Communicating Railroad–DOT Mitigation Strategies

DETAILS

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Communicating Railroad–DOT Mitigation Strategies

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Executive Summary

Any activity involving a highway project that interacts with railroad rights-of-way requires that the two parties enact a legal agreement to enable payment for services rendered or work done and ensure the safety of the public and personnel working on the project, the efficiency of the railroad, and the financial interests of the highway agency. Inefficiencies in processing these agreements can result in delayed project delivery or increased costs. The railroads and transportation agencies also face challenges in the planning, design, construction, and maintenance phases of projects that can adversely affect schedule, cost, or scope of projects.

An earlier second Strategic Highway Research Program (SHRP 2) project called Strategies for Improving the Project Agreement Process Between Agencies and Railroads, completed in 2009 and referred to in this report as the Railroad–DOT Mitigation Strategies project, had identified best practices that address many of the common challenges faced on projects involving road and rail. These practices generally have been developed between states and railroads in isolation. A collaborative forum to share these successful practices and promote them as standard practices nationally would benefit other peer transportation agencies and railroads facing similar challenges.

The SHRP 2 R16A project, referred to as the communication and dissemination project, was tasked with setting up the collaborative forum and starting the initial dissemination of the research best practices. To ensure success of the dissemination, the StarIsis team created a community of stakeholders: the community of interest (COI), consisting of four of the nation's largest Class I railroads, one short line railroad, eight U.S. state transportation agencies, one Canadian transportation agency, and two federal agencies.

Some of the organizations had multiple members participate in the COI meetings. The members included Norfolk Southern Railway (NS), Burlington Northern Santa Fe Railway (BNSF), CSX Railroad (CSX) , Union Pacific Railroad (UP), and Genesee & Wyoming (G&W) railroad; departments of transportation (DOTs) from Texas, Florida, Washington, Illinois, North Carolina, Michigan, Pennsylvania, and Iowa; Manitoba Infrastructure and Transportation (MIT); the Federal Highway Administration (FHWA); and the Federal Railroad Administration (FRA). The project team worked with this community of interest to set the stage for collaborative discussions on the adoption of the best practices and innovations referred to in the report as project innovations.

Four meetings of the COI were held. These served as excellent forums for members to brainstorm on the usefulness of the project innovations in addressing the common challenges they faced on projects involving transportation agencies and railroads. The StarIsis team also held many one-on-one discussions with COI members before and after each COI meeting as well as one-on-one discussions for updates on various member activities throughout the duration of the project. The COI was also engaged in the national dissemination of information relating to the project innovations at various national conferences. The project team was able to successfully address the early skepticism among some members about successfully achieving the objectives

of the national dissemination. The project team was thus able to create a collaborative environment and productively engage the COI members to start the process of adopting several of the project innovations. The team also successfully engaged members to participate in the dissemination of the project innovations at various national forums.

The collaborative environment established in the project exceeded the expectations of the COI members. Participation resulted in members' championing of the dissemination and adoption of several of the project innovations. For example, while the project required only four national dissemination efforts, the member involvement resulted in ten dissemination sessions with two more scheduled for the summer of 2014.The engagement of members reflected their interest in and support of the project's objectives.

The COI is a good representative sample of states and railroads. The activities of this communication and dissemination project have set the stage for national dissemination and adoption of the project innovations.

Members note that with railroads in a growth phase and the highway network continuing to grow, the interactions between the two organizations on projects will only continue to increase. Also, new challenges are expected to arise on projects involving the two parties. With this first-of-a-kind successful community established, members have strongly recommended that the community of interest be supported and sustained in a similar collaborative environment for ongoing successful resolution of challenges.

Mr. David Wyatt, Senior Project Engineer from Norfolk Southern, responded to the success of the COI by stating that "The team, with the appropriate dissemination efforts and tools, has the potential to catalyze an expedited dissemination of the ready-to-implement project innovations on a national scale—all of which have successfully demonstrated their ability to shorten project delivery times, reduce project costs, streamline processes, improve efficiency and safety, reduce delays and inconvenience in traffic and freight movement, and, overall, reduce potential liability."

The project has set the stage for national deployment. The successful national adoption of the project innovations can help both parties work collaboratively to implement win-win strategies that address project challenges. The approach and framework adopted for this project can be successfully used and scaled up to facilitate the national deployment and adoption of the project innovations to effectively and proactively address common challenges. This will take the use of the innovations beyond the tipping point and make their use routine, resulting in streamlining project activities and minimizing schedule delays and cost overruns on projects involving transportation agencies and railroads. The process of sharing these innovations with local agencies has also begun. The support for deployment at the local level can be a subsequent phase of the deployment effort.

The report presents strategies for sustaining and expanding the activities of the COI within the current collaborative environment, along with the expansion of its activities to regional and local levels. It is strongly recommended that necessary funding be provided to sustain the COI and manage its activities successfully.

The report also discusses the barriers to deployment and key lessons learned that can help the national deployment and adoption of project innovations and continue the collaboration and communication necessary for ongoing resolution of challenges.

CHAPTER 1
Project Background

Numerous roadways and railways that are a part of the vast national transportation network cross or abut each other or their respective rights-of-way. The successful construction, operation, maintenance, reconstruction, and rehabilitation of these assets involve a high level of interaction between the transportation agencies that build and maintain the roads as well as the nation's railroad companies. According to the *2013 Report Card for America's Infrastructure* by the American Society of Civil Engineers (ASCE),

> "In total, one in nine of the nation's bridges are rated as structurally deficient, while the average age of the nation's 607,380 bridges is currently 42 years. The Federal Highway Administration (FHWA) estimates that to eliminate the nation's bridge deficient backlog by 2028, we would need to invest $20.5 billion annually, while only $12.8 billion is being spent currently. The challenge for federal, state, and local governments is to increase bridge investments by $8 billion annually to address the identified $76 billion in needs for deficient bridges across the United States (ASCE 2013)."

Apart from regular inspection and maintenance activities, the aging of the nation's roadway infrastructure will necessitate some level of reconstruction and rehabilitation on a majority of these roadways. Further, many of the railroad companies in the United States are currently expanding their activities, resulting in the initiation of new railroad projects. This increase in project activity will mean an increase in project reviews, whether they be railroad companies reviewing transportation agency projects or vice versa, resulting in an increased level of interaction between the two parties for the foreseeable future.

Historically, the interaction between transportation agencies and railroads involved many common challenges that affected project completion timelines and costs. Research completed in 2009 under the SHRP 2 Railroad–DOT Mitigation Strategies project (the initial research project) identified several innovations and best practices that would mitigate these challenges. The findings of the research effort were published in the 2010 SHRP 2 Renewal research report titled *Strategies for Improving the Project Agreement Process Between Highway Agencies and Railroads.* The report documented many successfully implemented best practices and innovative solutions (albeit in isolated pockets across the country) along with fresh ideas for the application of innovations to improve the collaboration between transportation agencies and railroads. These innovations, which have been used by peers, are excellent examples that can be used nationally to mitigate challenges on projects involving roadways and rail. The best practices and innovations identified in the initial research and in this dissemination and communication project are referred to in the report as project innovations.

The second phase of the SHRP 2 Railroad–DOT Mitigation Strategies research effort involved the communication and dissemination of information relating to these innovations to a

nationwide audience. The focus of this 2011 SHRP 2 project entitled *Communicating Railroad–DOT Mitigation Strategies*, referred to as the communication and dissemination project, was to start the communication and discussions about these successful strategies nationally, and, based on that experience, to recommend an implementation plan that could sustain and continue the effort. The long-term objective of the communication and dissemination project is to catalyze the adoption of these successful strategies by both parties (railroads and transportation agencies).

CHAPTER 2
Project Objectives

The primary objective of this (2011–2014) communication and dissemination project is to take the isolated successes documented in the 2010 research report and disseminate them for nationwide adoption. This objective was to be achieved through creating and engaging a community of interested stakeholders to share best practices. The expectation was that these meetings would engage the members and interest them to be willing to champion and pilot these innovative practices.

The stated project objectives were to

- Create, establish, and maintain a joint committee or community of interest to share best practices and distribute model processes.
- Identify and recruit "champion-pairings" (at least one state DOT and one Class I/II railroad pairing) to apply and pilot test the results of the Railroad–DOT Mitigation Strategies project.

During the course of the project, as a result of the team's efforts and based on the approach used, the project achieved a further outcome:

- Create an initial nationwide implementation structure to spread the innovations of the project to all 50 U.S. states and to several major cities. The intent of the structure was to support the creation of a critical mass of early adopters necessary for the project processes to continue spreading into common U.S. practice.

A key deliverable of the communication and dissemination project, documented in this report, is an implementation plan that will ensure the long-term sustainability of the community of interest.

CHAPTER 3
Summary of Initial Research Findings

All projects between transportation agencies and railroads that necessitate access to railroad property, expansion into or over transportation agency right-of-way for railroad projects, or incurring or reimbursing of costs, will require some type of agreements between the two parties. Depending on the project, this can mean extensive coordination, approvals, and signoffs from multiple levels within both organizations. Also, depending on the type of project, the coordination can start from the planning phase and continue through design and construction and into the maintenance of the project. Delays at various points in the process can result in increased project costs, adverse impacts to road traffic and rail freight movements, inconvenience to the traveling public, delayed project delivery, safety issues, and, in the case of the railroad companies, potential loss of profits and increased liability.

The initial research project included a survey and follow-up meetings to obtain feedback from railroads and local, state, and federal transportation agencies. This research revealed that challenges faced on projects involving transportation agencies and railroads were commonly attributable to the following factors:

- Delays in agreement processing;
- Nonstandard agreement, resulting in each agreement going through extensive reviews;
- Delays in coordination;
- Transportation agency designs not meeting railroad requirements;
- Insufficient insurance limits;
- Communication issues;
- Failure to anticipate and address construction issues;
- Limited understanding of the differences in objectives, cultures, and operational models;
- Inefficient workflow and duplications in workflow activities;
- Delays in authorizing work and in making payments;
- Strategies used often did not benefit both parties;
- Differences in institutional priorities;
- No shared interest;
- Railroads being very risk-averse; and
- Transportation agencies being cautious about spending taxpayer monies and concerns about public opinion.

Further, it revealed that the goals, priorities, responsibilities, and perspectives of both organizations are very different, resulting in differences in approach to dealing with such projects. Addressing these different perspectives and objectives is essential to developing

solutions for delivering projects that involve both parties, keeping them on schedule and within cost and scope.

Lessons learned from the initial research effort showed that positive engagement and collaboration of both parties is very important to address the challenges faced by either. Also, it was evident that partnering will be necessary to streamline the entire process, create win-win solutions, and sustainably address challenges in the long term.

The initial research project also found that solutions to several of the above listed challenges had been successfully implemented in isolated pockets across the country. The 2011 communication and dissemination project documented in this report looked at strategies to take these isolated successful innovative solutions, enhance them where appropriate, and disseminate the information more widely.

The project team recognized that the dissemination of innovations needed to be done carefully. The stakeholders noted that a marketing blitz might not be the best strategy for this project, because it might disseminate the information without resulting in meaningful progress in addressing the core problem. This could result in insufficient collaboration between the agency and railroad stakeholders, collaboration that is necessary for national adoption of innovations.

The team found that an approach that involved the stakeholders working collaboratively would be a more effective way of productively communicating the message, while also positively influencing and triggering the adoption of the innovative practices. It was also felt that any successful strategy for dissemination needed to trigger a willingness among other transportation agency and railroad pairs to try the project innovations and best practices in their environments. Thus, successful widespread acceptance needed the collaborative involvement of both the railroads and transportation agencies.

CHAPTER 4
Project Approach

The project team had encountered early skepticism about successfully achieving the project objectives and a resultant resistance from stakeholders during the initial research project, the skepticism being understandable based on the contentious nature of historical relationships between some transportation agencies and railroads. During the course of the research project, the project team worked closely with members of several Class I railroads and state transportation agencies. Team members also completed extensive research, conducted surveys, and held multiple meetings to understand the challenges as well as the background to the workings between the two parties. Over the research period, with good project management, constant communication, a balanced perspective, and quality deliverables, team members developed a good professional relationship with many of the stakeholders. Team members also recognized, among the stakeholders, the need and desire (and of course, the constraints) for establishing a cooperative environment which could lead to long-term, sustainable solutions for expediting the delivery of railroad–DOT projects.

This allowed team members to implement a strategy to effectuate significant progress toward establishing the spirit of cooperation. During the communication and dissemination project, the team implemented an approach to build on the trust and collaboration that had been initiated earlier. Members for the project's community of interest and champion-pairs were recruited in such a manner as to facilitate the long-term success of the project objectives.

The approach was thus to create an environment where the members of the community of interest benefitted from the discussions, were vested in the success of the project, and became initial champions who were willing to implement the various innovations. Through the process of communicating the details of the innovations, together with support from the COI members at various national and regional forums, the StarIsis team sought to expand the list of stakeholders to champion the implementation of various project innovations.

The innovation adoption process model shown in Figure 4.1 identifies the successful national adoption of innovations occurring when between 10 to 15 percent of users adopt the innovation. This is also referred to as the tipping point. The project team worked collaboratively with the COI to initiate the next steps and move the testing and adoption of project innovations from innovators to the tipping point.

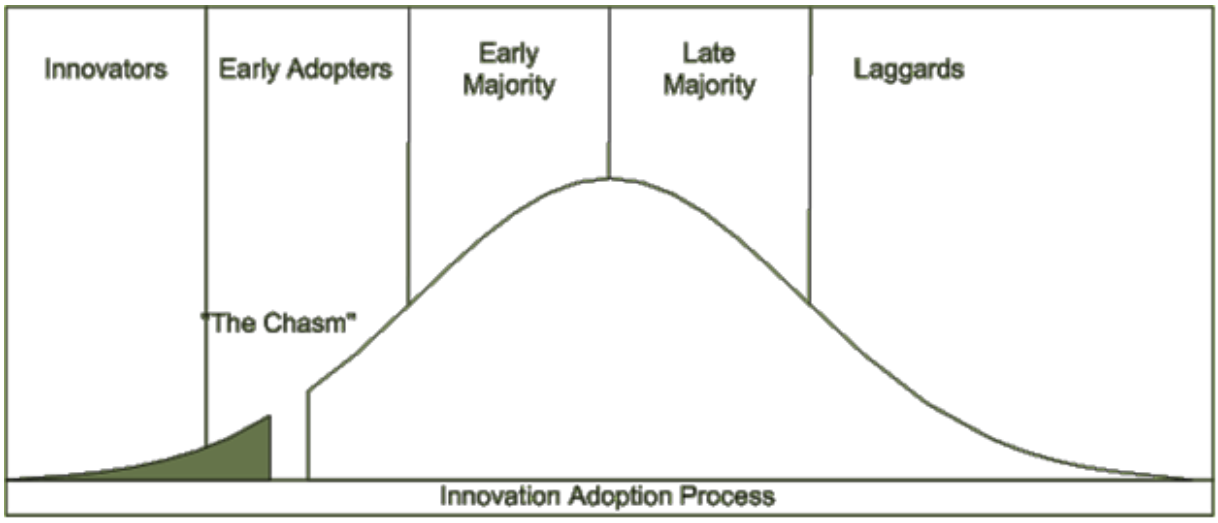

Figure 4.1. Innovation adoption process model.

By creating an environment conducive for discussions, the team engaged the COI to champion the dissemination and to use several of the project innovations. The collaboration resulted in the COI stakeholders advocating the adoption of the innovations to peers. The COI members also got the project discussion on the agenda of various conferences and meetings.

This report discusses the strategies that were successfully used and the framework that was created in collaboration with this first-of-its-kind community of stakeholders. The report recommends a framework to catalyze widespread adoption of the innovations nationally. Additionally, since local agencies work closely with state agencies on railroad projects, the success at the state level can also be replicated to address the challenges of local agency rail projects. This would mean the adoption of the innovations by multiple tiers at state and local levels nationally.

CHAPTER 5
Milestone Activities

5.1 Creation of the Community of Interest

The discussions with stakeholders from both transportation agencies and railroads had revealed that there were many obstacles to the adoption of the innovations. One primary factor involved the differences in the cultures and objectives of both organizations. The objectives of transportation agencies as public entities responsible to the taxpayers are different from those of a private, for-profit company with responsibilities to its shareholders. Having previously encountered challenges with coordination and communication on projects, both sides were skeptical about working together to successfully implement the innovations. There were also concerns of failure and of the high cost and time that would be required for the implementation. Proactively addressing these obstacles, the project team worked to make sure that an environment conducive for productive and collaborative discussions and for brainstorming and thinking outside the box was created. The many factors considered in recruiting members from transportation agencies and railroad companies to join the COI included

- Ensuring that the COI discussion environment was conducive to facilitating the dissemination of the innovations and best practices;
- Setting up an environment for future widespread dissemination;
- Seeking members representing different regions of the country, so as to ensure that differences in expectations of transportation agencies and railroads associated with factors such as terrain, environment, weather and other regional factors were accounted for;
- Having transportation agencies and railroad representatives on the COI who are familiar with or who had worked on projects involving road and rail projects, and preferably members who had interacted with each other on projects;
- Having members who could promote ideas both horizontally as well as vertically across both organizations; and
- Recognizing that both DOTs and railroads are short staffed and that key staff members from both organizations are pressed for time, provide the necessary support to members to ensure that their time is devoted to the significant tasks of learning from COI peers, disseminating the benefits of the best practices and project innovations, and of championing them.

Taking the adoption of innovations to address common challenges beyond the tipping point would make their use routine with assured potential for widespread adoption. In selecting members to the COI, the project team focused on having adequate representation of stakeholders

from appropriate organizations that could, in the long term, facilitate taking the adoption of the innovations beyond the tipping point.

Because the majority of the road and rail projects involved the Class I railroads, the team also wanted to make sure that the COI had representation from at least 70 percent of the Class I railroads.

