

MULTIMODAL COORDINATED PROJECT PLANNING

Task 5 – Summary Report

Prepared for

National Cooperative Highway Research Program

Transportation Research Board

of

The National Academies of Sciences, Engineering, and Medicine

Cambridge Systematics, Inc.
Cambridge, MA
August 28, 2017

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Abstract

This report synthesizes and presents the practice of multimodal coordination across state Departments of Transportation (DOT), metropolitan planning organizations (MPO), and regional transit agencies. This synthesis highlights examples of successful agency coordination to implement multimodal projects (and in some cases multimodal practices) that include both roadway and transit improvements. This project also considered the role of state DOTs in delivering or assisting in the delivery of multimodal transportation solutions, and makes recommendations for federal guidance to better support coordination for multimodal projects.

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FINAL SUMMARY REPORT

Best Practices to Coordinate, Plan, and Implement Multimodal Projects

Summary

The purpose of research conducted for NCHRP 20-65, Task 67 was to synthesize the practice of multimodal coordination across state Departments of Transportation (DOT), metropolitan planning organizations (MPO), and regional transit agencies. This synthesis highlights examples of successful agency coordination to implement multimodal projects (and in some cases multimodal practices) that include both roadway and transit improvements. This project also considered the role of state DOTs in delivering or assisting in the delivery of multimodal transportation solutions.

The research began with a scan of summarized literature related to multimodal transportation planning, particularly the best practices in coordination across transportation agencies and partners as they relate to multimodal coordinated project planning. Next, the Cambridge Systematics research team conducted more than a dozen preliminary investigative interviews and five panel interviews to inform the research and to prepare six case studies regarding the context, coordination, and outcomes that define these multimodal projects. The panel participants included key coordination partners such as DOTs, MPOs, transit agencies, and city transportation and public works departments.

The results of this research is the examination, documentation and communication of successful coordination strategies, tools and approaches for multimodal projects which can be duplicated in a variety of contexts and geographies to promote solutions that benefit multiple stakeholders. Technical transfer materials designed for web friendly publication include a Quick Reference Guide: Best Practices for Coordination to Plan and Implement Multimodal Project, a Flyer that summarizes the project and lessons learned and a Microsoft PowerPoint Slide Deck that stakeholders can use to share lessons within their organizations. These materials can be found in the Appendices to this Report and online at the following website: <http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4156>.

This project was managed by the NCHRP, and overseen by the NCHRP Panel for Research, for the AASHTO Standing Committee on Public Transportation.

Key Findings – Literature Review

The literature review revealed four findings common to all successful project planning, development, implementation, and multiagency coordination:

- **Shared Vision and Goals:** Develop a method to establish and share common vision and goals, allowing a connection between planning and operations across departments and agencies and supporting open communication and cooperation. The shared vision can also support an organizational culture shifting focus from automobile and highway improvements to investments towards alternative modes of transportation.
- **Consolidated Operations and Organization:** Organize intra-agency departments to maximize efficiency and support multimodal discussion and collaboration. Support by strong leadership at all levels of government can further improve collaboration and coordination within an agency.

- **Shared Data and Information:** Ensure staff have adequate data, analysis, and decision-making tools across multiple modes and departments. Shared data can also monitor performance measures and support solutions and initiatives that require cooperation from multiple departments and agencies.
- **Dedicated Funding Source:** A lack of flexible funding across modes was identified as a major barrier for multiple coordination and projects. Finding or developing a sustainable and committed funding source for operations, maintenance, and capital projects can streamline the process and make them more viable.

In addition to these four frequent findings, the literature summarized other key topics and initiatives to help support successful coordination for multimodal planning and projects, including:

- Supporting opportunities for collaboration among a wide variety of documents, studies and projects;
- Gauging the political climate and governance, which could support or discourage multimodal projects;
- Considering unique contracting practices, such as a design-build approach, to shorten project construction and planning;
- Maintaining communication and supporting activities and initiatives involving the community and stakeholders;
- Finding a specific person or organization to serve as the leader of the effort and spearhead the initiative;
- Using momentum from previously successful multimodal projects for other initiatives; and
- Establishing supportive policies and legislation.



Key Findings – Case Studies

Best practices for the coordination of multimodal projects and processes were drawn from six case studies. Some of the case studies exemplify how state and local agencies found a common vision, leveraged resources, and overcame challenges to jointly deliver a successful project. Other case studies focus on emerging processes within local and state agencies which involve transit and other modes to be part of a performance based solution.

These real-world applications found in these practices can be transferred to peer agencies across the country to inform and guide coordination challenges faced in their respective communities and to plan and implement multimodal projects. Agencies can share and discuss these strategies with current and future planning partners and jointly begin to identify the key coordination aspects, components, roles, tools, methods, and lessons learned to implement future projects.





