS/SOLUTIONS

1. Incentivize project outcomes
2. Develop dispute resolution plans
3. Perform risk analysis
4. Identify critical permit issues
5. Special environmental reports
6. Evaluate off-site fabrication
7. Determine involvement of right-of-way and utilities
8. Design to budget
9. Co-locate team
10. Establish flexible design criteria
11. Evaluate flexible financing
12. Develop finance expenditure model
13. Establish public involvement plans

Regional Map



Vicinity Map



Funding of the Project

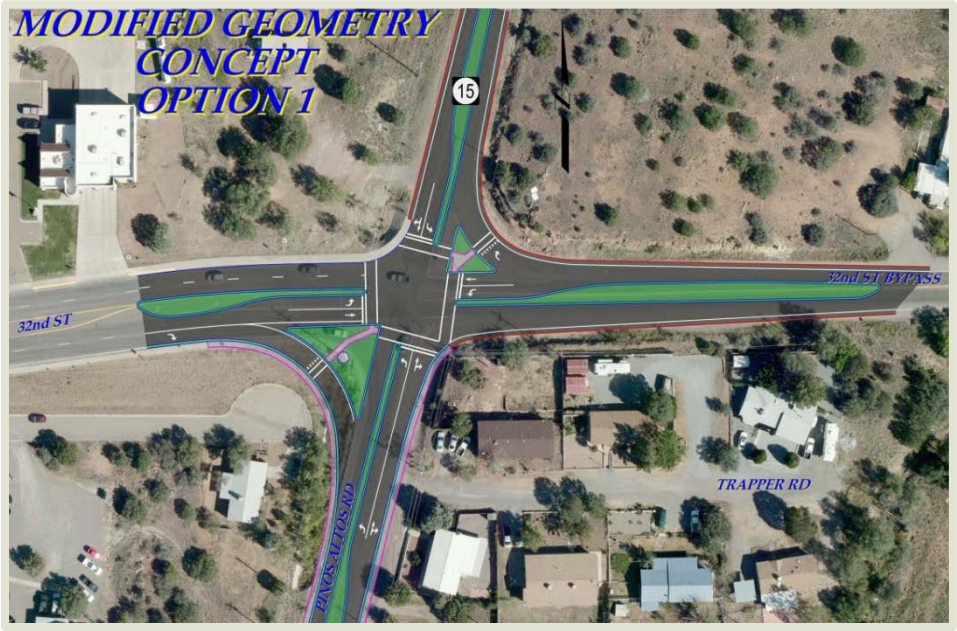
Funding $8 million

- Consists of construction, ROW, design/engineering, stipends, and construction management
- Risk in Cost
  - Rock Excavation
  - Lighting
  - Urban Design

Schedule

Schedule

- Environmental Process
- Right of Way
- Property Surveys
- Utility Relocations



Technical

Technical

- American with Disabilities Act
- Driveways
- Urban Section
- Limited Right of Way
- Maintenance of Traffic Contro
- Public Involvement

NORTH OF PINE STREET - OPTION 2 - PERSPECTIVE (LOOKING SOUTH)

Context

- Cycling Community
- Steep Slopes
- Utility Relocation
- Lighting Agreements

SOUTH OF PINE STREET - OPTION 2 - PERSPECTIVE (FACING SOUTH)

Financing

Financing

- State and Federal aid – highway funds
- Town of Silver City lack of necessary financing for lighting and utility relocations.

HOW has NMDOT incorporated SHRP2 to date?

NM 15 Silver City Project

Cost – Determined risk in cost was rock excavation, lighting, urban design.

Schedule – Determined that right of way and utility relocation will affect schedule.

Financing – Town of Silver City lacks necessary funds for lighting and utility relocations.

Context – Cycling community, steep slopes, utility relocation, public involvement

Technical – ADA, urban section, limited right of way

Note: This project's estimate is about $8 million.

HOW is NMDOT integrating SHRP2?

- Integrating specific aspects of SHRP2 that will apply to most NMDOT projects
- Most of the work will occur during project definition
- Pavement preservation projects will not be required to complete the SHRP2 elements that have been integrated into project development
- Other NMDOT projects, including rehabilitation, reconstruction, new construction, and all consultant-led projects will require SHRP2 documentation

HOW is NMDOT integrating SHRP2?