The team successfully recruited representatives from CSX, Burlington Northern Santa Fe Railway (BNSF,) Union Pacific Railroad (UP), and Norfolk Southern Railway (NS), covering over 90 percent of Class I railroad freight movement (as shown in Figure 5.1), and representatives from Genesee & Wyoming, the largest of the short line railroads (to represent that segment of the railroad community).

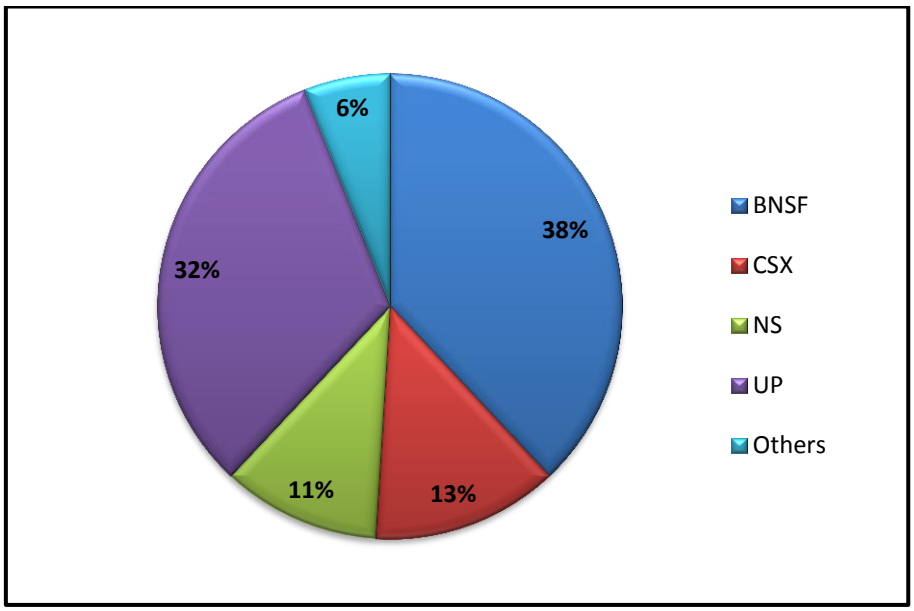

Figure 5.1. Distribution of freight movement by railroads.

To ensure national representation from transportation agencies, the team engaged representatives from state DOTs to cover all four regions of the American Association of State Highway and Transportation Officials (AASHTO) shown in Figure 5.2.

Representing the AASHTO regions are eight state DOTs as follows:

Region 1. Pennsylvania
Region 2. Florida and North Carolina
Region 3. Illinois, Iowa, and Michigan
Region 4. Texas and Washington

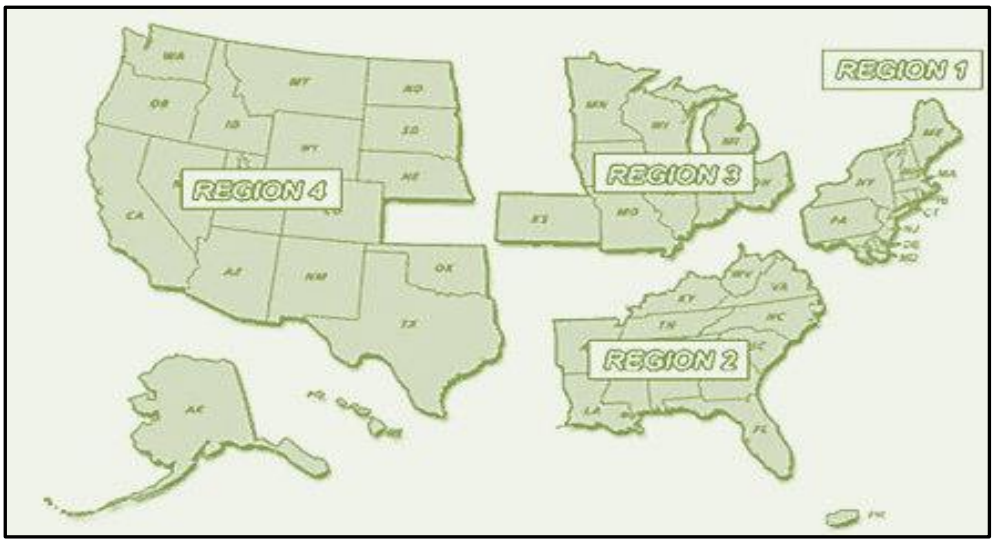

Figure 5.2. The four AASHTO regions.

Manitoba Infrastructure and Transportation, the Canadian province of Manitoba's agency equivalent to a state's DOT transportation agency, was included to provide an international perspective. Representatives from Federal Highway Administration (FHWA) and FRA (Federal Railroad Administration) were also engaged as COI members.

The outcome of this deliberate approach to recruiting members was the creation of a very collaborative and productive community of interest of stakeholders. This community of interest was the first such forum that provided a non-threatening environment for facilitated and open discussions between the stakeholders. The meetings that followed were set up to create an environment conducive for members to collaborate and discuss challenges more openly and to brainstorm ideas and potential solutions. Members felt comfortable to think creatively, share new ideas, ask questions, and brainstorm solutions without fear of any repercussions.

5.2 The Role of the COI

A facilitated discussion was conducted during the COI kickoff meeting in Kansas City, Missouri. After deliberations, the members decided on the following as the role of the COI:

- Serve as advocates and subject matter experts to identify and validate best practices.
- Brainstorm and provide insight on updating and improving the innovations and best practices identified by the project team.
- Engage in productive and outcome-based discussions that reflect win-win strategies.
- Advise on improving the outreach and diffusion of best practices for national adoption.
- Share the innovations with peers and participate in dissemination forums.
- Advocate for the best practices and get buy-in from peers in the railroads and highway agencies.
- Volunteer to beta test innovations.

- Add new innovations to an existing innovation catalog.
- Assist with prioritizing innovations for nationwide dissemination.

5.3 The Mission of the COI

Through a facilitated discussion during the COI kickoff meeting, members arrived at the following as the appropriate mission for the project's community of interest:

> The mission of the project's community of interest is to identify and assist with the dissemination and adoption of innovative strategies to expedite the approval and implementation of quality highway projects that cross or abut railways while ensuring the protection and safety of the public, employees, contractors, and state employees; enhancing rail operations; and optimizing resource utilization for railroad and highway agencies.

5.4 Community of Interest Meetings

During the course of this communication and dissemination project, the community of interest formally held four meetings. The kickoff meeting was held in Kansas City, Missouri, in April 2012. The remaining three COI meetings were virtual meetings with screen sharing and presentations by members and roundtable facilitated discussions.

Before each COI meeting, one-on-one discussions were held with each COI member, and preparatory materials were emailed to them. To provide members the opportunity to review and provide feedback, draft proceedings of each meeting were also sent to members. Feedback received from members was incorporated and final proceedings were emailed to members.

5.4.1 COI Kickoff Meeting

The COI kickoff meeting included an overview of the project, discussion about the common challenges faced on projects, and the importance and significant positive impact of mitigating the challenges. The meeting included a review of an initial list of innovations that had been identified by the project team and the importance of successful widespread implementation of the innovations. It included roundtable discussions on member experiences and the roles and mission of the COI to initiate the innovation dissemination.

All COI members participated in the day-long kickoff meeting. At the kickoff meeting, the StarIsis team presented the challenges and relevant innovations identified by the team during the initial research project and set the stage for a collaborative discussion forum. The project team communicated the project objectives and the expectations to all COI members. A significant amount of time was invested in roundtable facilitated discussions to ensure that members had a common understanding of the approach, as well as the need to develop win-win strategies for successful national adoption of the project innovations. With such a background, the team was able to highlight the benefits of implementing the project innovations and best practices for both parties. After the initial presentation and discussions, members of the COI felt

more comfortable with the goals of the project. They felt assured of the team's support in facilitating win-win outcomes, and several members volunteered to participate in the dissemination activities. The meeting also resulted in increased interest in the project, with requests for including additional members to participate in the COI meetings.

To cater to this overwhelmingly positive response, the team created two levels of membership: one as a full member with voting rights if a vote was required, and the second, for associate members who could attend meetings but would not having voting rights. This approach was appreciated and accepted by all the members. This inclusion of members proved productive because, as new members joined the COI discussions, they got exposed to the partnering environment and the collaborative discussions of the group.

Discussions during the kickoff meeting were the start of the dissemination campaign, with initial sharing of the information about the project innovations to the nine state transportation agencies and the five railroads. The presentation was followed by a facilitated roundtable discussion. During the roundtable discussion, members shared their experiences with implementing some of the project innovations. They also presented new challenges and brainstormed on solutions. The final count of the number of challenges faced was numerous. To work within the resources available, members debated and selected several high priority innovations for consideration and focus.

The kickoff meeting set the stage for the collaboration between members of the COI. Members brainstormed and developed the mission statement. They volunteered to test several innovations and to be involved in the dissemination of the innovations to peers. They also volunteered to support the adoption of the innovations and identify new strategies to expedite the various activities on projects involving the two parties.

Using the synergy between the members from the initial COI meeting, the StarIsis project team and the COI members participated in various national and regional meetings to disseminate information pertaining to the project innovations. Together with COI members, the project team presented at several AASHTO regional meetings. Working in partnership with the COI members, the team was also able to make presentations at various non-AASHTO conferences and meetings. This exposed and generated interest from a larger national audience for the project innovations. One such exposure led to the Colorado DOT getting engaged in a project discussion at a 2012 Western Association of State Highway and Transportation Officials (WASHTO) presentation. This led to follow-up discussions and the DOT getting engaged in using the project innovations to address challenges it faced on projects involving railroads.

5.4.2 Subsequent COI Meetings

At subsequent COI meetings, the multidisciplinary group of experts from the railroads, transportation agencies, FRA, and FHWA were requested to share information about the project innovations they were implementing. This sharing of successes exposed other members to details of implementation by peers. It also opened up the forum for discussions, allowing members to

pose questions about the implementation and to brainstorm on how the innovations could be implemented in their specific environments.

During these meetings, COI members also volunteered to advocate for the benefits of the project innovations at other appropriate transportation and railroad conferences and discussion forums.

The COI meetings also served as fertile grounds to encourage members to become champions individually or to pair up and champion the implementation of various innovations. Each "champion pair" consisted of a railroad and a transportation agency that paired up to implement an innovation for better partnership, streamlined processes, or improved project delivery.

Each virtual meeting consisted of facilitated roundtable discussions. Presentation materials were shared using screen sharing. The virtual meetings were successful in achieving the objectives of the project. At the meetings, members actively engaged in sharing their experiences with the implementation of the innovations. Members also discussed challenges they faced and sought the feedback from other members.

The end result was that members were actively engaged in trying out innovations, in the sharing of information relating to the communication and dissemination project with peers, and in arranging new forums for dissemination of information pertaining to the innovations.

The COI meetings served as the first successful forums between the stakeholders. These discussion meetings actively engaged the five railroads that carry over 90 percent of rail freight and over 15 percent (8 of the 52) of transportation departments in the United States.

The summary of the dissemination efforts, champion-pairs, and the partnering memorandum of understanding is described in the following sections.

5.5 Dissemination Sessions: Presentations, Roundtable and Panel Discussions, and Webinars

The project's dissemination campaign involved the sharing of details of the project innovations by the StarIsis team members and successful implementers from the COI through various forums. These included

a. The project community of interest meetings (These were discussed earlier in the report.);
b. Panel discussions;
c. Workshops;
d. Electronic dissemination—webinars;
e. One-on-one meetings and telephone calls; and
f. Presentations at various transportation agency and railroad meetings and conferences.

5.5.1 Presentations, Panel Discussions, and Workshops

As the project progressed, an environment of partnering developed and members got involved in other dissemination efforts. Members were involved in presentations at Western Association of State Highway and Transportation Officials (WASHTO), Mid America Association of State Transportation Officials (MAASTO), and the Standing Committee on Rail (SCORT) meetings of the American Association of State Highway and Transportation Officials (AASHTO).

Working with the project team, COI members arranged for presentations, workshops, and panel discussions on the project at the 2012 American Railway Engineering and Maintenance-of-Way Association meeting in Chicago, at the 2012 National Committee on Uniform Traffic Control Devices (NCUTCD) meeting in Florida, and at three **s**afety conferences. The various dissemination efforts completed or planned at the time of the writing of this report are summarized in Table 5.1.

The roundtable and panel discussions included participation by members from New Jersey, Florida, Pennsylvania, North Carolina, and Texas DOTs and from CSX, BNSF, NS, and Genesee & Wyoming railroads.

The meetings and engagement of the community of interest members resulted in getting the word out about the project innovations to additional transportation agencies and representatives of the railroad community.

At the time of the writing of this report, two more dissemination efforts have been scheduled for the project. A project presentation arranged by Mr. Ahmer Nizam, Railroad and Utilities manager of the Washington State Department of Transportation (WSDOT) has been scheduled for April 30, 2014, involving BNSF, WSDOT, StarIsis, and FHWA at the Utah 2014 AASHTO Committee on Utilities, Right-of-Way and Outdoor Advertising Conference. Another panel discussion involving CSX, BNSF, NS, Florida DOT, Texas DOT, and North Carolina Department of Transportation (NCDOT), moderated by StarIsis, has been arranged by Mr. Tony Bellamy, Director Public Projects from CSX. The panel discussion is scheduled for June 18 at the 2014 Southeastern Rail Safety Conference in Montgomery, Alabama.

Although only four such dissemination efforts were initially planned for this communication and dissemination project, ten sessions were conducted, and at the time of writing this report two additional events have been planned for April 30 and June 18, 2014. This increased extent of the dissemination activity conducted during the project demonstrates the level of interest in the project among the stakeholders. These activities are a good reflection of the momentum and partnership that has been generated to date on the project.

Table 5.1. Dissemination and Information Sharing Events

	Location	Type of Event and Participants
1	Western Association of State Highway and Transportation Officials (WASHTO): Colorado	Presentation by WSDOT and StarIsis
2	Mid America Association of State Transportation Officials (MAASTO): Kentucky	Presentation by Iowa DOT and StarIsis
3	Southeastern Association of State Highway and Transportation Officials (SASHTO) Meeting: Maryland	Marketing materials
4	AASHTO's Standing Committee on Rail (SCORT): Maine	Presentation by FRA
5	American Railway Engineering and Maintenance-of-Way Association (AREMA) Meeting: Chicago	Presentation by StarIsis
6	National Committee on Uniform Traffic Control Devices (NCUTCD): Florida	Workshop organized by Texas DOT and conducted by StarIsis.
7	Highway-Rail Safety Conference: Texas	Panel discussion: NS, CSX, BNSF, and Florida, Texas, and North Carolina DOTs. Moderated by StarIsis.
8	Highway-Rail Safety Conference: North Carolina	Panel discussion: NS, CSX, G&W, and Florida, Texas, and North Carolina DOTs. Moderated by StarIsis.
9	Transportation Research Board (TRB) Annual Meeting, 2014: Washington, D.C.	Presentation: Texas DOT, BNSF, FHWA, and StarIsis. Moderated by SHRP 2.
10	Highway-Rail Safety Conference: Massachusetts	Roundtable discussion: FRA, Maryland, New Jersey, and Pennsylvania DOTs, CSX, NS, and BNSF. Moderated by StarIsis.
11	Subcommittee on Utility, Right-of-Ways and Outdoor Advertising: Utah. Scheduled for April 30, 2014	Presentation by WSDOT, BNSF, FHWA, and StarIsis
12	Highway-Rail Safety Conference: Alabama. Scheduled for June 18, 2014	Panel discussion: FHWA, NS, CSX, BNSF, and Florida, Texas, and North Carolina DOTs. Moderated by StarIsis.

5.5.2 Webinars

The project team successfully conducted two webinars during the communication and dissemination project. A third webinar initially planned for the project was substituted by a panel discussion. The webinars were designed to showcase the solutions as well as the collaboration between the parties involved. The webinars were held in summer of 2013.
With over 425 attendees from 275 different locations participating, the TRB webinar was very successful in reaching out to a wide national audience. The FHWA-sponsored webinar had 182 registrations and 112 sites online.

Based on the participant login information of the FHWA webinar and the TRB SHRP 2 Tuesdays Railroad–DOT Mitigation Strategies Webinar, every state transportation agency attended one or both sessions, with the only exception being Hawaii.

5.6 Champion-Pairs

The project team also worked to have as champions several DOTs and railroads, initially from the COI membership and subsequently from other entities, which were interested in implementing and piloting the project innovations. The team sought to identify personnel at higher levels from such champion organizations, to facilitate at the organizational level the acceptance of, or at least consideration for, use of project innovations. These can be considered vertical champions who push an innovation down through their organization. The team sought the support of senior leadership (CEOs) from the Florida and Michigan DOTs and senior executives from Florida, North Carolina and Texas DOTs who later joined the COI. These executives supported the involvement of their agency personnel on the COI. At the same time, peers from DOT rail divisions and members of groups, such as members of specialty committees at AASHTO, were also sought to promote or explain innovations to their peers. Both types of champions played an important role in the spontaneous and the formal diffusion of ideas.

Resulting from discussions at the early COI meetings, a total of fourteen DOT-railroad pairs initially agreed to become champions and pilot several of the project innovations. Over the course of the dissemination efforts, additional DOT-railroad pairs have volunteered to pilot these innovations. Several states have also applied for implementation assistance from FHWA to implement various project innovations. Aside from the project innovations, several tools are also being developed as part of the SHRP 2 Projects on Railroad–DOT Mitigation Strategies, including several training lessons, a library of resources, and a web tool called the Collaborative Solutions Suite. Collectively, these are expected to facilitate the training of personnel new to railroad–DOT projects and the dissemination of the project innovations. The Collaborative Solutions Suite will also be available for use by the project champions. The state DOTs and railroads interested in adoption or that have already adopted these innovations include

1. The states of Arizona, California, Colorado, Idaho, Pennsylvania, South Dakota, and Texas have been selected for implementation assistance by FHWA to implement a variety of products from the project innovations.