Challenges: Obstacles to Coordination. Each case study includes a discussion of key obstacles to coordination the project teams faced, and some of the steps taken to address those challenges. Research and interviews with the case study panels indicated that key challenges faced in Coordination for Multimodal Projects includes the following:

- Coordination for such projects is complicated and can be difficult – everyone needs to be on the same page as projects advance.
- Compromise is often required to stay on schedule and have a good project, if not “perfect” in the mind of each person involved in project development.
- It is essential to effectively conduct coordinated public outreach to key stakeholders to help them understand the value of the project within the regional context and to gather their input. It can be very challenging to relay information that is accurate yet digestible by the public.
- Legal proceedings for the transfer and use of funds can be a significant obstacle.
- Compliance with inconsistent state, Federal Highway Administration (FHWA), and Federal Transit Administration (FTA) requirements is very challenging. Understanding and ensuring compliance with requirements can put forth a significant burden on staff time or can result in extra cost due to contracting support to meet requirements.
- In some projects, one agency needs to cede control to other agencies, this requires trust and confidence building to establish effective coordination.
- There are typically insufficient funding programs for transit projects.
- Correctly identifying partners and ensuring their involvement early in the project had been a common problem in past projects.

Lessons Learned. The research into case studies identified a number of effective practices for coordinating multimodal projects. Key practices for successful multimodal coordinated project planning that arose as themes in the panel interviews include:

- In person meetings are critical, as the relationships that are developed are the backbone to successful project planning and delivery.
- The team recognized the difference between coordination and collaboration. Coordination is keeping the team up to date and involved in conversations. But collaboration involves organizations from ground up, with everyone involved every step of the way and planning and implementing together.
- One or more strong champions for a project – from an agency, or national, regional, or local political representatives can be very useful to implementing a project. (e.g., In New Mexico, the Governor said ‘we’ve studied this for years, now get it done’; in Cleveland, RTA championed and brought local governments together).
- When agencies are on the same page, project coordination is smoother. Common goals are identified, shared and agencies work together to advance the project to support a shared outcome. The linkage is not only crucial at a staff level but at the executive level and for public support. This can help project staff see the value of the various aspects of the project and allow them to overcome challenges as a group.
- Adaptable roles for each agency depending on where they were in the process. The lead agency was willing to step back during certain phases to allow another agency to take the reins (for example in New Mexico the MPO fulfilled the lead coordination and outreach role for a portion of the project).
- Align the multimodal project with existing planning process whenever possible – demonstrate how the project helps to achieve regional goals (e.g., In Eugene, OR, the City of Eugene and Lane Transit District initiated a coordinated planning process, MovingAhead Bus Rapid Transit Project; In Santa Fe, NM, the MPO board weighed in heavily during station location process; in Seattle,

WA, Puget Sound Regional Council (PSRC) was kept informed of progress and also developed travel time reports that helped make the case for transit bypass).

- Remember to ask why things are done the way they are and do not be afraid to change them. Also try to break down any barriers of miscommunication inside organizations to ensure that you keep moving the conversation forward. General willingness and spirit among agencies to “try something new” can lead to productive coordination (In Seattle, WA individuals were recruited to participate in the process based on these traits).
- Implementing multimodal projects is far better in the collaborative process; it is not always a win-win situation, so both agencies need flexibility to be successful. At first glance, collaboration might seem a lot of work. Collaboration can be more work up front but can illuminate where you want to go through the process more quickly. Coordination and collaboration can be daunting but can ultimately achieve things faster.
- Interagency face to face outreach must be prioritized early on – this is resource intensive upfront but it is very important for project success and effective use of funds over the long run.
- Ensure you have a file sharing system that can be accessed by all partners (state, city, consultants) as such systems can greatly support coordination. Database management tools can be helpful and carry other institutional knowledge.
- Instead of having one overarching Memorandum of Understanding (MOU) between agencies for all project components, streamline the process by introducing multiple MOUs for each individual project (e.g., (Transit Signal Priority) TSP, bike lanes, bike share, etc.). Having an overarching MOU means that if something changes in one project then it holds up the MOUs for all projects.
- Have a legal coordination team in parallel to the project to build relationships and enable adjustments to legal documents in a shorter amount of time.
- Projects cannot have enough coordination, both at the staff level and at the Manager and Executive level, and should be face to face as much as possible.

From these individual case study lessons three primary, consistent themes emerged which are instructive for transportation leaders and practitioners expecting to start their own multimodal project. Each theme and ensuring lessons are described in more detail in the following section.