Updating our project development process

- Project Definition
  - Determine project complexities
  - Identify project challenges and success factors
  - Identify key team members
  - Develop a preliminary action plan
- Project Scoping and Conceptual Design
  - Update complexity map
  - Update the project action plan
  - Optional exercises to help with cost and financing issues
- Preliminary Design
  - Update complexity map
  - Update the project action plan
  - Optional exercises to help with cost and financing issues

Project Definition – Complexity Map FOLLOW-UP Questions

1. How are you going to address your most complex dimension?
2. What resource allocation issues need to be addressed as part of project planning for each dimension?
3. When are you going to address these complexity factors?

Project Definition – RFP vs. INTERNAL DESIGN Projects

- For projects involving RFP development for consultants, this up front work should help form the basis of the consultant RFP.
  - Consultants have indicated that the preliminary action plan and complexity map would be helpful for them to see in an RFP
  - The goal would be to improve the RFP process for both NMDOT and consultants.
- For internal design projects, this upfront work will help to develop a solid scope of work. The intent of the work is to minimize scope creep as the project progresses.
- Documentation becomes part of the project file.

Lesson Learned

Small Project

- Currently utilizing most of the items in daily design development process.
- Small complex project – IT WORKS TO GET THE COMMUNICATION ON THE PROJECT STARTED.
- Method works great on design build projects.
- Great Process for Young Project Development Engineers

C19: Expediting Project Delivery

SHRP2 C19 Expediting Project Delivery – VTrans Accelerated Bridge Program

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November 15, 2017

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VTrans

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Accelerated Bridge Program (ABP)

- ABP Created in 2012
- Reorganized into two new sections
  - Accelerated Bridge Program (ABP)
  - Project Initiation and Innovation Team (PIIT)

Accelerated Bridge Program (ABP)

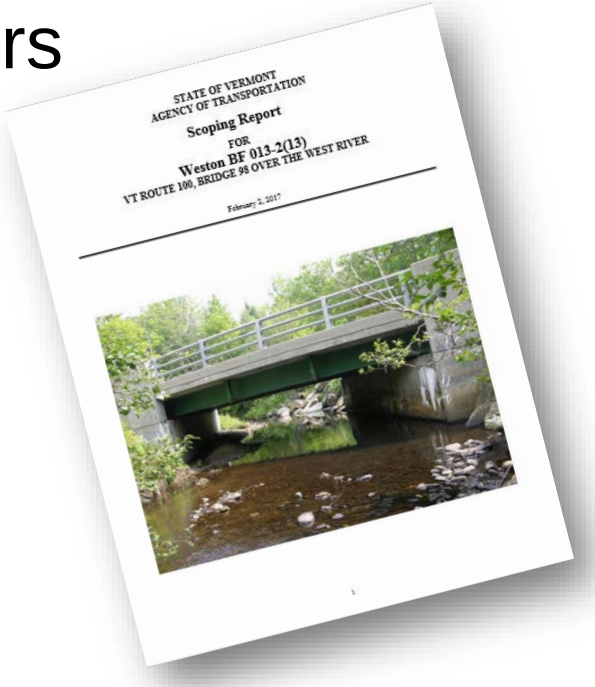
- Programmatic approach to accelerating projects
- Project Delivery 24 months from Project Defined to Bid Advertisement
- Programmatic use of ABC
- Initial goal of 25% of all bridge projects

ABP Implementation

- Early Project Coordination
  - Public outreach
  - Contractor Input
  - Internal and External Stakeholders
- Streamline/expedite the project delivery process
  - Maximize flexibility in rules and process
  - Evaluate risk but run concurrent activities
- Develop and use standard details for ABC
- Design projects to be successful for ABC

Project Initiation & Innovation Team (PIIT)

- Dedicated team of scoping Engineers and Technicians
- All bridge projects start here
- Approximately 20-30 projects initiated and scoped per year
- Heavy emphasis on collaboration
- Public Engagement in Process
- ABC option is always first consideration.