2. North Carolina DOT, Florida DOT, Washington State DOT, and Iowa DOT are intending to use the Collaborative Solutions Suite for training agency personnel on best practices.
3. Pennsylvania DOT is interested in implementing the flagging agreement and streamlined process with CSX and other railroads.
4. Pennsylvania DOT would like to implement a bridge inspection agreement.
5. Texas DOT is interested in implementing the master construction agreement with Union Pacific.
6. Washington State DOT would like to use the lessons to train local agencies on various best practices. The end objective is to have the local agencies also adopt the best practices and use examples of the agreements included in the lessons and library. This is a new area of use of the project innovations. Mr. Nizam from WSDOT noted, in one of the COI meeting updates, that "Reaching local agencies will be an exciting outcome of the communication and dissemination effort."
7. Washington State DOT would like to use the Agreement Builder, an online tool included in the Collaborative Solutions Suite, to expedite developing new agreements.
8. Washington State DOT is also considering adopting several of the best project management practices addressed in the lessons.
9. Georgia DOT is interested in testing, piloting and adopting some of the Project Innovations.
10. Georgia DOT would like to use the Agreement Builder. Agency personnel would also like the Agreement Builder to be enhanced to address other types of agreements that are currently not included in the tool suite.
11. CSX would like to use the Agreement Builder to develop new master agreements for Indiana DOT and update the existing agreements with the Illinois DOT.
12. All nine participating state DOTs and railroads in the COI are extremely interested and have urged SHRP 2 staff and StarIsis to continue the community of interest. COI members are very engaged and would like to continue being a part of the COI. The members shared this sentiment during the final COI meeting.
13. Michigan DOT is currently reviewing the project innovations and identifying those that will best work in their state.
14. Norfolk Southern is looking at some of the flagging best practices included in the project innovations for adoption in several states.
15. CSX and NS would like to implement several of the communication and coordination strategies included in the project innovations. CSX, NS, and Texas DOT have already moved forward with adopting various collaboration strategies.
16. NS and CSX are working with various states to develop master agreements. They have both made significant progress on this front with Kentucky.
17. BNSF has already used the partnering memorandum of understanding (partnering MOU) agreement from the project innovations and signed one with Colorado DOT. BNSF is interested in signing similar partnering agreements with other state DOTs.

18. North Carolina DOT is interested in implementing several of the design-build best practices.
19. New Jersey DOT and North Carolina DOT are interested in streamlining the workflow for agreement processing and developing reports to measure performance.
20. New Jersey DOT has expressed interest in having the training for agency personnel, implementing seven best practices, implementing flagging and right-of-entry master agreements, and having a facilitated workshop to identify and address gaps in current agency processes to streamline coordination and agreement processing.
21. Louisiana Department of Transportation and Development (LDTD) has expressed interest in assistance with streamlining agreement processing, implementing category specific master agreements for grade crossings, warning devices, and new construction, and in receiving training on the project innovations.

While it is clear that many states are facing the challenges addressed in the project and would like to implement several of the best practices, the project team has not had an opportunity to follow up with all such states. The information provided above has been limited to the interest shown by those states that have been actively engaged in the communication and dissemination project or have followed up with the project team as a result of the dissemination efforts.

5.7 Signing the Partnering Memorandum of Understanding

One of the project milestones was to recruit a transportation agency and railroad pair willing to sign a partnering MOU. To successfully accomplish this task, multiple meetings were held with several representatives of transportation agencies and railroads. During these meetings, the team shared examples of other similar memoranda of understanding (MOUs) between transportation agencies and other groups, including the example between the California Department of Transportation (Caltrans) and the contractors association. Using other examples of MOUs, the team was able to explain the benefits of using the partnering MOU.

One of the transportation agencies exposed to the MOU was the Colorado DOT (CDOT). The initial discussion with CDOT on use of the project innovations to address delays on projects involving railroads took place at the WASHTO meeting in July 2012. Follow-up discussions with several CDOT personnel focused on some of the challenges faced by the Colorado DOT on projects involving railroads. The agency had downsized and had also gone through some internal reorganization that affected some of the offices working on projects involving the railroads. These discussions revealed that CDOT has many projects with BNSF that could benefit from the use of various project innovations. Following multiple discussions and several presentations on the project innovations that could address some of the challenges, the CDOT team decided that it could benefit from improved partnering with the railroads. This led to the start of discussions between the DOT and BNSF railways regarding signing a memorandum of understanding to start the partnering effort.

Project team members facilitated various discussions between BNSF and CDOT to ensure concurrence and interest within both organizations to work together to sign a partnering memorandum of understanding. In late 2012, the StarIsis team drafted language to address some of the areas that were important to both parties. Both parties provided feedback and edits to the drafts. The teams held several meetings to address language and provisions detailed in the partnering MOU. The draft language went through several iterations before it was finalized. The partnering MOU was signed by Lyn Hartley, Director of Public Projects at BNSF, on June 31, 2013 and by Timothy J. Harris, Chief Engineer of Colorado DOT, on August 1, 2013.

The MOU covers the following:

- Section 1: Background and Objectives
- Section 2: Partnering
- Section 3: Appointment of Liaisons
- Section 4: Preliminary Project Notice
- Section 5: Preliminary Engineering Agreements
- Section 6: Project Tracking Process
- Section 7: Central Repository
- Section 8: Project Status Conferences
- Section 9: Timely Responses
- Section 10: Stages for Review of Non-Design-Build Projects
- Section 11: Staff Training
- Section 12: Escalation Procedure
- Section 13: Performance Measurement
- Section 14: Resourcing
- Section 15: Annual Meeting
- Section 16: Standard Agreements
- Section 17: Update of Memorandum
- Section 18: Preemption and Exclusivity

The various elements of partnering covered by the partnering MOU are illustrated in Figure 5.3.

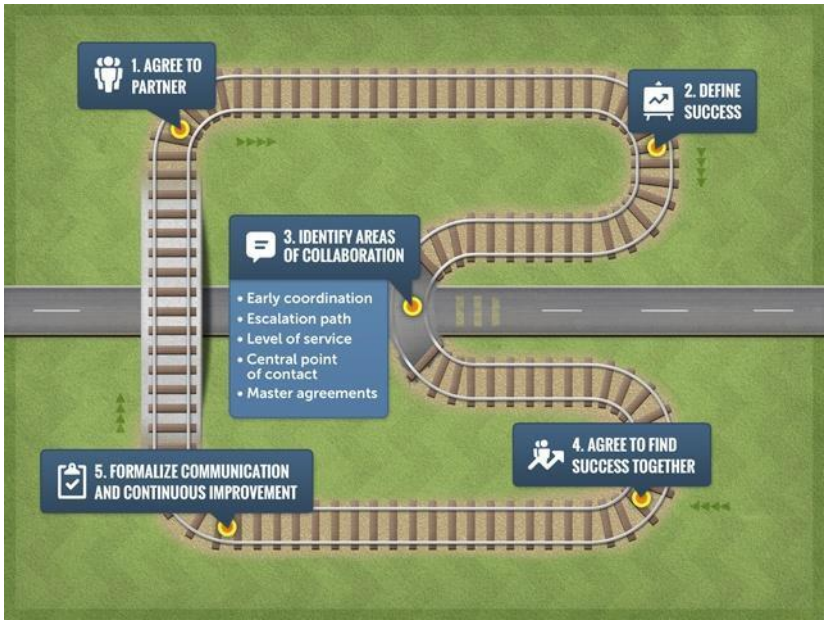

Figure 5.3. Elements of partnering.

The StarIsis team worked closely with Kamie Young, BNSF Public Projects Manager, Charles Meyer, Branch Manager, Traffic and Safety, CDOT, and Matt Flores, Utility Engineer, CDOT, to finalize the language and to get the MOU signed. The Colorado DOT-BNSF MOU is the first of its kind between a transportation agency and a railroad. By having this MOU signed by the Colorado DOT and BNSF Railway Company, the StarIsis team has achieved one very important measure of success in the communication and dissemination project.

The partnering MOU is a non-legal document that will allow both parties to make continuous improvements and update the language to meet the changing needs of both parties as partners. Based on the various discussions held at the COI meetings relating to the MOU, it is expected that once the details of the CDOT and BNSF partnering MOU are successfully implemented, other peers will see the benefits and be interested in adopting similar MOUs. This will further catalyze ongoing and continuous improvements between transportation agencies and railroads.

CHAPTER 6
Summary of Case Reports from Champion-Pairing

The facilitated discussions that took place during the COI also helped emphasize the importance of the best practices to the participating COI members. The discussions and knowledge transfer between the members of the community of interest and the progress made by members serve as a good case study. The discussions and progress made by the champions are summarized under the following categories:

1. Business Process Improvements
2. Flagging
3. Improvements to Grade Crossing Safety and Funding of Crossing Projects
4. Funding
5. Expediting Communication and Coordination
6. Streamlining
7. Improving Agreement Processing
8. Shared Benefits
9. Collaborating to Reach out to Local Agencies
10. Information Access and Data Management
11. Master Agreements
12. Design-Build Projects
13. Training and Knowledge Transfer

6.1 Business Process Improvements

Work involving the transportation agencies and railroads almost always require the signing of agreements. Therefore, significant efficiencies and resource savings can be achieved by streamlining the process of reviewing and signing of agreements.

Mr. Darin Kosmak, Deputy Director of the Rail Division of the Texas DOT notes that "with over 10,300 total rail route miles, the most among states in the United States and close to 9,800 rail crossings, Texas DOT is constantly seeking ways to streamline processes and to improve partnering with the railroads."

Two-thirds of the Texas DOT projects that involve railroads are with the Union Pacific Railroad. Improvements in process involving the DOT and UP result in significant savings for both parties.

Paul Worley, Director of the Rail Division for North Carolina notes that "with over $540 million dollars of projects in North Carolina that involve railroads, implementing some of the project innovations streamlining processes and improving coordination has helped the agency to keep on schedule and within cost and scope in delivering projects."

6.1.1 Streamlining Agreement Processing of Routine Projects

In Texas, historically, all agency project agreements with Union Pacific are sent to the UP main office in Omaha for review and approval. To expedite the process and optimize the use of resources, Texas DOT and Union Pacific have devised a new process where all agreements for routine maintenance and bridge inspection projects that are less than $25,000 and that require flagging services will be sent instead to the regional UP office in Texas for review and approvals. This streamlined agreement processing has Union Pacific delegate signature authority to their regional offices for routine maintenance and inspection activities that only require UP flagging services. With more than three-fourths of the 200 agreements sent to the Omaha office for review and approval being redirected to the regional office, the review and approval of these routine agreements have been expedited. Additionally, offloading of these reviews from the UP Omaha office enables them to focus on reviews of other agreements that expedite other work between the DOT and Union Pacific.

6.1.2 Proactive Approvals on Non-Invasive Projects

Obtaining flagging resources is a challenge for transportation agencies and railroads. To address this challenge, the Texas DOT has streamlined internal processes to separate out projects that are around or involve UP property that are non-invasive. These projects do not require flagging services. With a shortage of flaggers, separating these projects will expedite the review and approvals from the railroads. By developing a list of non-invasive projects and sharing them with the railroads ahead of the project start date, the agency can move forward with these projects without causing any concerns or contentions with the railroads. Proactively sharing the list with the railroads also saves the time that would otherwise have to be spent in discussions and unnecessary project reviews.

6.1.3 Improving Contractor Practices

One of the challenges faced between DOTs and railroads pertains to contractors' insurance not being current. In Texas, the process involves the Texas contractor submitting an executed right-of-entry agreement to the railroads. There are currently no steps to ensure that the contractor has purchased the insurance amount indicated in the agreement before entering the railroad right-of-way. This has been a source of concern for the DOT and the railroads. Texas DOT has been negotiating with its contractors and with the railroads to implement standard agreements or provisions for insurance, indemnification, flagging, and rights-of-entry. On the policy side, the DOT is working with the Texas Association of General Contractors to update standard bid specifications for when contractors are working in railroad rights-of-way. The contractor will be required to have the insurance in place before entering the railroad right-of-way. The requirement of each railroad varies and these updates will address the specific requirements of each railroad.

The new process is expected to eliminate or minimize cases where the contractor has not followed through with the railroad to get either the right-of-entry agreement or proper insurance

before entry on the railroad right-of-way. By imposing the new controls, Texas DOT can formally acquire the right-of-entry agreement, verify the additional levels of insurance, and provide more predictability to the railroads on the contractors' insurance. The agency is also working on establishing a web link specific to each railroad that will make it convenient for contractors to access and fulfill the requirements of each railroad before working on projects involving the railroad right-of-way.

6.2 Flagging

6.2.1 Streamlined Flagging

This practice is a result of the close collaboration between CSX Railroad and Florida DOT (FDOT). This is one of the project best practices that ranked high among community of interest members. Mr. Fred Wise, Manager of the FDOT Rail and Motor Carrier Operations Office said at the project kickoff meeting that "flagging remains an important part of the agency's coordination efforts with CSX."

FDOT has several major construction projects involving railroads in process at any given time totaling hundreds of millions of dollars. The timely availability of flaggers is very important to keeping these projects on schedule. Project delays can increase project costs significantly and negatively impact the agency's overall rail program.

The FDOT practice that has been very effective involves charting out the annual need for flagging by project for each day and sharing it with CSX at least six months ahead of the need. The day-to-day availability and use of the resources are closely tracked, and at least once in two weeks the agency holds meetings with CSX to discuss the status and requirements for flagging resources on projects. The tracking and meetings allow both parties to take corrective action and keep the construction of projects on schedule.

During the project kickoff meeting, Mr. Charles Gullakson, Assistant Chief Engineer of CSX, noted that CSX has a close working relationship with the Florida DOT. He said, "Issues arise, such as an occasional shortage of flaggers, but those issues often come down to a need for communication. CSX often needs ample lead time to find additional employees for flagging, and the scheduled meetings and planning discussions helps CSX address these resource needs." The collaboration has resulted in keeping the projects involving CSX and Florida DOT on schedule.

6.2.2 Flagging Coordination and Costs

The Washington Department of Transportation (DOT) had experienced many problems in the coordination of railroad flagging, resulting in increased flagging and project costs. The agency's flagging process previously authorized the contractors to coordinate directly with the railroads with little oversight. This led to sloppy coordination, including requesting railroad flaggers unnecessarily and of dismissing flaggers prematurely. The agency streamlined and tightened the coordination process to create more oversight and eliminate these unnecessary costs. With the streamlined process in place, the DOT rewrote the general flagging provisions to be consistent

with certain railroad union requirements. This resulted in streamlined flagging activities, better project management, and proactive planning for flagging and lowering of flagging costs for the DOT.

6.3 Improvements to Grade Crossing Safety and Funding of Crossing Projects

Several of the COI member states and railroads have been focusing on improving grade crossing safety. Both DOTs and railroads also work closely with Operation Lifesaver to improve safety around train tracks. Mr. Bellamy from CSX discussed the importance of railroad safety and the new CSX campaign titled, "Play it Safe around Railroad Tracks."

Mr. Wyatt from Norfolk Southern said, "Safety is the first priority for NS." He said that Norfolk Southern's safety goals are dedicated to the safety of employees, customers, and communities, and that the company works toward continuous improvement of its safety efforts.

Ms. Young from Burlington Northern Santa Fe Railroad discussed the railroad's safety campaign, known as "Officer on a Train." The campaign takes police officers on a train during its normal route. The officer then looks for drivers who do not follow railroad safety laws such as stopping for trains.

Mr. Worley shared the North Carolina Department of Transportation (NCDOT) safety initiative titled, "Be Rail Safe, Respect the Crossings, Respect the Track."

Mr. Wise, Florida Department of Transportation (FDOT), shared the agency's numerous efforts with Operation Lifesaver and the agency outreach to various Florida communities. Mr. Wise also shared several safety initiatives by FDOT, including collaboration between the DOT, Operation Lifesaver, and SunRail, reminding people to "keep off the tracks." The group passed out colored signs and safety literature during peak hours at grade crossings.

Mr. Kosmak from Texas Department of Transportation (DOT) talked about the Texas Operations Lifesaver campaign on rail safety, "To a Moving Train, You are Like a Tomato."

Mr. Ronald Ries, Staff Director of the Crossing Safety & Trespass Prevention Division of the FRA, discussed the Operations Lifesaver campaign, "See Train, Think Train." This, Mr. Ries explained, is a public service announcement (PSA) campaign which aims to reduce pedestrian and driver injuries and fatalities around railroad tracks by highlighting behaviors that put people at risk. Launched with the help of the Federal Railroad Administration (FRA), the Federal Transit Administration (FTA), and the Association of American Railroads (AAR), the PSA campaign features bilingual television, radio, print, and billboard advertisements aimed at educating drivers and pedestrians in the hopes of saving lives.

Both state and railroad COI member practices include safety-related communication and outreach to communities, improving grade crossings, closing crossings where appropriate, replacing at-grade crossing with grade separation structures, and the funding of state and local grade crossing projects. Funding for grade crossing improvements has been a challenge for some of the DOTs. Examples of some of the practices by members are as follows.

6.3.1 Highway-Railroad Safety Risk Management Plan

The Iowa Department of Transportation (DOT) has elevated the importance of safety of agency personnel working around the tracks. In coordination with the railroads and the Iowa Rail Advisory Committee, the agency has developed a safety risk management plan that addresses the risks associated with agency let construction projects involving the railroads. The plan provides guidance and direction for field personnel working on or around the project site. As part of implementation of the plan, the agency will be conducting additional training for such agency personnel. This training will be part of the normal training curriculum. The agency expects to have approximately 500 attendees to the 2014 spring training sessions. This spring training is set aside for field personnel. Additional training sessions have been scheduled that will provide training to a total of 1,400 agency personnel in 2014.

6.3.2 Focus on Safety

Florida Department of Transportation's (DOT) focus on safety projects and its participation in funding of safety projects has been very well received by the railroads that operate in Florida. Florida DOT and the network of railroads operating in Florida collaborate on several activities. One of the areas of collaboration is on improving grade crossing safety. Working with railroads to conduct diagnostics at grade crossings every summer is now a routine activity for Florida DOT. Florida DOT participates with FRA in the safety inspection of rail facilities and operations. The DOT's eight inspectors address track, operating practices, signal and train control, motive power and equipment, and hazardous material handling. All Florida DOT (FDOT) work in this area supplements the FRA's inspection activities through the State Participation Program.

6.3.3 Grade Crossing and Safety Projects

BNSF puts a lot of emphasis on safety. The railroad is constantly working with agencies to improve crossings and to close crossings that are not necessary. As part of this initiative, the BNSF public projects division partners with each and every transportation agency to conduct diagnostic reviews at grade crossing.

6.3.4 Closing Crossings and Installing New Grade Separation Structures

Texas DOT has established additional process improvements that address safety by closing at-grade crossings and installing new railroad grade separation structures. In such projects, the railroad's cost participation is in line with federal regulations to contribute 5 percent of the cost of the new structure on the railroad right-of-way. The agency has developed a template and a formula for the computation of the cost of the structure. This template is based on a theoretical structure and can be used by other state DOTs. This template will be included as a resource in the Collaborative Solution Suite and the virtual library for access by railroads and transportation agencies via the web.

6.3.5 Extending Life of Grade Crossings

Iowa DOT has streamlined processes for the repair and resurfacing of highway-railroad crossings. The improved collaboration resulting from the standard process has enabled Iowa DOT to reduce its backlog of state-funded crossings that are in need of repairs and resurfacing from eight to ten years down to two years. The improvements in the quality of materials used have extended the life of the crossings from three to four years to over 13 years, while also improving the safety of the crossings and approaches. Working with the railroads, the agency has also collaborated with local agencies by providing recommendations on maintenance practices to retain the rideability for local crossings and approaches throughout the life of the reconstructed crossings.

6.3.6 Collaborating to Maintain Quality of Resurfacing and Keep Trains Operating

Illinois Department of Transportation (DOT) has collaborated with the railroads to implement a practice that ensures the quality of work on resurfacing of crossings while meeting the schedules and operating timelines of the railroads. In this practice, the railroads manage the resurfacing of the crossings and the approach roads. The practice involves the railroads working directly with the contractor recommended by the agency's district to get the work done.

Discussing the benefits of the practice, James Morris, Project Support Engineer of the Illinois DOT, notes that "By using the contractor recommended by the DOT, the quality of material and work required to extend the life of the crossing is achieved, satisfying the DOT's needs."

The general approach is that the DOT provides the routing information and the railroad, working with the contractor, implements the necessary detours. The district pays for all the work done. This process also provides the railroads the necessary control of the project and enables them to plan the work to meet the timelines and operating windows necessary to keep the track lines open during the resurfacing work projects.

6.3.7 Safety and Outreach to Communities

Many of the COI members have communication and training for employees and contractors to address safety around railroad tracks. An example of outreach to the community can be seen in the Florida outreach on the Miami project. The DOT has been working with the Florida East Coast Railroad (FEC) a Class II railroad on the Miami project. The Miami project is an example of outreach to an area where trains will be reintroduced close to communities. The Miami project will restore services directly to the port of Miami that were not available for seven years. The project will run through downtown. Since it has been a long time since the residents have seen trains in this section of town, the agency is working on outreach to local residents and businesses on safety around the tracks.

6.3.8 MOU: Taking a More Holistic Approach to Crossing Safety

CSX is working with some of the transportation agencies to develop a memorandum of understanding (MOU) that will address crossings across a whole corridor. Instead of the current approach of doing grade crossing projects piecemeal, this will be a more holistic approach that includes improvements that can be made to an entire corridor.

6.3.9 Signal Improvements at Crossings

Another Illinois DOT best practice on grade crossing safety is on signals at rail crossings. The agency allocates approximately $6 million of federal funds for signals and circuitry projects. This enables the agency and railroad to improve the safety of crossings.

6.3.10 Lump-Sum Payment

An innovation that the Iowa DOT has successfully implemented is the use of lump-sum payments on resurfacing and rebuilding of grade crossing projects. The agency pays the railroad $400 per linear foot for materials used for reconstructing the grade crossing. The DOT reviews and updates the dollar amount (per linear foot) as necessary to reflect increases in material costs. This process eliminates much of the administrative overhead of such projects and also simplifies the audit process for the agency.

6.3.11 Consistency on Crossing and Safety Projects

The Manitoba Infrastructure and Transportation (MIT), Canada, is consistent in its approach to working with the railroads. It relies on standard agreements for crossings and safety improvement projects. The Canadian Transportation Agency has provided guidance on costs and rates for work performed by railway companies. MIT uses these guidelines when reviewing and approving invoices from the railroad. The consistency eliminates disagreement on payments.

6.4 Funding

6.4.1 Funding of Grade Crossing Resurfacing

Illinois DOT has established an annual maintenance budget of about $1.5 million of state funds for state-maintained crossings. The agency's Bureau of Local Roads and Streets uses federal safety funds for signalization, circuitry upgrades, and any other protective devices. Depending on the project, Illinois DOT currently splits 50 percent of the cost with the railroads; or the agency pays for materials and the railroad covers the cost of labor; or the DOT contributes a lump sum. The agency's focus on crossing safety facilitates collaboration in other areas with the railroads. The Illinois Commerce Commission funds up to $2 million per year of crossing surface improvement on local roads only.

6.4.2 Revolving Rail Loan and Grant Program

The Iowa DOT established this program that provides loans and grants for rail projects that spur economic development and job growth by connecting Iowa businesses to the rail network. In 2011, special appropriations allowed the program to assist in building rail infrastructure to accommodate the needs of the wind energy sector. These activities enhance the collaboration between the DOT and the railroads.

6.4.3 Process Improvements to Streamline Funding and Increase the Number of Safety Projects Delivered

The Pennsylvania Department of Transportation (PennDOT) has a process, in which federal Section 130 funds are distributed by formula to metropolitan and rural planning organizations (MPO and RPO). This has resulted in a rough average of 60 to 65 percent utilization rate of the 130 funds, while many projects wait for funding. Pennsylvania DOT is currently in the process of revising the approach to distribution of funds for federal Fiscal Year 2015 to get more projects completed and increase this utilization to above 90 percent. This will also address the challenges faced where there are projects in various MPOs and RPOs that are held up for lack of sufficient funds to complete larger projects. By moving such unused funds across these planning organizations, larger amounts can be made available to complete projects. This will facilitate the better utilization of funds and completion of more projects statewide. The agency is looking at strategies to review project needs on a statewide level and then providing funds to complete projects that will be on the MPO's Transportation Improvement Program (TIP). These strategies are still in the review stages. This challenge faced by Pennsylvania DOT was discussed at one of the COI meetings. During the meeting, other members shared their experiences in addressing similar challenges. The COI member from Pennsylvania DOT, Mr. Gregory Vaughn, will use the feedback from members to enhance the Pennsylvania DOT's internal discussion as they work to develop a strategy for the state. The current PennDOT process is also in use by several other DOTs. Successful implementation of the new strategy will serve as an example for these other DOTs facing similar challenges.

6.5 Improving Communication and Coordination

Lack of communication and delays in coordination were issues that all COI members identified as among the big project challenges. Mr. David Wyatt, System Engineer of Public Improvements for Norfolk Southern, closed his update at the final COI meeting saying "One of the big areas of focus between transportation agencies and railroads can be addressed by the 3Cs: communication, communication and more communication."

Mr. Bellamy from CSX said, "There is never too much communication." He shared examples at the COI meeting of how miscommunication and no communication led to project delays.

Ms. Young from BNSF and Mr. Nizam from Washington State Department of Transportation (WSDOT) explained how the WSDOT used a dedicated railroad project manager

to ensure frequent and clear communication and timely coordination between BNSF and WSDOT.

COI members used various strategies successfully to improve communication and coordination within their organizations and between the two organizations. Practices shared by members included the following:

6.5.1 Annual and Quarterly Meetings

- Pennsylvania DOT championed annual meetings with the railroads. The DOT was cited in many discussions on project best practices as using the meetings for facilitating communication and collaboration between the two organizations. These meetings provided a forum for personnel from different areas of the DOTs to meet in person with personnel from each of the railroads and get to know them. The experience of the agency is that these meetings help the teams build the trust and relationships that make it easier to have quick phone discussions to ask and answer questions instead of engaging in multiple email exchanges that require lengthy explanations and longer response times. This best practice was echoed by COI members throughout the project kickoff meeting as being of the highest importance and necessary to the partnership and collaboration between the different project stakeholders.
- BNSF conducts annual meetings with all its transportation agency partners. Ms. Young from BNSF notes that "these sessions provide an opportunity for face-to-face meetings. They help establish relationships that facilitate the open discussions that are precursors to finding 'win-win' solutions when issues arise." With staff turnover, many transportation agencies have new staff in the rail division. To continue the collaboration and keep projects on track, the BNSF public project managers have quarterly meetings with state transportation agencies. In Missouri, BNSF meets quarterly with the district and division offices. These meetings help address a host of issues, including issues with projects that the DOT districts directly manage. These include inspections, maintenance activities, upcoming district projects, and trespassing issues. The DOT districts are responsible for the payment of projects, so these meetings also help the railroad understand the processes and discuss pending payment related issues. In New Mexico, Ms. Young often meets with division and district personnel, as well as with personnel involved with economic plan development. This allows the teams to discuss surface projects, capital plans, and the state's own rail projects, as well as economic development projects.
- The Florida DOT finds annual meetings with the railroads to be important to the continued success of partnership with the railroads. The Florida DOT annual meetings are often held in Jacksonville, Florida because both CSX and Florida East Coast Rail, the agency's major railroad partners, are headquartered in Jacksonville. The DOT has seven districts, each with a railroad coordinator and a utility coordinator who attends the annual meetings. Also attending these meetings are the coordinators from the Florida Turnpike.

At these meetings, the group works on issues with agreements, flagging, crossing surfaces, and new installations of warning devices. The meetings also provide an opportunity for the groups to talk about state-of-the art practices and different technologies that are expected to be used in the future and on pilot projects. The annual meetings also have time set aside for discussing production schedules and ways to collaboratively improve the coordination process. The meetings also help the teams to proactively resolve issues face to face and streamline operations where necessary.

- The North Carolina Department of Transportation (NCDOT) is a big champion of improved coordination and frequent communication with the railroads. The agency has many projects ongoing with CSX and NS. As part of the American Recovery and Reinvestment Act (ARRA), the number of projects involving the railroads and the NCDOT has increased. The agency has over 52 different smaller projects totaling $540 million involving the railroads in various stages of planning, right-of-way acquisition, utility relocation, and construction. These include the installation of about 30 miles of second track and 12 grade separation projects. All of these are traditional projects requiring extensive coordination and collaboration between the DOT and the railroads. The majority of the 12 grade separation projects are with Norfolk Southern, a member of the community of interest. The DOT is targeting to complete work on all the ARRA projects by September 2016. This will give the agency time to complete all the necessary documentation by the contract close date of September 2017. The agency has developed a high degree of collaboration with the railroads that has greatly assisted it with addressing the increased workload caused by the recovery and reinvestment action projects. The agency finds the annual and periodic project meetings an excellent opportunity to talk about processes and projects and to resolve issues on an ongoing basis. The agency and their railroad partners view the meetings as very beneficial. These meetings have been forums for all parties to sit at the table and discuss issues and find solutions. These meetings have facilitated the partnership with the railroads that is enabling the agency to manage and deliver the large number of these complex ARRA projects as planned. This large number of projects scheduled for delivery in a short period of time is possible because of the use of many best practices and partnering between the railroads and the agency.
- Michigan Department of Transportation's (DOT's) meetings with the railroads historically did not cover all aspects of the agency's business related to railroads. The DOT has reorganized the Office of Rail and streamlined many of the processes including those relating to interacting with the railroads. The meetings now cover the entire life cycle of projects involving rail. The meeting agenda covers topics that address more types of projects and all aspects of a project's life cycle. These meetings include agency experts on regulations, crossing engineering, and economic development staff: and the railroads bring team members who can benefit from this meeting. In 2014, CSX brought the Roadmasters to the meeting. Discussing the 2014 meeting with Michigan DOT, Mr.

Bellamy from CSX said that "having the Roadmaster[s] at the meeting is helpful. since they understand frontline issues and can proactively address potential issues on upcoming projects."

Mr. Tim Hoeffner, director of the Office of Rail from Michigan DOT, notes that "As with so many items, communication is critical and just meeting, seeing and discussing with people face to face can fix so many things."

The agency expects this approach to improve the collaboration between all areas of rail operations within the Michigan Department of Transportation (MDOT) and the railroads. Michigan DOT has also started an annual railroad conference with the railroad industry with help from the Michigan Technical Transportation Institute to further improve the discussion and communication with the railroads.

- Having annual meetings is one of the best practices identified by the research project to address issues between the transportation agencies and railroads. CSX views annual meetings as a way to have open communications with the agencies. Mr. Bellamy from CSX notes that there have been several project delays due to miscommunication. He cited examples of successful annual meetings providing the forum for open dialogues with agencies. These helped clear misunderstandings and enabled both parties to move forward and expedite the project work. He also stated that the community of interest meetings have played an important role in facilitating dialogue between transportation agencies and railroads. In the last two years, CSX has met with over 90 percent of the agencies. In the last six months, CSX held meetings with Indiana, Florida, North Carolina, Kentucky, Michigan, Pennsylvania, West Virginia, Virginia, Georgia, Ohio, and Alabama. CSX is also scheduled to have meetings in New York, Massachusetts, and Tennessee.
- Norfolk Southern (NS) has been strongly encouraging its public projects managers to meet often with the DOTs. Mr. Wyatt from NS said that the "annual meetings really help eliminate some of the missteps and proactively address issues that arise from miscommunications." He notes that with the staff turnover in both the DOT and NS, there are so many new personnel working on public projects that having these annual and other meetings provides an opportunity for everyone to meet each other and sit down and discuss projects and related topics that cause any sort of concerns to either party. During the period of this project, Union Pacific has conducted many annual meetings with transportation agencies that are not on the COI. These meetings proactively addressed routine grade crossing resurfacing projects and new construction and grade separation projects.
- Genesee & Wyoming has a consulting company to assist the internal railroad personnel on public projects. The consultant and the railroad's regional team are scheduled to meet with every transportation agency in 2014 and establish good channels of

communications. The intent is for the teams to meet frequently and establish the relationships necessary to work collaboratively with the agencies on projects.

- Manitoba Infrastructure and Transportation has early and frequent communications with the railroads. It also has annual meetings at the executive staff level about projects that are beneficial to the department and the railroads. The annual meeting provides another opportunity to ensure that communication channels are open at multiple levels of both organizations. The meetings build the relationships necessary to expedite issue resolution in the event that they have to be escalated higher up in both organizations. These meetings also facilitate the discussion and facilitate collaborative action to mitigate potential issues.
- Discussing the high speed rail project in Chicago, Chris Keckeisen, Union Pacific Public Projects Manager, shared with the COI members that Union Pacific managers have been working closely with the Illinois DOT's district personnel in Chicago. As part of the CREATE project, UP has implemented many agreements with the Illinois DOT and the city of Chicago. The project included adding a third mainline track on UP's Geneva subdivision, upgrading 21 hand-thrown switches to computerized systems, eliminating six grade crossings, adding a tunnel for pedestrians, and making viaduct improvements. Coordination, communication and effective project management has been a high priority for the DOT, the city, and UP for delivery of these projects.
- Manitoba Infrastructure and Transportation has a particularly good working relationship with Canadian Pacific (CP). The two organizations meet often and have early planning sessions to share information and make sure that both teams get familiar with the upcoming projects and schedules. Addressing the COI discussion on staff turnover posing challenges to both the agencies and the railroads, Ms. Emerson explained that there has been "some turnover of Canadian National staff, and the DOT is now in the process of streamlining some of the processes and working out some coordination issues resulting from the staff changes." COI members agreed that they experienced similar challenges and noted that this highlights the importance of constant coordination and the need for knowledge transfer within and between the two organizations.

6.5.2 BNSF and WSDOT 2013 Joint Session on Early Railroad Coordination

BNSF and WSDOT collaborated in a joint session at the agency's annual project engineers meeting and discussed the need and benefits of early coordination from design through construction. The session was an excellent opportunity to further showcase the importance of early coordination by the WSDOT project offices. It also addressed the major challenge of delays within the agency and with the railroads in the design and construction phases of the project. The discussion was very well received by meeting attendees and the intent is to conduct similar discussions joint sessions involving BNSF and WSDOT every two years at the annual project engineers meetings.

6.5.3 Improving Coordination

Improving coordination is a high priority for CSX. The railroad has been working on improving coordination and communication within the CSX team and with the transportation agencies. Mr. Bellamy from CSX shared examples of challenges faced and successes achieved through improving coordination. The railroad attributes good coordination with Florida, Tennessee and West Virginia Departments of Transportation (DOTs) to the successful and timely completion of projects. On the flip side, Mr. Bellamy also noted that there have been challenges faced and design revisions necessitated by lack of coordination between the railroad and some agencies.

6.5.4 Railroad Coordination on Major Highway Projects

Projects involving widening of various high occupancy vehicle (HOV) lane projects in the state of Washington have significant impact on the railroads. The agency personnel have been working with BNSF, UP, and several short line railroads to ensure that early coordination and frequent communications occur. This has resulted in proactive and successful mitigation of issues.

6.5.5 ARRA Funded High Speed Rail Program

WSDOT is working with BNSF and several other railroads to make sure that there is appropriate coordination on infrastructure agreements, operating agreements, and other agreements on the projects to improve passenger rail operations from Eugene, Oregon, to Vancouver, British Columbia. Three hundred miles of this 467-mile corridor run through the state of Washington. The project will improve the rail infrastructure and support the trains that are expected to have a top speed of 79 miles per hour. Amtrak will be sharing the track with freight trains.