STATE OF VERMONT
AGENCY OF TRANSPORTATION
Scoping Report
FOR
Weston BF 013-2(13)
VT ROUTE 100, BRIDGE 98 OVER THE WEST RIVER
February 2, 2017

SHRP2 SOLUTIONS

TOOLS FOR THE ROAD AHEAD

SHRP2 C19

Leveraging Strategies to Remove Impediments and Deliver Projects

SHRP2 C19

- In 2012, SHRP2 published a report entitled, “Expedited Planning and Environmental Review of Highway Projects.”
  - 16 Constraints
  - 24 Strategies

SHRP2 C19

- In October 2013, VTrans was selected as a Lead Adopter of SHRP2 C19.
- Program Assessment of Project Delivery
  - Leadership
  - Data management
  - Scoping
  - Design
  - Resources
  - Public Outreach
- Development of Action Plan
- Implementation of Action Items
- Final Report of Experience

5 Key Strategies for Expediting Project Delivery

- **Strategy 3**: Context Sensitive Design/Solutions
- **Strategy 8**: Expediting Internal Review and Decision Making
- **Strategy 10**: Highly Responsive Public Engagement
- **Strategy 21**: Strategic Oversight and Readiness Assessment
- **Strategy 22**: Team Co-Location

C19 Desired Outcomes

- Evaluate risks to timely project delivery
- Identify opportunities to expediting projects with special emphasis on the strategies described in the *Expediting Project Delivery* report
- Identify resource demands for the ABP and how this may differ from conventional project delivery
- Analyze the VTrans organizational structure for opportunities for increased efficiencies
- Identify potential process improvements
- Build relationships with internal and external partners

C19 Action Plan Drawing Upon Key Strategies

Strategy 3: Context Sensitive Design Solutions

Objective: Improve public involvement and support

- Enhanced project scoping in the PIIT
- Community and Operations Questionnaires
- Addition of “Collaboration Phase” during project definition
- Proper Selection of selected alternatives (avoidance, minimization, and mitigation)

Strategy 8: Expediting Internal Review and Decision Making

Objective: Streamline decision making

- Batching of scoping projects for resource ID
- Heightened Communication and Collaboration
  - Collaboration Phase During Project Definition
  - Team Meetings
  - Constructability Review Meetings
  - Pre-closure Contractor Meeting
- Concurrent Activities and Decision Tree

Strategy 10: Highly Responsive Public Engagement

Objective: Improve public involvement and support

- Providing Financial Incentives on TH Projects (ACT 153)
- Public Meetings throughout the life of the project
- Effective Public Engagement
  - Audience Response Systems
- Public Involvement Plans
- Project Outreach Coordinators
- Customer Satisfaction Surveys

Strategy 21: Strategic Oversight and Readiness Assessment

Objective: Improve internal communication and coordination

- Creating a Culture that Values Innovation
- Strong and Effective Project Management
- Developing Key Planning Documents
  - Traffic Management Plans
  - Public Involvement Plans
  - Risk Registry
  - Credible Schedules and Spending Profiles
- Standardized Design Details

Strategy 22: Team Co-Location

Objective: Improve internal communication and coordination

- Resource Groups Housed Together
- Dedicated Utility Relocation Specialists
- Project Development Team Meetings
- Constructability Review Meetings

C19 Peer Exchanges

- Peer Exchanges with MassDOT, NYSDOT and MaineDOT
  - Project teams from VTrans in Attendance
  - Program Overviews
  - Accelerated Program Emphasis Areas
  - Shared New Initiatives, Innovations, and Lessons Learned

- Numerous Takeaways from the Program/Process Review, Peer to Peer Exchanges, and Stakeholder Interviews