6.5.6 Collaboration to Improve Coordination and Maximize Resource Utilization

Another practice that railroads including CSX have successfully implemented on some projects is collaborating across railroads to improve coordination and minimize costs. The practice involves two railroads collaborating on segments of track that are close to each other on projects involving the same DOT. In this scenario, if a consultant has been hired by one of the railroads and if the other railroad is comfortable with the qualification of the selected firm, they will select the same firm to work on their segment. CSX and NS collaborated on such practices. This helps streamline the coordination and minimize miscommunication and duplication of efforts reducing time and cost on both projects.

6.5.7 Trust and Personal Relationships

Mr. Wyatt from NS also notes that meetings between both teams help to build personal relationships that are so important to the entire process. The relationships built as well the trust that comes with them are critical to the entire process. Having a good working relationship makes it easier to have open conversations, raise issues constructively, and find solutions

collaboratively. The current NS team has successfully established good relationships with all the transportation agencies in the COI where it operates.

6.5.8 Communication and Coordination

A big supporter of partnering with the railroads, the Iowa DOT holds various meetings with the railroads annually. Many of the best practices at the DOT involve Union Pacific. The agency also has implemented several best practices with BNSF, Canadian National (CN), and several short line railroads. The DOT meetings address the following:

- **Pre-let meetings.** Before the project letting and during the project development phase the agency has a public involvement meeting, where the design alternatives are discussed with the area businesses, schools, emergency personnel, and residents of the community. Invitation is extended to the railroads. These meetings allow the railroad also to understand the impact of projects to their business.
- **Preconstruction meetings.** These meetings are held two or three weeks before start of project work. The preconstruction meeting is important to ensure effective coordination and communication between the DOT construction office, the DOT contractor and any subcontractors on that particular project. The meeting invitation is extended to local jurisdictions, the railroads, and the utilities that can be affected by the project. The updates help extend the partnership and collaboration between the DOT and railroads to other stakeholders.
- **Winter Meetings.** The Iowa DOT winter meetings are held at the conclusion of each construction season. These meetings involve all levels of management, and the discussions include an overview of surface repair projects, signals projects, insurance and billing issues, future rail projects, and completed work done by the railroad. The meetings provide an opportunity to share information with individuals from both organizations who may not be directly involved with every stage of a project. The discussions and ideas exchanged during these meetings reinforce the importance of the roles, goals, and expectations of all the stakeholders.
- **Monthly Coordination and Communications Meetings.** The Iowa DOT continues to hold monthly or bimonthly meetings on construction projects with the railroads. They also discuss the crossing projects, the Section 130 projects, and the status of active projects. These meetings are held with each railroad separately. The agenda covers the highway construction projects, primary crossing rebuilds, the crossing surface projects (cities and counties), the safety projects, and any billing, documentation, and inspections that are pending. To address questions from the railroads pertaining to the Iowa DOT master agreement templates (developmental specifications), the DOT will have personnel from the specification office. These experts also are a good point of contact for subsequent follow-up with the railroad on all aspects of the specifications. There will also be a representative from the DOT's local systems office to follow up on any questions

about the status of the guidance provided by the agency to cities and counties through the DOT's instructional memorandum.

6.6 Streamlining

COI members from DOTs noted that often there are internal coordination challenges. With most DOTs operating in a decentralized setup with the central offices and dispersed regional or district offices, communication between the DOT and the railroad can get frayed and confusing. Both railroads and DOTs have developed various mechanisms to address these internal staffing and coordination needs. Some of these mechanisms are as follows.

6.6.1 Single Points of First Contact in both the DOT and the Railroad

One of the practices that worked well for MIT is having a single point of first contact between the DOT and the railroads. Ms. Emerson served for several years as the liaison for MIT; however, in December of 2013 the agency staffed a new position for the railway crossing safety technologist, who now serves in that role and reports to Ms. Emerson. The MIT's experience is that having a single first point of contact between the agency and each of the railroads makes the communication consistent and coordination more efficient. This facilitates keeping projects on track while optimizing utilization of resources.

6.6.2 BNSF Single Point of Contact

BNSF has a public project manager who serves as the first point of contact with the transportation agencies. With third parties providing services for public projects, this single point of contact helps streamline the communication between the two organizations and minimizes the cross communication that takes place when more than one person acts as the liaison.

6.6.3 Outsourcing to Expedite the Agreement Processing

Addressing improvements to streamline the processing of agreements, Mr. Wyatt said that NS has done some internal streamlining by outsourcing the processing of public project agreements. This has led to a smoother process and achieved the goal of timely handling of agreements and expedited the overall agreement processing for the states. The COI members from state transportation agencies that work with NS concurred with Mr. Wyatt that agreement processing on public projects involving NS is streamlined.

6.6.4 Central Point of Coordination

Emphasizing the importance of effective and timely coordination the Florida DOT uses multiple strategies to ensure that effective communication takes place with the railroads. The Florida DOT also tries to ensure that effective internal coordination takes place. Florida DOT has an office of railroads and most of the activities relating to rail are managed through this office. Having such an office makes it easier for Florida DOT to work on streamlining both internal agency processes and as well as those between the DOT and the railroad.

6.6.5 Locally Based Public Managers

RailAmerica, now a part of G&W, had a model of managing public projects where the activities were managed by the central office in Jacksonville. The railroad has streamlined the process by which the management in G&W will move to a hybrid process, where regional offices will collaborate with the G&W consultants to coordinate regional project work. The change will bring a regionally based process with a local public projects management team for each of the Genesee & Wyoming regions. This will also mean more locally based project managers that should also result in saving expenses for the agencies. Mr. Larry Romaine of Genesee & Wyoming said that having the local management will mean less need to fly someone from Jacksonville for an hour and half meeting. Also the proximity and opportunity for frequent contact will help foster improved communications and better relationships with the regions, the railroads, and all the agencies. Mr. Romaine said that Genesee & Wyoming thinks that improved relationships and communication is very important and has been a major part of the selection of the new G&W consultant. This change is expected to result in faster responses to reviews and project activities for transportation agency projects.

6.6.6 Reorganization and One-Stop Office

The Michigan DOT downsized in the late 2000s. This led to the consolidation of all agency rail activities into the Office of Rail. The office manages 665 miles of rail track. CSX, Norfolk Southern Railway, and Canadian National are among the 24 railroads that operate in the state. The agency has been streamlining both internal and external processes on projects involving the railroads. The reorganization includes bringing all railroad regulatory work for grade crossings, close clearances, railroad employee welfare, and all aspects of passenger rail operations and freight operations under one office. The agency's goal is to create this one-stop shopping with a rail office that can comprehensively address all aspects related to railroad activities.

6.6.7 Plan and Design Reviews

BNSF and the DOT's collaborate on larger scale projects to allow third-party consultants to provide design review on plan submittals. This helps expedites the process. BNSF finds that with additional organizations involved in the process, closer coordination and frequent communication between BNSF and the DOT is even more important.

6.6.8 Contractor Agreements and Insurance Tracking

BNSF has ongoing discussions with agencies on process improvements relating to contractor agreements and insurance tracking of contractors. Some state agencies are addressing these provisions in the bid documents to ensure that the contractors have the necessary insurance before starting work on projects. States are also addressing these either in the construction and maintenance agreements or through the contractor agreement. Most state agencies, including several on the COI, put the BNSF contractor requirements and agreement documents in their special provisions or bid applications to the contractor interested in working on projects

involving BNSF. This ensures that the insurance requirements are known before the contractor bids on the job. Also the insurance tracking is now all-electronic and the contractor receives emails on status updates and tracking.

6.6.9 BNSF Escalation Process

BNSF successfully streamlined workflow processing with WSDOT and also implemented a formal escalation process. This resulted in over 98 percent of issues getting resolved in normal project meetings without getting escalated. The railroad is looking to implement similar streamlined process with other agencies.

6.6.10 MOU Between Colorado DOT and BNSF

The MOU between Colorado DOT and BNSF cited earlier addresses streamlining and partnering on projects involving the two parties. This MOU has the same intent as the Presidential MOU on NEPA. The MOU will address delays on projects. It covers a list of streamlined processes and a process for continuous improvement between BNSF and CDOT. With over 10 major agreements being processed by CDOT each year and several months shaved from each agreement being processed, the total savings by the successful implementation of the MOU could be significant.

6.6.11 Streamlining to Improve Coordination

The NCDOT has done some internal staff realignment to ensure better coordination between various personnel in the rail division and the DOT's highway engineers who work on signals and crossings. This closer coordination improves the communication between the appropriate agency personnel early in the project development process resulting in expediting the projects, better utilization of resources, and time savings.

6.6.12 Unifying Standards and Procedures

The Genesee & Wyoming's System Engineering Group has been charged with unifying standards and procedures across the 111 railroads that Genesee & Wyoming operates. This effort is expected to streamline the project coordination between the railroad and the DOTs. It will result in unified standards and processes for warning devices and track components. Mr. Romaine noted that in the past all of these have been handled differently by the different properties. The unified standards will be helpful to the transportation agencies.

6.6.13 Bridge Inspection Process Improvements

Pennsylvania has 1,241 bridges on both the state and local roadways that go over railroads. These bridges are inspected every two years, as per federal regulations. Besides working to develop master agreements to address bridge inspections, the agency is working on a process to streamline and ease the process of inspection of bridges over railroads. This will create a common understanding and create consistency across the department and among consultants who work on bridge inspections. It will detail the steps in the preparation phase to expedite the

process as well as steps to take during the inspection to ensure safety of personnel and property around the inspection site.

6.6.14 Managing Costs

BNSF has been working on ways to streamline processes and eliminate duplication. For example, the Kansas Army Corps of Engineers is working on a grade separation project involving the city and BNSF. This is a $100 million, five-year project. BNSF retained the engineer of record used by the Corps to ensure consistency and continuity. This also avoided the duplication of review and the additional time and associated cost for a new consultant to get up to speed on the project.

6.7 Expediting Agreement Processing

One of the major areas of concern for agencies was delays in agreement processing. Over the last few years many process improvements have been made by COI members to expedite agreement processing. Examples of process improvements include the following.

6.7.1 Agreement Process Improvements

BNSF, in working with WSDOT, streamlined the process of completing agreements to take less than 31weeks from start of agreement processing to signoff of agreement. With BNSF divisional personnel focusing on mainline BNSF projects, the railroad outsourced the agreement processing of public projects to a third party to ensure that the necessary attention could be given to the review of agency agreements. The public projects division is focusing on increased cooperation and collaboration between the BNSF public projects manager and the DOT rail sections to address agreement language conflicts in a timely manner. BNSF finds that together these strategies have successfully expedited the approval of agreements. BNSF has included this as one practice to be addressed in its memorandum of understanding with the Colorado Department of Transportation (DOT).

6.7.2 Electronic Agreement Processing

Iowa DOT has deployed an electronic workflow to expedite the agreement processing of grade crossing projects. This process has been accepted by the railroads. This process uses electronic signatures and a streamlined workflow to expedite the workflow processes from selection of projects to approval of agreements. It allows tracking of all the agreements and produces reminders of impending milestones. It helps with cross-training, automates administrative work, is transparent to the participants, and provides searchable electronic records. The COI members identified the resulting process as one that could improve coordination and communication between railroads and project sponsors. The benefits include

- The system is web-based, so there is no installation of software on users' computers. The process will involve the railroad and local agencies receiving an electronic username and identification that will be required to sign into the system.
- The tracking capability is extremely useful and easy.
- Using the system provides transparency.
- The system ensures that there is only one official document (versus multiple copies of documents). This final approved document will be filed in the Iowa DOT's electronic document management system.
- The system simplifies training.

6.8 Shared Benefits

Some of the DOTs and railroads are collaborating on projects for shared benefits. This has now become common practice in agencies that also manage rail operations. Such collaborations benefit the taxpayers and the both parties. Some examples of such practices include the following.

6.8.1 Continued Partnership and Shared Benefits

Florida DOT has developed a culture of collaboration with its railroads that is assisted by its shared investment in freight rail lines. In a discussion on the project, Mr. Ananth Prasad, Florida DOT secretary, said, "Where there is a measureable public benefit, the agency has shared in investing to improve freight lines. This is more so where it relieves congestion or creates other public benefits."

Transportation Secretary Anthony Foxx and other legislators participated in an announcement in South Florida where FDOT will connect the South Florida Rail corridor, owned by the state, with Florida East Coast Railway, which operates to the East of the South Florida Rail corridor.

Secretary Prasad said, "With this initiative, FDOT will have freight passenger operations on both corridors. The project is unique in that Florida East Coast contributed financially to the project, and CSX and the South Florida regional transportation authority contributed along with Florida DOT and US DOT."

Florida DOT is collaborating with the local and federal agencies on the SunRail project that has purchased 61 miles of CSX track in the Orlando area to operate passenger services. CSX retains a perpetual freight easement in that corridor to continue to serve its customers. Phase 1 involves working on double-tracking the first 30 miles, which will include 18 new stations and which is scheduled to open for commuter operations in the summer of the 2014. The continued partnership between FDOT and CSX is important to servicing clients of both organizations. Additional parallel improvements to the west of Orlando are also in process. This improvement will add capacity enhancements enabling CSX to divert freight trains to the corridor, thereby reducing Orlando area congestion.

6.8.2 Coordination on BNSF Expansion and Improvement Projects

BNSF is making investments in several states. For example, in the state of Washington, BNSF projects include improvements to double-track trains. This sometimes requires addressing crash walls and other agency structures. BNSF has been working closely on such projects with the DOTs. WSDOT's coordination with BNSF ensures that these railroad projects do not have any negative impact on DOT bridges and other infrastructure.

6.8.3 North Carolina DOT Piedmont Improvement Program

This project in North Carolina involves the DOT investing about $520 million of ARRA monies to improve rail infrastructure connecting economic regions of Raleigh and Charlotte and surrounding communities. The North Carolina Railroad Company is contributing some funds, and CSX and NS are doing much of the track work. All three railroad companies and the state will benefit from the project.

Mr. Worley from NCDOT said, "Improving the tracks will improve safety, improve movement of goods to and from our communities, provide better connectivity for our citizens, and ensure more opportunities for our business partners."

6.9 Collaborating to Reach Out to Local Agencies

Railroads and DOTs on the COI are also beginning to collaborate and champion the use of best practices in local agencies. Following are some of the examples of best practices.

6.9.1 BNSF and WSDOT Collaborating to Assist Local Agencies

Mr. Nizam from WSDOT notes that, "In the past, DOTs have been more inward focused, making internal process improvements that address the state level needs. Now WSDOT is going beyond agency boundaries to help local agency partners improve coordination on projects with the railroads."

The WSDOT in collaboration with BNSF has been sharing best practices and lessons learned with local agencies. For example, a Washington county project with BNSF was getting delayed because of easement issues, and the county was at risk of losing its federal funding. At BNSF's request, WSDOT shared the agency practices and assisted the county to get the necessary certification. This allowed the county to successfully retain the funding and proceed with the project.

6.9.2 Instructional Memorandum to Expedite Local Agency Projects

An initiative between the Iowa DOT and the local agencies involves partnering to communicate and extend the use of best practices at the local level. The agency has an office that communicates best practices that are used on the primary system to the local agencies. As part of the initiative, the agency has created and shared with the local agencies an instructional memorandum that communicates the details of the developmental specification agreement that has been successfully implemented between the DOT and Union Pacific. The memorandum

provides direction on the steps to be followed when the local agencies use the DOT's letting process for local projects. This expedites the activities between the local agency and the railroad.

6.10 Information Access and Data Management

With the increased focus on data-driven decision making and demands to improve performance, the need for quality data has become more important. Public agencies and railroads are also under increased scrutiny from the public and shareholders for transparency. With the current focus on safety, the need for quality data has increased several-fold. DOTs are implementing various strategies to track, improve, and share information about their performance. Some of the strategies are as follows.

6.10.1 Improving Inventory Data

The Utilities and Transportation Commission in Washington regulates railroads, including railroad grade crossing safety. The WSDOT is working with the commission to get accurate information on inventories to improve the quality of the data provided to the United States Department of Transportation (USDOT). The end result will be that the DOT and FRA will have better information on the highway inventories related to railroad and highway projects in the state of Washington. With many projects demanding funding this will also help improve decision making and assist with where to best invest limited resources to effectively manage various risks.

6.10.2 Electronic Data Management Systems

Addressing the challenge of having inconsistency in data from multiple sources, the Pennsylvania DOT developed a one-stop source for grade crossing data. The agency implemented a document management system that houses all grade crossing data. The DOT tracks the entire grade crossing inventory in this system and uses it to track the project status and the schedule of both safety and highway bridge projects. The system also is a repository for project documentation and includes the notice-to-proceed, copies of agreements, job correspondence, and public utility commission documents. It is a repository of scanned documents on other aspects of projects, serving also as an interface to other management systems. The sharing of this practice at the community of interest meeting led to a lot of discussion among members. Several agreed that it was good practice but noted that resource limitations could be a barrier to the widespread adoption of this practice by agencies.

6.10.3 Rail Crossing Inventory on the Web Platform

Florida DOT has updated its rail crossing inventory and moved onto a web platform linked to Google Maps. This allows anyone, including the state's 14 railroads, to use it. The inventory includes train and traffic counts and accident histories. The state uses the inventory to prioritize crossings for improvement and funding, as well as for updating the Federal Railroad Administration inventory. The tool is particularly useful for the small railroads that cannot afford to maintain an updated current inventory. The agency has received a lot of positive feedback

regarding access to the inventory. It has also helped to expedite safety improvement projects with the railroads.

6.10.4 Web-Repository of Resources

Ms. Young from BNSF emphasized the need and importance of a single web-based repository of best practices at the project kickoff meeting in Kansas. Other COI members commended the suggestion and agreed that it would expose transportation agencies and railroads to best practices and agreements successfully implemented in other states and give them access to tested solutions that they could customize to suit their needs. BNSF has since then contributed many examples of agreements and best practices for inclusion in the Collaborative Solution Suite's virtual library that will be available to users in late summer of 2014.

6.11 Master Agreements

The DOT and railroad members have made great progress with developing master agreements. Since the Class I railroads on the COI cover many states, they have pursued several efforts to implement master agreements in other states and have made great progress. Following are some of the efforts.

6.11.1 CSX and Illinois DOT Use of Master Resurfacing Template

Illinois DOT and various railroads have been working on addressing the safety of crossings, using a master resurfacing agreement. The agency has a master agreement for resurfacing with CSX and uses standard templates with other railroads for surface crossing projects (with project-specific information). This expedites the time for agreement review and processing. A slightly modified version is being used for installation of signals at crossings.

6.11.2 CSX and FDOT Flagging Agreement and Process Improvements

Besides streamlining the monitoring of flagging needs discussed earlier in the report, CSX and Florida DOT have implemented a flagging agreement to expedite the processing of flagging agreements that help avoid costly project delays. The flagging agreement has effectively been in use for at least ten years. The benefits from the flagging agreement and project management practices include reduction in delays by 6 to 8 months and cost savings of approximately $200,000 per new project.

Another example is of Pennsylvania DOT working with CSX to implement a similar flagging agreement. The agency and CSX were working at addressing the issues relating to the multiple railroad unions in the state of Pennsylvania, with the objective of developing and signing a master flagging agreement for all capital improvement projects. With the capital projects completed, the discussions have been pared down to obtaining a signed master flagging agreement to expedite and standardize the steps required for doing bridge inspection work.

The flagging master agreement and streamlined process of tracking the flagging needs as implemented by CSX and Florida is also being considered by NS for implementation in other states.

6.11.3 Texas DOT and UP Streamlining Review and Approval of Flagging

UP and Texas DOT are also working on a flagging master agreement for bridge inspections and routine maintenance work. With over 50,000 bridges in Texas, the DOT invests a lot of resources and time to complete the 2-year federally mandated inspection of all bridges. With over 10,300 rail mile routes and many bridges going over rail tracks, having a master flagging agreement will expedite the reviews. It will eliminate the need for review and approval of long agreements, resulting in significant time and resource saving that can be directed to other projects. This agreement will also streamline the review and approval of agreements for such projects by delegating the approval from the central Omaha office to the regional UP offices. This frees up the resources tied down in these reviews and also frees up the Omaha resources to work on other agreements that require their review and approval. The master agreement will further streamline the process and further expedite the regional review and approval.

6.11.4 Texas DOT Master Agreement and Streamlined Selection of Safety Projects

Texas DOT has developed master agreements for the federal signal projects using Section 130 funds. With over 9,000 crossings, the master agreement will streamline processes and result in significant saving by limiting the review to a few pages of project specifics for all parties. Texas DOT also streamlined the selection of the Section 130 program of projects and has developed a new prioritization process for these projects.

6.11.5 Texas DOT Master Agreement for State-Funded Resurfacing of Crossings

The Texas DOT is in the process of developing a master agreement with UP for resurfacing or planking of state-funded crossing projects.

6.11.6 Iowa DOT and UP Master Developmental Specifications for New Projects

Iowa DOT and Union Pacific signed a development agreement for development and maintenance of new projects in 2012. Though the development of this first master agreement took several years, it now takes half the time to get project agreements approved. Texas DOT has reviewed this agreement and would like to adopt a similar agreement with Union Pacific. The agency and the railroads have developed basic language for aspects common to all construction projects. Project-specific details are added to this standard specifications agreement as exhibits. The outcome of having this agreement is that the railroads have to only review and approve the exhibits. This shortens the review time for the railroad and the DOT legal teams. The agency has implemented this agreement with Union Pacific. Now the use of this specification is common practice for all Iowa DOT highway projects with Union Pacific. Both sides now focus on the

engineering review of the plan set. This shortened review of the non-engineering aspects of the agreement expedites the overall agreement execution. Ms. Hobbs noted that it is by far the most efficient highway-railroad agreement for the DOT.

Tamara Nicholson, director of the Office of Rail Transportation, notes that "though getting the final Master Developmental Specification approved and signed with Union Pacific Railway was time-consuming, both the agency and the railroad have benefitted tremendously. With the signed agreement in place, new project agreements take few weeks for review and approval. This is a big saving in time as well as resource utilization for both organizations."

Iowa DOT has also been working to implement similar developmental specification agreements with BNSF and Canadian National (CN) railroads. CN and the DOT had exchanged red-lined versions of the draft agreement. The two parties have also had several conference calls and in-person meetings. The discussions over several months have included the Iowa Attorney General's office, the CN legal staff, and the CN government affairs person. Ms. Hobbs explained to members of the community of interest at the December 2013 meeting that the DOT now has a final developmental specification that was approved by CN. The two parties have already tested the new Master Developmental Specification on several new projects and plan to use it on all projects in the future.

The agency is in the process of incorporating the developmental specification with CN into the DOT's standard specifications for highway and bridge construction. BNSF and the Iowa DOT continue to review and edit their developmental specification document and expect to have it signed in 2014.

6.11.7 Iowa DOT and UP Expediting Minor Maintenance Projects

The success achieved on major construction projects between Iowa DOT and UP has translated into expanded partnering between the two parties. The working relationship has carried over to other projects, resulting in expedited processing of agreements on minor projects. For example, the Iowa DOT and UP have a process where they use a single-page letter agreement on minor scale projects for maintenance-type activity with no easement or real estate transaction.

6.11.8 Texas DOT and UP Reverse Agreements

Another type of unique agreement that is being developed between the Texas DOT and Union Pacific is the reverse master agreement. Texas is encountering a lot of energy-sector-type projects, and the reverse agreements streamline processes related to such projects. Examples of such projects involving Union Pacific are double tracks on the mainline across the state. Other new industry projects cross the state highways. The current process requires that for each railroad-initiated project, each time the railroad has to reimburse the state for preliminary engineering reviews, construction engineering reviews, providing traffic control, or other activities along those lines, Texas DOT has to go to the transportation commission and get their approval or a minute order. This process is time-consuming, and the process takes about a month to get the approvals and agreements before the railroads can reimburse the DOT. A reverse

master agreement should expedite the process and eliminate the need to seek approvals for processing agreements from the commission.

6.11.9 NS and NCDOT Master Construction and Maintenance Agreement

The North Carolina DOT (NCDOT) has developed several master agreements for streamlining and expediting agreements with the railroads. NCDOT and Norfolk Southern signed a master construction and maintenance agreement. The two organizations have used this agreement since 2012 on over 50 projects to expedite project delivery under ARRA. The agreement will expedite the review and signing of agreements relating to the construction of projects between the two parties and will enable the on-time delivery of the ARRA projects to meet the 2016 construction deadline set by NCDOT.

6.11.10 CSX Master Agreement

In 2012, CSX completed a master agreement with Kentucky Department of Transportation (DOT) that addresses new construction projects and their maintenance. CSX is in the process of updating the right-of-entry agreement to include bridge inspections with the West Virginia Department of Transportation (DOT). It also has a master agreement that covers signals with West Virginia DOT. The railroad is in the process of drafting an all-inclusive master agreement with Indiana Department of Transportation (DOT) and on a master agreement with Georgia Department of Transportation (DOT). CSX also has various agreements with Tennessee Department of Transportation (DOT). The railroad is working with various other states on creating standard or master agreements.

6.11.11 NS Master Agreement with Georgia DOT

NS has completed work on an agreement template that addresses a range of project types with Georgia DOT. This master agreement template is a long-term agreement that will have a 10-year life and, once signed, should be very helpful in streamlining and expediting agreements. It is an all-inclusive agreement that addresses all types of projects other than lights and gates. NS is also in the process of reviewing the final draft of the master agreement with the Commonwealth of Kentucky. Attorneys from both organizations are in the process of final review of the language and provisions in the agreement and they expect to have this completed before the summer of 2014.

6.11.12 BNSF Master Agreements

BNSF has master agreements for signal, grade crossing resurfacing, and roadway projects that include widening of existing roads and improvements at intersections and grade separation projects with several states including Washington, Texas, Kansas, New Mexico, Missouri, Colorado, Wyoming, and Oklahoma. BNSF appreciates the importance of the master agreements in eliminating unnecessary administrative costs related to the reviews and intends to continue

pursuing the use master agreements to streamline and expedite the agreement processing with other states.

6.11.13 CSX and NCDOT Master Right-of-Entry Agreement

The North Carolina DOT and CSX signed a master right-of-entry agreement in 2012. The agreement addresses provisions that expedite the responses from the railroad, and allows entry of agency personnel on to the railroad property for work detailed in the agreement within ten days of the agency's request for entry. These agreements have been very successful and have been a big factor in the agency's ability to keep the projects on schedule. This expedites the processing of agreements from months to a 10-day notice before entry. The agency is working on a similar agreement with NS.

Pennsylvania DOT has also been working with CSX and NS to develop a master right-of-entry agreement to address bridge inspections. The agreement with CSX is currently being reviewed by the DOT's chief legal counsel's office, after which it will go to CSX for comments.

6.11.14 NCDOT and CSX Master Agreement for Closures

The North Carolina DOT developed and signed a master agreement for grade crossing closures with CSX in early 2013. This agreement addresses one of the railroad's major concerns about grade crossings and their focus on closing at-grade crossing. Grade crossing closure projects improve the collaboration between agencies and railroads. The agreement expedites the agreement processing and limits the review to few pages of project-specific information. It optimizes and directs the use of resources to the completion of projects.

CSX has worked closely with several transportation agencies to close crossings that were not needed. CSX also has such an agreement with Florida DOT. CSX and the two agencies have successfully managed to reduce incidents at at-grade crossings.

Using the agreement with CSX as a baseline, NCDOT was able to expedite the development and signing of a grade closing agreement with Norfolk Southern. This agreement between NS and NCDOT was signed in late 2013.

6.11.15 NS Signal Master Agreements

Norfolk Southern has signal master agreements with several states. These include Ohio, North Carolina, Georgia, Kentucky, and Florida.

6.11.16 Other UP Master Agreements

UP is also working on master agreements with the Arizona Department of Transportation (DOT), the California Department of Transportation (DOT), the Oregon Department of Transportation (DOT), and the Texas Department of Transportation (DOT).

6.12 Design-Build Projects

Most transportation agencies have either already embraced or are in the process of embracing design-build projects. Often these projects are large projects requiring a higher level of coordination than what is normally required on traditional projects. Following are some of the successful practices relating to design-build projects:

6.12.1 Risk Acceptance and Tolerance on Design-Build WSDOT Approach

One of the strategies to expedite design-build projects is to plan the design of the entire highway structure to be built in an approved or already acquired right-of-way before contract letting. This approach is used on projects where the DOT has a high level of confidence on the acceptance of the design by the railroad and hence is willing to take some risk. In this alternate approach, the agency accepts some level of risk and incorporates special language into the construction and maintenance contract to indicate that it may be necessary for the railroad to review plans in stages. The risk here is that one design element may be reviewed and approved and the next element may not be. To date, this approach to staged plan reviews by the railroad has worked because the agency is selective in implementing the approach to projects where the confidence is high and the projected risk is low.

6.12.2 NCDOT Design-Build Projects

The NCDOT has been involved in design-build (D-B) projects for several years now. D-B projects that also involve the railroads pose some additional and different challenges. The agency has streamlined coordination on projects involving the railroads to proactively minimize challenges related to project cost, schedule and scope. D-B projects have no early plans for project development, so getting the railroads involved very early in the process is very important. There are discussions in the agency to bring the railroads in as early as during the public hearing map stage. The agency is working on having conference calls and discussions with the railroads before the project information goes out for reviews. The agency's rail division is also collaborating with the design section of the DOT to become more involved in projects involving railroads**.** The agency is continuing to enhance the process of engaging the railroads based on the past D-B project experience. NS is slowly adopting the experience on design-build projects with NCDOT on similar projects with other DOTs.

6.12.3 Texas DOT Design-Build Projects

In Texas DOT, the design-build contractors hired for these projects have some unique challenges in working with the railroads. The railroads are risk-averse and want 100 percent plans before they give approval for any work on the railroad right-of-way. Since that is not possible in such projects, the Texas DOT has developed various tools to address these challenges and to reduce risk to the design-build contractors while also making the railroads more comfortable with the construction of the projects. Many of these include applying the project innovations addressed by this project.

The coordination of design-build highway projects with railroad companies includes developing and obtaining railroad approval of critical design elements before bidding the project. This typically involves approval of 30 percent design schematics (plans) of the portion of the project affecting or impacting existing and future rail facilities located within railroad right-of-way. This practice ensures early involvement and buy-in on the project from the railroad, and reduces risk to the design-build contractor. Reduced risk results in lower overall project cost.

6.12.4 NS Design-Build Projects

NS has design-build projects ongoing in Ohio, North Carolina and Georgia. Mr. David Wyatt of Norfolk Southern Railway emphasized that "the key to design-build is to involve the railroads early. This means involving the railroads when the agencies start thinking about having a project."

He emphasized the importance and urged members to get the railroads involved as early as possible. Mr. Wyatt said this early involvement will help both parties avoid some of the missteps that can delay the projects. Mr. Wyatt also noted that it is also likely that the railroads may have some suggestions on a design solution that may address potential issues and be acceptable to the DOT. Early communication may bring such options to the discussion early in the process to serve as a good solution that will expedite the project.

6.13 Training and Knowledge Transfer

With railroads and agencies downsizing over the last several years, the loss of institutional knowledge has become a challenge. Additionally, knowledge has also been lost due to retirements and attrition. As agencies hire new personnel, the need for training is becoming increasingly important. DOTs and railroads are aware of this need, and several are ensuring that the training also addresses projects involving road and rail. Following are some of the efforts:

6.13.1 Manuals, Training, and Knowledge Transfer

With the high staff turnover, Pennsylvania DOT is training approximately 150 personnel on various aspects of project management. Among other aspects of project management, the training also addresses early coordination with the railroads on projects involving them. Gregory Vaughn, a grade crossing engineer for the Pennsylvania DOT and a project stakeholder, notes, "Pennsylvania DOT addresses the need for early coordination in its courses for project managers and also emphasizes the importance of early and ongoing coordination with the railroads at each grade crossing meeting."

6.13.2 New Hires and Knowledge Transfer

Texas DOT has hired several new personnel in the rail division. Mr. Darrin Kosmak has these new personnel reviewing the training, a component of the Collaborative Solutions Suite that addresses many of the best practices being disseminated by this project. The suite of tools also includes a virtual library that houses examples of agreements, best practices by peers, and other

resources to assist stakeholders working on projects involving transportation agencies and railroads. This will reap two-fold benefits for the DOT. The DOT expects these personnel to use the examples from the project's virtual library to refine and update the agency's agreements. This, while providing training and facilitating knowledge transfer to new staff, will also ensure that they take ownership of the new agreements.

6.13.3 Project Development Guide

The Texas DOT has published a railroad project development guide. The guide is a portion of the railroad operations manual that is distributed to all the Texas DOT district railroad coordinators for reference and use. The coordinator also shares the document with district project managers, designers, structural engineers, and consultants. This guide details the roles and responsibilities of the agency personnel, railroads, and the consultants in developing all different types of projects that involve the DOT and railroads. It provides information on the different types of agreements and documents that are required before starting work and after completion of project.

6.13.4 NS Public Projects Manual

NS has published a comprehensive public projects manual. Using this manual will help states, counties and local agencies streamline and expedite working on projects with NS. The manual details the step-by-step processing of various aspects of projects. It includes the design criteria for projects and is a soup-to-nuts manual that will be very helpful to transportation agencies. This manual has been included in the Collaborative Solution Suite's virtual library and should be accessible nationally by late summer or early fall of 2014.

6.13.5 BNSF and Union Pacific Design Standards

BNSF and UP have together published common design standards that will help agencies and consultants working on projects with the two railroads. By documenting the guidelines, the railroads make it convenient for contractors on both sides (DOT and railroads) to develop plans and designs to standards. It eliminates the need for revisions to plans and designs. The intent is that the common design standards will provide consistency across larger numbers of projects and make it easier for consultants working on projects with either railroad.

Several other DOTs have also published guidance documents to assist personnel from the agency, the railroads, and contractors to have a better understanding and consistent approach to projects involving road and rail.

CHAPTER 7
Implementation Plan to Sustain the Community of Interest

7.1 Success of the Project Community of Interest

A total of seven Class I railroads operate in the United States. As is evident from Figure 5.1, of these seven railroads, UP, BNSF, NS, and CSX are dominant, and Genesee & Wyoming is the largest short line railroad. The DOTs of the 48 states (excluding Hawaii and Alaska) in the United States interact with one or more of these four Class I railroads, and several interact with Genesee and Wyoming. The four dominant Class I railroads and Genesee & Wyoming were members of the project's community of interest. The COI also had eight U.S. state DOTs, representing the four AASHTO regions. Manitoba Infrastructure and Transportation, Canada, was able to participate virtually and provided an international perspective. FHWA and FRA also participated in the COI. Thus, with the limited budget available, the project team successfully engaged a broad spectrum of stakeholders maximizing a nationwide representation to create a good and well-balanced community of interest. As detailed earlier in the report, the team successfully achieved and exceeded the stated objectives of the project.

All COI members were actively engaged in the dissemination effort and in championing the success and value of using various project innovations. As detailed in Chapter 6, many of the members have also made great progress with implementing several project innovations.

7.2 Catalyzing National Deployment

The communication and dissemination of the mitigation strategies undertaken by this project have been an overwhelming success to date. The COI members have become very engaged in the project. This has led to members identifying new best practices, training needs, importance of peer-exchange sessions, and workshops that will help with the national adoption of the project innovations at the state and local levels. The activities of this communication and dissemination project served as an essential interim step to the full national deployment and successful national adoption of the project best practices. The success of the project activities has set the stage and will serve as an important pre-implementation step leading to the national deployment of the project innovations.

Mr. Worley of the North Carolina Department of Transportation said the following about the potential for success after attending the project presentation at the 2014 Transportation Research Board annual meeting:

> "The team was able to establish an unprecedented and game-changing environment of collaboration and partnering among transportation agencies and railroad companies. This environment is further enhanced and supported by the Collaborative Solution[s] Suite developed by the StarIsis project team that will be available to users in the fall of 2014**."**

The project activities were focused on taking the innovations to beyond the tipping point.