Peer to Peer Exchanges

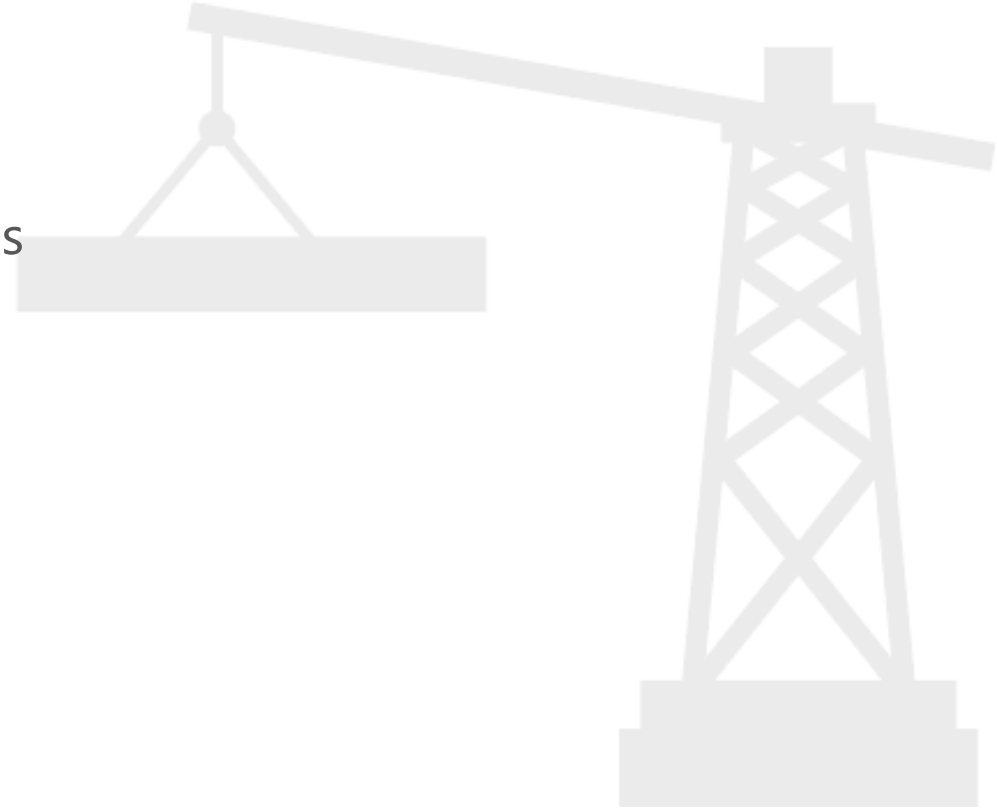
NYS DOT

September 22 and 23, 2015

Our C19 Journey Has Just Begun

- Explore Enhancements in the PIIT process
  - Leverage expertise in VTrans to help refine recommended alternatives
  - Develop truncated scoping report for Preventative Maintenance and Emergency Projects
  - Explore effective methods to engage upper lever management on high risk and high cost projects
  - Develop prescreening GIS tool for resource ID

ABC Performance



54 ABC projects

Delivered from 2012 to date, which is

50% of all Projects

Representing

$84 Million

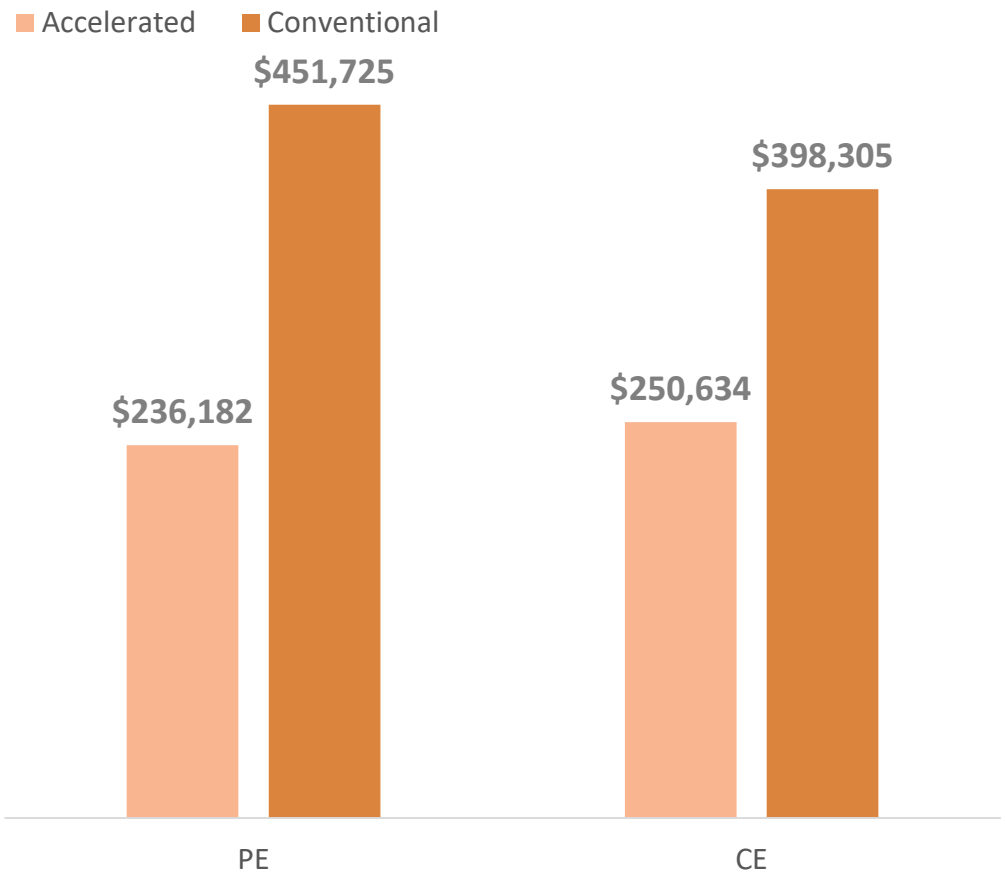
Construction costs

100%

New Bridges Opened on Time

ABP –Engineering Costs

BRIDGE PROJECT AVERAGES

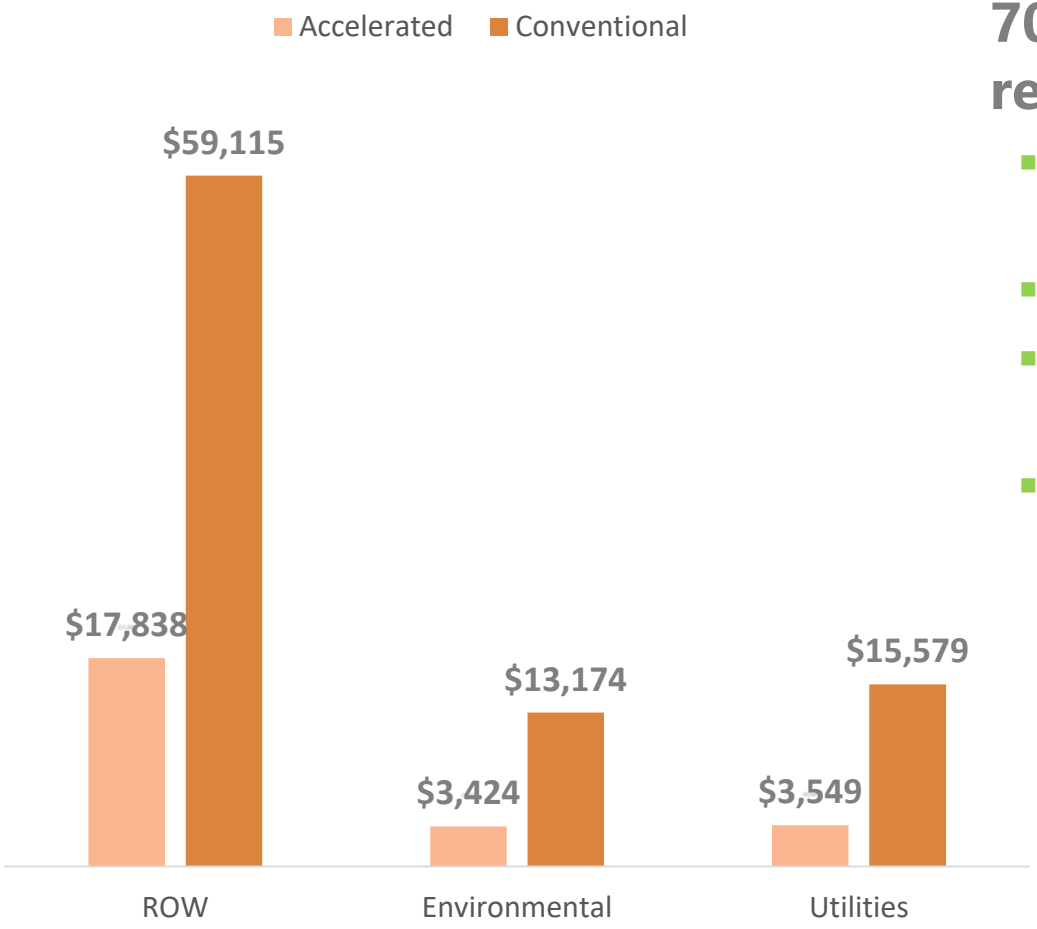


40% savings in Engineering costs

- ABC Standardized approach
- Shorter duration design process = Preliminary Engineering (PE) Savings
- ABC = Shorter Construction Durations and Construction Engineering (CE) Savings