Working with the members of the COI, the StarIsis team has created a collaborative environment and focused the activities of the community of interest members in a way that can quickly and easily evolve and be scaled up to successfully support the national deployment efforts. Continuation of this path should result in transportation agencies and railroads continuing to collaborate in implementing the project innovations to proactively address the common challenges faced on projects.

The environment is now ripe for widespread acceptance of the project innovations. However, it needs to be appreciated that assisting states and local agencies in the national adoption will require a systematic approach and will require the investment of time and funds. Thus planning for these efforts is very important.

Mr. Wyatt from Norfolk Southern Railroad at the last COI meeting said,

> "The team, with the appropriate dissemination efforts and tools, has the potential to catalyze an expedited dissemination of the ready-to-implement project innovations on a national scale, all of which have successfully demonstrated their ability to shorten project delivery times, reduce project costs, streamline processes, improve efficiency and safety, reduce delays and inconvenience in traffic and freight movement, and, overall, reduce potential liability."

7.2.1 Influencers in National Deployment

It has been evident that the three primary factors that have been critical to the success achieved in the dissemination and communication effort so far in the project are

1. The collaborative environment created among the stakeholders;
2. The project team's facilitation, follow-up, and frequent communication with the COI members; and
3. The creation and level of engagement of the community of interest.

Recognizing the critical nature of these three factors is important to the success of any effort that aims to achieve a national deployment of the project innovations. Any implementation plan will therefore need to consider means to not only sustain the community of interest, but to grow its activities sufficiently to facilitate the engagement of the larger nationwide community of stakeholders. This growth will of course also need to be managed in a manner such that the collaborative environment is retained and expanded. This management effort is all the more important, since more challenges are expected to arise, as the activities of the COI expand. Also, with active participation by a larger audience, new innovations and resources will be available for the community to benefit from. The management of and access to such innovations and related tools and resources will also need to be effectively managed to ensure that the level of

interest, collaboration, and participation of the COI in the solutions are not only maintained, but also continue to thrive.

7.3 Ensuring Long-Term Sustainability of the Community of Interest

One of the important deliverables required by the project is an implementation plan for the long- term sustainability of the community of interest. This section proposes strategies, which, if implemented, will continue the widespread dissemination of the innovations and increase the number of best practice implementations to beyond the tipping point.

The team proposes innovation diffusion strategies shown in Figure 7.1, which build upon the efforts of this project to date and its work with the champion-pairs and the community of interest to create a critical mass of users that can carry these innovations across the nation.

There are several factors that need to be considered in establishing a plan for the long-term sustainability of the project's community of interest. These factors follow.

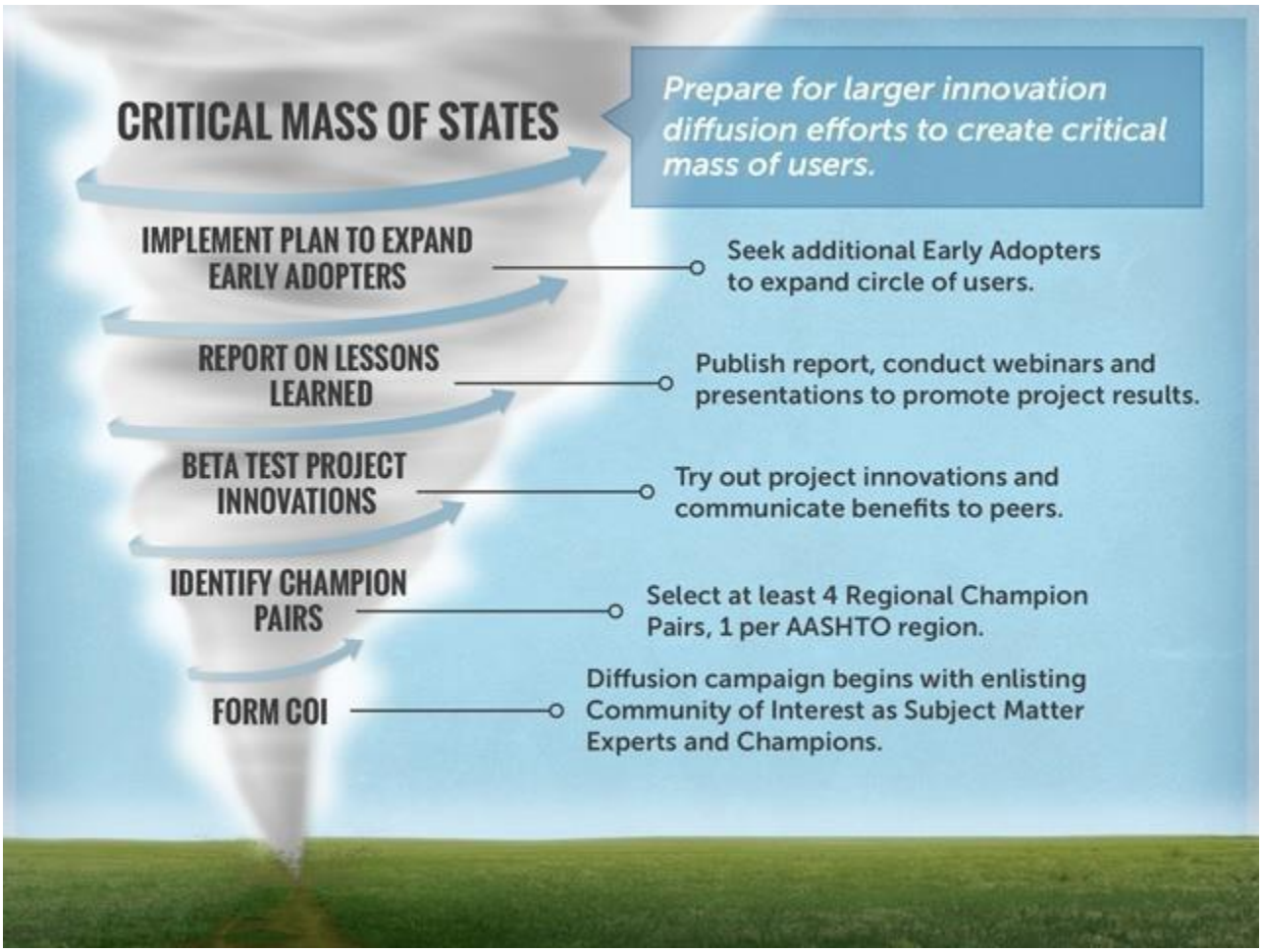

Figure 7.1. Innovation diffusion.

7.3.1 Participation and Collaboration

Two important aspects that are critical to sustaining the community of interest of stakeholders to achieve the objectives of the project are participation and collaboration. Not only will the participation from both transportation agencies and railroads need to continue at the current levels, but also the discussions need to continue to be collaborative so that the outcomes are productive and wins for both parties.

The issues of trust, improper communication, and lack of timely coordination were identified as factors contributing to challenges between the agencies and railroads. Establishing and maintaining an environment of trust and collaboration between the members is integral to the long-term success of the COI and, more importantly, to resolving challenges on various activities relating to projects involving the two. The StarIsis team was proactive in addressing these issues. Left unaddressed, these issues can derail the productive work done and successes achieved to date.

7.3.2 Organizational Differences

The national deployment phase should consider the differences in the organizational culture, the strategic goals, the growth objectives, and expectations of timeframes for action in the railroads and in the transportation agencies.

The railroads are far more centralized; therefore, once representatives are successfully engaged, the effort of coordinating gets easier. Working with a railroad's public project manager is akin to working with one of the DOTs districts and divisions. By engaging the railroad's public projects director and through him or her engaging one or two public project managers, it is possible to use peer communication to reach out to other public projects managers within that railroad.

On the other hand, states and local agencies are far more numerous, and their approaches and requirements vary significantly across the nation. Also, the budgets available and the funding constraints vary significantly across the states, so outreach efforts to them have to be commensurately larger.

7.3.3 Team Dynamics

Team dynamics played an important role in the success achieved during the project activities and will continue to be important to the successful operations of the COI. It will be a big contributor to achieving the goals of championing and advocating for acceptance of solutions to address challenges and delays on projects involving road and rail. The dynamics between the COI members and the team coordinating and facilitating COI discussions will also be important in ensuring that the environment continues to be conducive to partnering and continuous improvement.

7.3.4 Multi-tier Engagement

Another important factor is ensuring that the right people at the appropriate levels of both organizations and from FHWA and FRA are engaged in the COI. The right level of engagement will vary across states. Some state transportation agencies are responsible for the management and operation of trains, while others are not. Thus, transportation agencies vary in their responsibilities and involvement with railroads.

7.3.5 Resource Limitations

With downsizing over the last decade, both transportation agencies and railroads have to work with limited staff resources. With railroads being in an expansion mode, the internal organizational priorities are more focused on growth. With transportation agencies being challenged by limited funds, agency personnel are often wearing multiple hats and have limited time for activities outside of the agency.

Facilitating discussions and managing the COI activities has to take into account these member resource limitations while managing to ensure maximum engagement of members. Ensuring active engagement of members is important to sustaining a productive COI necessary for championing the national deployment.

7.3.6 Systematic Rippling of Best Practices to Beyond the Central COI

With the expected expansion in railroads, the projects involving the two parties and the interaction between the two organizations will continue to increase. The challenges identified in the initial (2008–2010) research project will continue to be a factor for the next many years.

The impact and importance of expanding the dissemination of the project innovations, as well as the implementation effort to reach all 52 state transportation departments, local and regional government agencies, and the short line railroads, will continue to be significant.

Widespread implementation of the project innovations nationally will result in expedited project delivery and fewer numbers of projects that encounter cost increases and/or delays in delivery. In the instances where project costs increase or schedules get delayed, the impacts will be less severe than otherwise. This can be achieved through multiple strategies that will cause a rippling effect and the impact necessary for national adoption of these practices.

The strategy for the COI should therefore include having a central community of interest similar to the one created in this project, augmented by expanding into four regional community of interest forums that reflect the four AASHTO regions. The model would parallel the successful Transportation System Preservation Technical Services Program (TSP 2) groups formed by FHWA and AASHTO to support pavement and bridge preservation best practices.

The recommendations are as follows:

Central COI: Systematic Infusion and Growth at the Central Level

In addition to the successful dissemination done through this project, the accomplishments of this project reflect the successful partnership that has been created among the members of the current COI. Retaining and enhancing this partnering environment will expedite the championing of project innovations and catalyze the information sharing among peers in transportation agencies and railroads.

An approach that expedites knowledge transfer from existing to new COI members will help sustain the current environment of collaboration between transportation agencies and the railroads. This form of knowledge transfer is necessary for implementing the best practices nationally. The intended goals of sustaining a productive COI that collaborates and champions the use of project best practices can be achieved by the systematic infusion of new members into the COI, while current members continue to be engaged in the community. This will ensure that as new members join the COI, there will be infusion of new ideas, while the conduct of discussions will continue to be similar to what existed in the current environment. This approach will thus ensure the continuation of the collaboration and partnering between the members.

Phasing in new members will also expose them to the collaborative discussions that result in win-win strategies.

The right facilitation and administrative support and the engagement of new members, while existing members continue to be part of the COI, will ensure that the partnering agencies (AASHTO and FHWA) have a much better chance of sustaining a productive forum of stakeholders who can be counted on to champion the best practices nationally.

If the regional forums discussed next in the report can be set up and sustained, then discussions of new challenges that are bound to arise will become part of the conversation. Deliberating and developing solutions to these new challenges and championing their testing and implementation will become routine.

Regional Outreach and Impact

Coupling the phased growth of the current COI (central COI) with targeted regional stakeholder outreach meetings will expose new regional stakeholders to the Collaborative Solution Suite. It will catalyze and cause the rippling dissemination of the innovations to the regions. Some of the innovations may address priorities of a region.

Regional outreach can catapult the adoption of innovations that address regional priorities and make them routine practices. These regional sessions can be targeted to address specific regional issues. Incorporating panel discussions that include members from the central COI, who have successfully addressed specific challenges that are pertinent to the region, will expose potential adopters to tested strategies, minimizing concerns of failure, and increasing the chances of adoption. Figure 7.2 shows how interaction between the central COI and the regional COIs can result in a balanced approach to address challenges that are common nationally and those that are specific to the regions. It also shows how the collaboration that exists today in the central COI can cause the necessary rippling effect to result in a similar positive environment at the regional levels. When the interaction is well managed, the central and regional COIs can work synergistically to

achieve the long-term success required to sustain the strategies that will proactively and continuously address challenges on projects involving transportation agencies and railroads.

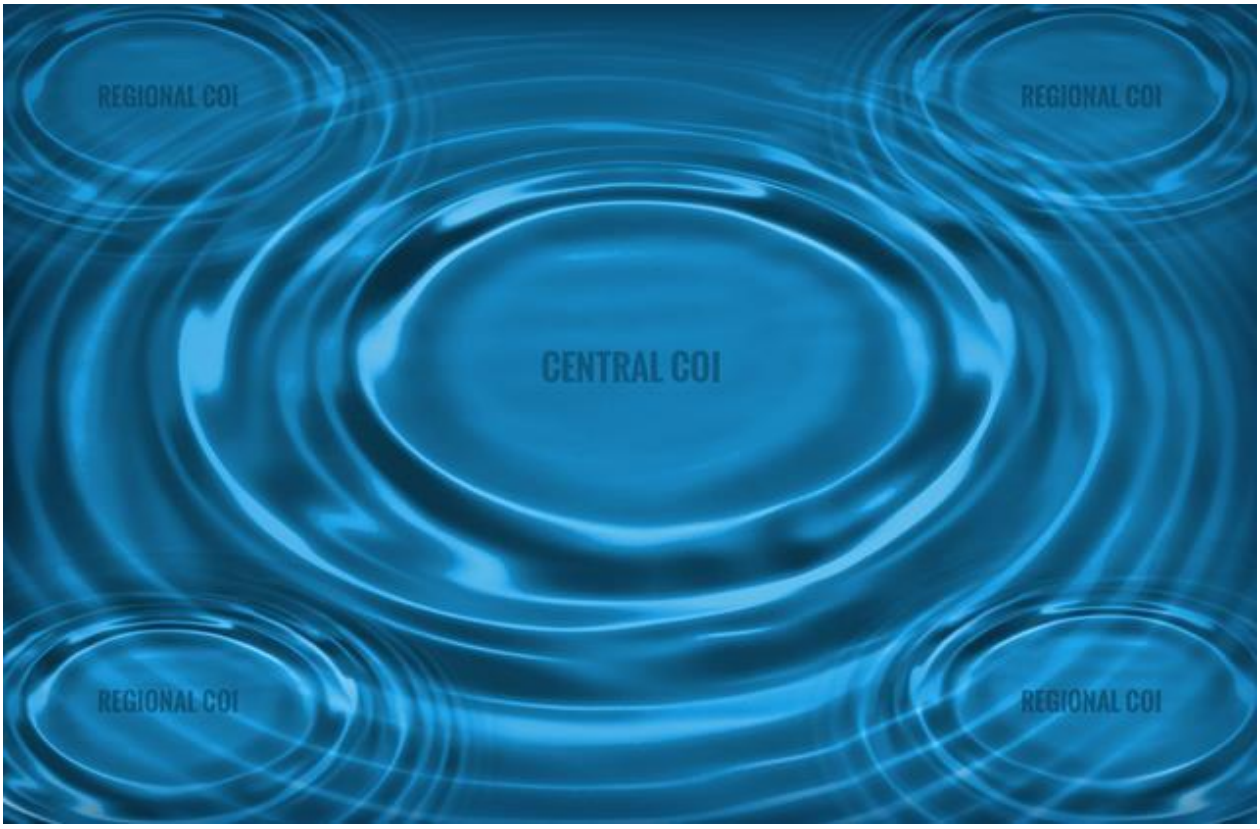

Figure 7.2. Relationship between the central COI and regional COIs.

National Conferences

Current COI members expressed the importance of national conferences for information sharing. Members indicated that conferences are forums to learn from peer champions and advocates who can share best practices and lessons learned. Implementers can serve as coaches and assist new adopters navigate any pitfalls that may be encountered on the implementation journey.

Over the years new challenges will be encountered and these forums will facilitate the discussions necessary to strategize on new solutions. They can also be used to fund the testing of new solutions and to generate support for new champions.

By having a combination of biannual central COI meetings with regional meetings and having a national conference every alternate year will expose many participants in a brief time to the opportunities presented by the project innovations, as well as additional innovations that will be developed on an ongoing basis.

By inviting the local agencies and other short line railroads to the conferences, the best practices can be disseminated to address the challenges at the local level too. This approach will

create the momentum necessary to get each state and some local agencies to adopt best practices and thereby increase the numbers of adopters of the best practices toward making them routine practices.

Funding

Funding continues to be an issue for public agencies, so it is also important to fund the cost associated with member travel and participation in these meetings. Pre-session preparations, quality of facilitation, and level of interest and participation of members will be very important in influencing the outcome.

Throughout the current project, the StarIsis team has been working on setting the stage for a successful expansion of the implementation efforts. To fully capitalize upon the benefits of the best practices, model agreements, and streamlined agreement processes, the outreach and support efforts may have to be carried on for many years.

7.3.7 Access to Existing and New Solutions

One of the requests by the COI members was to have web access to a repository that would house the project best practices and other resources to assist states and transportation agency personnel working on projects. To address this request for easy access to example agreements and model processes that can serve as templates for new adopters, the Collaborative Solutions Suite, a web suite of solutions that includes training lessons and a virtual library of resources, has been developed and will be available to users by fall of 2014. The library houses various best practices, agreements, and manuals from transportation agencies and railroads that can serve as examples for future adopters of the best practices.

Keeping the information and the site updated will not only serve as a one-stop window to useful resources for both organizations it will also focus the limited resources to reviewing tested successful solutions that can be accessed from the library. This will focus the efforts of both parties on implementing successful solutions instead of spending time developing solutions that already exist.