ABP –Resource Demands

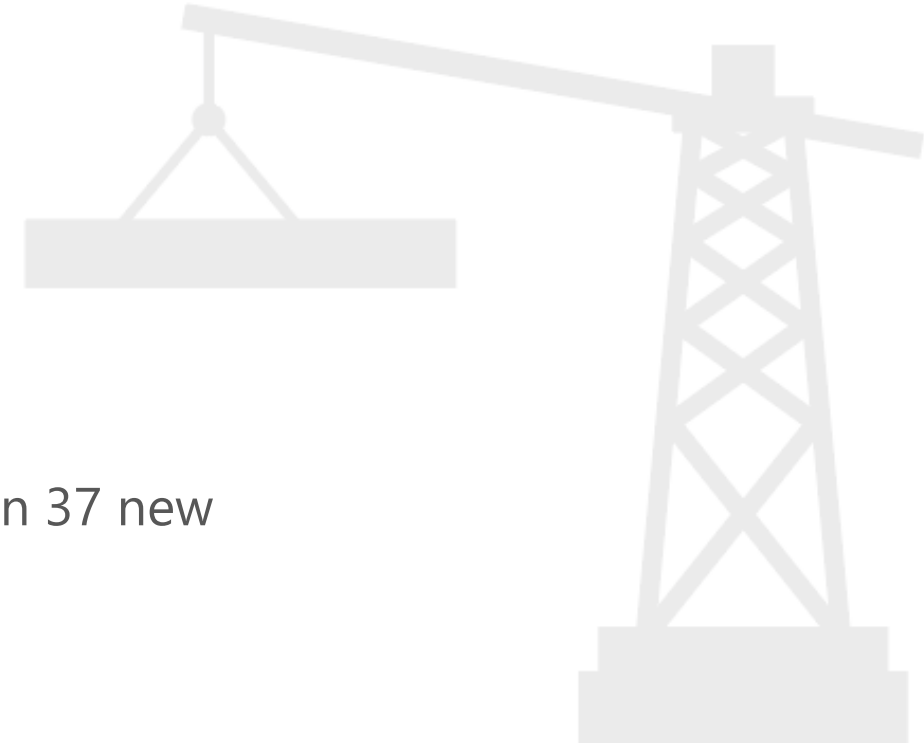
BRIDGE PROJECT AVERAGES



70-75% savings in resource demands

- ABC = Less impact to existing Utilities
- ABC = Less ROW impacts
- ABC = Less Environmental impacts
- Team Co-organization and Co-location efficiencies