To continue to provide solutions that can proactively address roadblocks to projects, it is important to continue showcasing and bringing to the forefront programmatic solutions to issues that are part of the current national discourse. These include best practices on safety, such as model processes to speed projects that improve grade crossing safety, repave crossings, or close unnecessary crossings when they have already been developed and used by peers.

7.4 Summary of Action Items for Implementation Plan

Based on the information from the previous section, summarized below are the main action items that should form a part of the implementation plan for the long term sustaining of the COI. This will facilitate the effective national dissemination of the project innovations.

- Continue the existing central COI.

- Ensure project management and facilitation support is available to the COI members.
- Systematically add new members and expand the number of stakeholders in the COI. This should be done in a way to ensure continuity of the productive and collaborative discussions that exist today. The recommended approach is to add new members in phases in small numbers to ensure that the current collaborative discussions continue as new members are added.
- Add regional COIs supporting the four AASHTO regions. Ensure that members from the central COI provide leadership to the regional COI groups. The current COI members were recruited to also represent the four AASHTO regions, as discussed in Chapter 5. These leaders can assist with continuing the collaboration into the regions. This balance between the central and regional groups will allow members to discuss regional challenges and brainstorm on solutions that can be championed at the regional level, while ensuring that the collaboration necessary for success of the adoption between all stakeholders continues. New successful practices identified can be added to the Collaborative Solutions Suite and made available to all users. This model ensures the exchange of ideas whereby the central COI members share the priorities discussed at the central level with the regional members and bring back and share regional issues with the central COI. The synergies can enhance the national discussion and the solutions developed while they increase the buy-in and support across the DOTs that will exponentially catalyze the adoption of best practices.
- Have a national conference every alternate year focusing on the DOT-railroad challenges and solutions. This brings the discussion to local agencies and regional and short line railroads, and completes the dissemination across the US in a systematic and sustainable way.
- Funding the COI at the central and regional level and [funding for] the conference is important to its productive working.
- Additionally, funding to support the implementation of current project innovations, as well as future new innovations, will go a long way in sustaining productive COIs at both levels. The groups will be able to successfully contribute to addressing the challenges faced on projects that will make a difference nationally. Success will beget more success. This will also set the stage for stakeholders to get engaged in finding and testing solutions to new challenges in a collaborative way.

CHAPTER 8
Lessons Learned and Recommendations from Project Work

8.1 Lessons Learned

The StarIsis project team consciously addressed the challenges identified by stakeholders in the initial research project, particularly relating to the historically contentious nature of discussions between the two entities. The teams' efforts were successful in that the numerous discussions that have taken place among the community of interest members during the course of this project occurred in an environment of collaboration and trust. These discussions provide some insight into what it takes to improve the working relationships between transportation agencies and railroad companies. It also provides some perspective on what it takes to promote a healthy relationship between these entities nationwide. The ultimate outcome of these efforts would be more streamlined delivery of projects that can be completed on schedule and within scope and budget. The lessons learned summarized below will provide guidance and recommendations to those involved in road and rail projects in implementing practices, improving coordination, and expediting project delivery. Note that the lessons learned have been broken into categories only for convenience. Many of the lessons learned span across the categories listed.

8.1.1 Success Through Collaboration

- The success of the community of interest shows that transportation agencies and railroads can work together in partnership to implement solutions that can stave off issues on projects and when issues do arise, they can collaboratively work on implementing solutions.
- Though they exist in isolated pockets, examples of successful practices do exist that address many of the common challenges across the country. Investing resources in disseminating these innovative solutions and making them readily available nationally will eliminate peers recreating similar solutions. The resources saved can be redirected to implementing the solutions.

8.1.2 Understanding Cultural Differences

- The culture and approach of the railroads to projects are different from those of public agencies. The railroads are in a mode of expansion and growth, so the factors that existed when a decision was made may not apply a year or two later. Decisions made within railroads are often quick, followed by action to implement those decisions. Therefore, once decisions are made on projects involving the two parties, implementation should follow quickly thereafter. When there is a delay between the decision and the

implementation, it is important to validate the assumptions with the railroads again, before continuing work.

- Because of the pressing needs on multiple fronts that demand attention from railroad personnel, their focus will change from the project to other important aspects of their business. This may result in railroads losing interest when there is a significant time lag between the decisions and their implementation.

8.1.3 Building Trust Is Essential

- COI members stated in various project discussions and at the May 2013 FHWA-sponsored Implementation Planning Workshop that resources need to be invested in supporting and continuing the efforts of the community of interest. Members were emphatic about it and let it be known that trust and good relationships are a key element to collaborative discussions between the two parties.
- When there is trust and respect, both railroads and agencies willingly participate in information dissemination as well as in championing and trying out successful solutions.
- Having a signed MOU between a transportation agency and a railroad will kick-start the improvement of work processes between the two parties. It will also help in clarifying roles and responsibilities and create a common understanding of expectations. The MOU will create partnership between the two organizations to facilitate continuous improvements that benefit both parties.
- Having various levels of personnel from the railroads and the transportation agencies involved in best practices and supporting the implementation effort catalyzes the implementation process.
- Once the two parties involved get comfortable with the intent and outcomes of the best practices, they are more open to implementing them.
- Having more updated master agreements improves the working relationships. Also, addressing safety aspects, such as having the appropriate permits and agreements for right-of-entry, will help with building the trust.
- Transportation agencies and railroads that have a relationship of trust often get project agreements completed much sooner than otherwise (within a period of weeks for simpler projects and months if the structure and level of project detail involved are more complex). Examples of these can be seen in Florida DOT, Iowa DOT, and North Carolina DOT.

8.1.4 Internal and External Coordination and Communication

- Early and frequent coordination by transportation agencies is important to working with the railroads.

- Transportation agencies that involve railroads early in the decision-making process often find the railroads suggesting new options to project designs that are acceptable to both parties. Such exchanges early in the project development process will eliminate the need for more expensive alternatives later in the project development process. These are win-win strategies that meet the requirements of both parties.
- The railroads' public project managers have very busy travel schedules. These managers cover multiple states; therefore, frequent follow-up from the agency will result in faster decisions.
- Annual meetings and well-planned project update meetings help open communications, while also providing a forum that enables both parties to address any miscommunications that may have occurred.
- Communicating and providing the background on best practices and getting the buy-in from both the railroad and the transportation agency representatives is the important first step to implementing any new practices.
- Internal coordination between offices and personnel within the transportation agency is also extremely important.
- Transportation agency personnel should engage the railroad divisions within the agency early in project development process. DOTs that have mature processes start this internal involvement in early planning phases when it is expected that some involvement with railroads may be needed. These agency personnel in turn can get the railroads involved early in the project process.
- Sharing best practices with local agencies makes for the use of consistent processes on projects with the railroads. The more consistent the roadway projects are, the faster the approval process becomes for the railroads. An example is the Iowa DOT instructional memorandum that provides guidance to local agencies on specifications, agreement language, and other processes on projects involving the railroads.
- In comparison to agencies where railroad expertise is spread throughout the department, transportation agencies that have consolidated the rail operations into one office or into a one-stop shop have been more successful in mitigating issues. They have also been more successful in having early coordination and frequent communication with stakeholders through the life of the project.
- With the railroads outsourcing the review of public project work, one more entity gets involved in the project. Often the transportation agencies also use consultants for plan and design development. The need for closer coordination and communication becomes further enhanced with four organizations involved versus two organizations.
- Good coordination and clear communication with the railroad is enhanced by having a single point of first contact in a transportation agency.
- Good relationships, as well as the trust that comes with them, are critical to the entire process. Having a good working relationship makes it easier to have open conversations, raise issues constructively, and find solutions collaboratively.

- Collaborating ahead with the railroad on projects can help the agency manage project costs. The railroads can suggest design options that limit costs while meeting the requirements of both parties.

8.1.5 Peer Confirmation

- The railroads are more open to reviewing solutions proposed or implemented by peers. Forums of regular contact and sharing of ideas, such as what took place with the project's COI, serve as a great platform for such peer-to-peer exchanges. These can trigger the widespread adoption of solutions already implemented by peers.
- Sharing best practices through working peer-exchange sessions between an agency that has successfully implemented a best practice and an agency that needs a solution to a similar problem is a good way to expedite the implementation of such practices and the solving of issues. Depending on the challenges being addressed, such sessions should include the railroads.
- Facilitated panel discussions involving transportation agencies and railroads showcasing successful collaborations help build the confidence in other transportation agencies and railroad pairs to test similar solutions.

8.1.6 Best Practices and Implementation

- Where progress has been limited, start with implementing simple best practices to build trust and good working relationships, and progressively move to more complex best practices.
- The use of best practices, such as a formal escalation process, goes a long way in expediting agreement processing and project delivery.
- Streamlining processes and eliminating redundancies is important to many of the processes involved.
- For transportation agencies that have millions of dollars invested in railroad projects, investing in a dedicated railroad project manager is well worth the cost. This is similar to investing in a good project manager on a highway project that does not involve railroads.
- Expect the development of master agreements to take time. Know that once a master agreement is developed, it will more than compensate for the time spent on developing it.
- Starting small and having simpler master agreements, such as with flagging or routine maintenance activities, will create the environment and set the path for more complex master agreements.
- Safety is at the top of the railroad priorities. Railroads are looking for projects that involve closing at-grade crossings or replacing grade crossings with grade separation projects. Best practices in these areas will get traction faster.

- Simplifying administrative processes, such as payment by lump-sum amounts, minimizes administrative costs and helps expedite agreement processing and delivery of projects.
- Transportation agencies such as Texas DOT are ensuring that contractors have the appropriate insurance before awarding them the contract. Such practices build confidence and trust with the railroads.
- Simplifying projects and separating those that do not need flagging services and sharing the list of such projects six months or a year ahead will eliminate the review time and expedite project work.
- Where possible, streamlining the processing of flagging agreements through the use of master flagging agreements will expedite projects.
- Other process streamlining efforts, such as coordinating flagging managed by agency contractors to avoid unnecessary requests for and unplanned dismissal of flaggers, can eliminate unnecessary costs on projects. These costs often add up to a good percentage of the project cost.
- Ensuring early coordination on all projects involving railroads, which will limit the need for expensive changes and design alternatives later in the project process. Design-build projects need special attention. Streamlining the process and starting coordination with the railroads and the design-build contractor earlier than in the traditional projects is important to the on-time, on-cost and within-scope delivery of projects.
- Improving the collection and storing of data relating to railroad crossings and other grade-separated projects helps provide better quality of data to FRA and also improves decision making.
- Using electronic agreement processing helps keep all parties informed and updated on upcoming activities. The electronic workflow can also expedite the processing of agreements.

8.1.7 Resources for Initial Implementation and Knowledge Transfer

- Providing external personnel and resources to guide the implementation of practices is important to the success of implementation. With staff turnover and downsizing, agency and railroad personnel are busy with day-to-day operations. This may result in practices not getting the necessary attention to get successfully implemented. Once a best practice is implemented and integrated into routine operations, it will require minimal additional resources and will continue to be used successfully.
- Having knowledge transfer and training of agency personnel on best practices and cultural differences of the railroads is important to successful management and expeditious delivery of projects.
- Access to a single repository of best practices and other resources will empower agency personnel and give them access to experts in other agencies who have successfully addressed similar challenges that they face.

- Without a national forum that keeps railroads and transportation agencies engaged in discussions, all parties are likely to get focused on day-to-day pressing needs and return to working in isolation. The progress made in the last several years will slowly erode and the collaboration between all the stakeholders will diminish. It is therefore imperative that appropriate resources and support be mobilized to ensure that the current spirit of cooperation is sustained.
- Having a virtual discussion forum that is monitored and managed to facilitate productive discussions that go hand-in-hand with the COI meetings will keep the community engaged and continue the discussions on new challenges that are bound to come up. Solutions can be brainstormed in facilitated COI meetings, strategies can be tested by members, and successes can be shared in the virtual forums.

8.1.8 The COI Sustaining the Collaboration

- With the right representation and facilitation, the community of interest can continue to be a great resource for enhancing existing solutions as well as developing new solutions to address common challenges. The approach to how projects are planned, designed, and constructed is changing. For example, the challenges associated with design-build projects are different from those faced on traditional projects. Similarly, the landscape of projects between transportation agencies and railroads are being influenced by factors such as global trade and industries such as new oil exploration and fracking. These reveal new challenges, and similar new challenges will arise in the future.
- The priorities and demands on the time and resources of the two organizations are very different. Without funding and the active support and engagement of an external team to facilitate meetings and keep the discussions alive, the likelihood of the group continuing to be engaged and productive as it has been in this project is very low.
- This COI can be the forum to help track the pulse and health of activities relating to projects involving transportation agencies and railroads. It can be a great forum to track new challenges and to facilitate discussions and exchanges between peers between those who have solutions and others who are looking for solutions to similar challenges.
- The COI can serve as an ongoing forum to support development and testing of new solutions. Also, having facilitated brainstorming discussions between various stakeholders will keep members engaged productively in finding solutions.
- An ongoing facilitated virtual forum for stakeholders that augments the COI discussions will facilitate frequent exchange of ideas. This will provide members the additional option of posting questions about new challenges and seeking feedback from peers who have addressed similar challenges. When effectively moderated and managed, these virtual forums can cost effectively provide solutions and enable discussions between peers.

- Using the format and approach taken in the conduct of this project, similar COI-facilitated discussions can be held and members engaged to discuss new challenges and brainstorm on solutions, as well as to volunteer and test these new solutions. The successful new solutions can then be added on a continual basis to the existing web suite of tools (the Solution Suite) that house strategies for national dissemination.

8.2 Barriers to Long-Term Success

The lessons learned section addresses many of the barriers to the long-term achievement of the project objectives. Following are some of the additional barriers identified during the COI meetings:

- Funding limitations pose major challenges to the continuation of the dissemination and to the support of the facilitated activities required to keep members engaged. With additional funding and with the right style of management, the current spirit of partnering can be leveraged for the next phase of member engagement, information dissemination, and innovation adoption.
- Delay or discontinuation of the collaboration between stakeholders developed in the project is another barrier to expedited adoption of the innovations. With the current project community of interest members from both railroads and transportation agencies, the momentum of adoption and acceptance can be carried forward successfully to the national stage. The continuation of the partnering and ongoing collaborative discussions will also allow the development of new solutions and refinement of existing solutions. Continuing the collaboration and showcasing the adoption of solutions by members will make it more attractive for other peers new to the innovations to adopt them.
- Delays in funding and support for implementation can disengage the railroads and other stakeholders. This can be addressed by expeditiously following up on implementation activities once a decision to implement a solution is made.
- Contentious relations and lack of trust between various stakeholders. This can be addressed through good facilitation and other strategies detailed earlier in the report.
- Lack of project management support can be a barrier to national deployment of the project innovations. Funding to provide project management support, follow-up, and coordination of activities between the railroads and transportation agencies is necessary to keep and build upon the buy-in achieved during the national implementation phase can help mitigate this issue.
- Lack of resources in the state DOTs for travel to conferences and meetings. This was identified as a barrier for exchange of ideas between peers. This lack of communication was leading to a silo approach to addressing challenges and resulting in limiting the implementation of innovations to the innovators.
- Lack of an online community to facilitate discussions on innovations or to trigger discussion in a continuous way. The communication and dissemination project is a one-

time event that has triggered a lot of discussion and innovation. The team identified the need for an ongoing forum for continuing the discussions between the parties.

- Lack of an updated repository of innovations. There is not one place where stakeholders can go to get information on all the innovations (best practices, streamlined processes, and model agreements). The team explained that many of these issues relating to a single repository will get resolved in the next phase of the SHRP 2 project.
- Lack of a single updated source of contact information about DOT-railroad subject matter experts.
- Reduction in DOT resources resulting in lack of internal resources to focus on internal innovation. Most of the resources are focused on keeping day-to-day operational activities going.
- Lack of facilitated peer-exchange forums and no resources to assist with beta testing of innovations from the innovation catalogue.
- Reduction in federal funding for safety and other railroad–DOT efforts.

References

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Abbreviations and Acronyms

AAR—Association of American Railroads
AASHTO—American Association of State Highway and Transportation Officials
AREMA—American Railway Engineering and Maintenance-of-Way Association
ARRA—American Recovery and Reinvestment Act
ASCE—American Society of Civil Engineers
BNSF—Burlington Northern Santa Fe Railway
Caltrans—California Department of Transportation
CDOT—Colorado Department of Transportation
Central COI—central community of interest
Champion pair—a pairing of a state DOT and a Class I/II railroad to apply and pilot test the results of the Railroad–DOT Mitigation Strategies project
CN—Canadian National COI—
Community of Interest
Collaborative Solutions Suite—several tools developed as part of the SHRP 2 Projects on Railroad–DOT Mitigation Strategies, which include several training lessons, a library of resources, and a web tool
CREATE—A Union Pacific project in the Chicago area involving investments on rail projects.
CSX—CSX Railroad
D-B—design-build DOT—
Department of Transportation
FDOT—Florida Department of Transportation
FEC—Florida East Coast Railroad FHWA—
Federal Highway Administration FRA—Federal
Railroad Administration FTA—Federal Transit
Administration G&W—Genesee & Wyoming
Railroad HOV—High Occupancy Vehicle
LDTD—Louisiana Department of Transportation and Development
MAASTO—Mid America Association of State Transportation Officials
MIT—Manitoba Infrastructure and Transportation MOU—
Memorandum of Understanding
MPO—Metropolitan Planning Organization NCDOT—
North Carolina Department of Transportation
NCUTCD—National Committee on Uniform Traffic Control Devices NEPA—
National Environmental Policy Act
NS—Norfolk Southern Railroad
Partnering MOU—partnering memorandum of understanding PSA—
Public Service Announcement

Regional COI—regional community of interest
RPO—rural planning organization
SASHTO—Southeastern Association of State Highway and Transportation officials SCORT—AASHTO's Standing Committee on Rail
TSP 2—Transportation System Preservation Technical Services Program UP—Union Pacific Railroad
WASHTO—Western Association of State Highway and Transportation Officials WSDOT—Washington State Department of Transportation