ABC Construction Savings



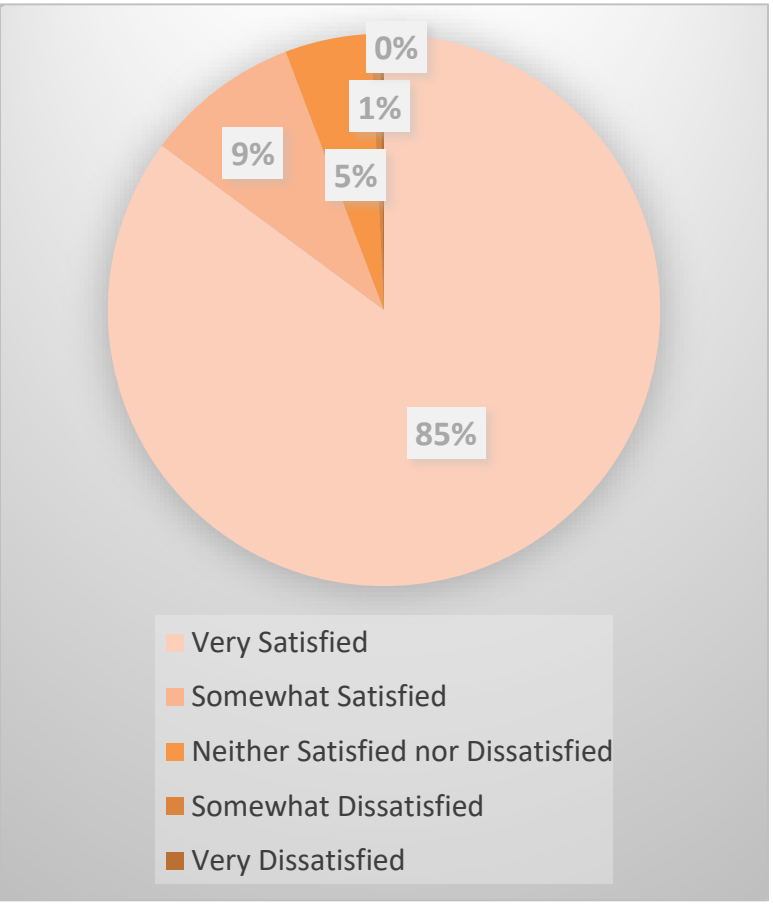
18% Savings

ABC vs Conventional Projects based on 37 new projects

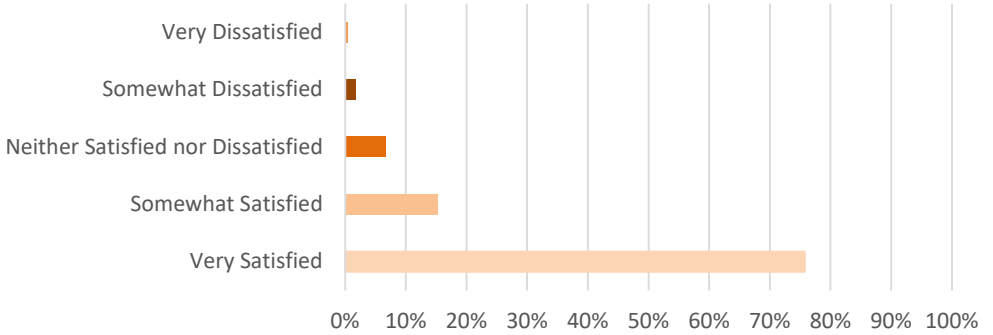
Customer Survey Results

- How satisfied were you with ABC?

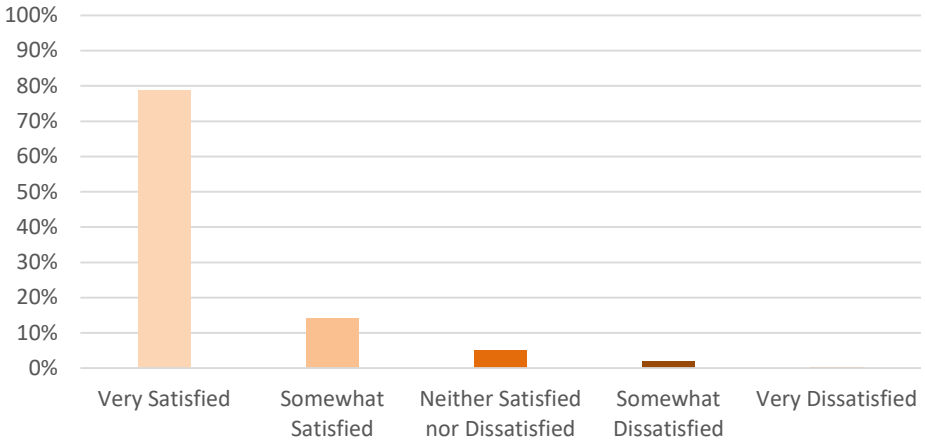
397 Responses from 9 2015 projects



- How satisfied are you with the information you received about the bridge project?



- Overall, how satisfied were you with how VTrans delivered this project?



Want to Know More…

- Final Report Completed in September 2017
  - *http://vtrans.vermont.gov/sites/aot/files/portal/documents/other/SHRP2%20C19%20Final%20Report%20-%20Expediting%20Project%20Delivery.pdf*
- VTrans Public Involvement Guide
  - *http://vtrans.vermont.gov/sites/aot/files/highway/documents/publications/VTransPublicInvolvementGuide2017.pdf*
- Project Case Study Sheet
- Contact Us

Thank You

Questions?

Please remember to type in your questions to the question prompt.

Thank you for participating!

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