Meeting In-Person Still Matters in the Digital Age. In-person meetings are critical, as the relationships that are developed are the backbone to successful project planning and delivery. All case study participants underscored the value of in-person meetings, as relationship development is key to trust, compromise, and proactive coordination to address challenges. The Maryland Department of Transportation – Maryland Transit Administration (MDOT-MTA) communicated that frequent in-person meetings and early coordination – at the staff and manager/executive level – were essential to success of the BaltimoreLink project. They found this face-to-face time invaluable and committed to biweekly meetings with the MDOT Secretary’s Office (TSO) and MDOT-MTA leadership throughout the duration of the project. This included the MDOT Secretary of Transportation, Office of Planning and Capital Programming, Office of Public Affairs, and Office of Real Estate and the MDOT-MTA Administrator and Chief Operating Office. The MDOT-MTA Director provided an update to this group, who in turn discussed key issues and concerns.



The MDOT-MTA practiced coordination approaches that went beyond traditional meetings. They conducted several large, day-long workshops for all agencies involved in the BaltimoreLink project. The workshops’ purpose was to bring all working groups and organizations ‘up to speed’, with each topical focus group presenting the progress of subprojects and plans. The workshops provided a chance to ensure that everyone had access to all planning and construction updates and that plans and project components

aligned. The MDOT-MTA employed strategies to ensure the workshops were interactive and to guarantee that each group could gather ideas from all partners to align and improve the Plan. These workshops were modeled after a strategic planning concept, to break down silos and bring everyone up to the same level of knowledge across the project as a whole. Similarly the City of Eugene staff and Lane County Transit District (LTD) staff in the Oregon Moving Ahead Bus Rapid Transit project process found in-person and weekly meetings critical to developing relationships and discussing regional priorities, and projects.

Be Flexible and Ready to Adapt. Flexibility, adaptability, and collaboration are critical to coordination for multimodal projects. Participating agencies for multimodal projects found flexibility and adaptability as vital to support project progress and evolution. This included adapting to changing roles – in some cases ceding a lead role (during a particular phase) to another agency in order to achieve broader, comprehensive results. For example, during the latter stages of the South Capitol Rail Runner Station project the Mid-Region Council of Government (MRCOG) took on a lead coordination role allowing it to operate with fewer restrictions than the project lead (New Mexico Department of Transportation (NMDOT)). This streamlined and enhanced the completion of the public outreach process.

Collaboration is not simply information sharing but also wisely drawing upon the strengths of each individual agency and expertise from the ground up to navigate complex project issues and foster solutions together. Understanding past agency coordination history, including a review of project development and implementation, can help avoid previous pitfalls and generate new approaches. The collaboration could be formalized through memorandum of understanding for all project components or remain an informal commitment built on mutual trust to overcome communication barriers, external pressures, and stick together through project completion.



The Clifton Boulevard Transportation Enhancement Project brought together communities who at first had competing aspirations for the corridor. However the process of working through a respected party (Greater Cleveland Regional Transit Authority) and openly discussing differences led to success and trust in partnering on shared responsibilities. Coordination and collaboration can be daunting, especially if parties must first work through past broken history, however these case studies prove the up-front time/energy invested to determine how to work together translates into future project success and effective use of funds.

Aligning Goals. Align the multimodal project with the existing planning process whenever possible; define common goals for the project and demonstrate how the project will support regional goals. When agencies are ‘on the same page’ project coordination is smoother. This is especially true for coordinating multimodal projects between state DOT and local agencies as the project should be developed to support mutual goals. Taking this action can help project staff see the value of the various aspects of the project and allow them to overcome challenges together. The linkage to regional goals is critical for building broader communication with the executive level, external stakeholders, and public.

While this theme of aligning goals was common across case studies, the Moving Ahead Bus Rapid Transit project process in Eugene, Oregon provides a clear demonstration of this concept. The City of Eugene and Lane Transit District leveraged the lessons learned from the implementation of the three initial corridors of the Emerald Express (EmX) Bus Rapid Transit system to develop the concept for the project, a collaborative planning process used in the Moving Ahead Bus Rapid Transit project. This BRT project involves working with the community and stakeholders to prioritize multiple corridors simultaneously for near-term transit, bicycle, and pedestrian infrastructure enhancements. In the past, these project types were implemented independently, rather than in a coordinated fashion. A key value of the Moving Ahead BRT project is the coordination of transit and future land use assumptions. Another purpose of the project is to make clear how transit projects support regional economic, quality of life, and mobility goals, building from and implementing the local range plans, Envision Eugene and LTD’s Long Range Transit Plan.

Background

Research Purpose

Purpose

The purpose of research conducted for NCHRP 20-65, Task 67 was to synthesize the practice of multimodal coordination across state Departments of Transportation (DOT), metropolitan planning organizations (MPO), and regional transit agencies. This synthesis highlights examples of successful agency coordination to implement multimodal projects (and in some cases multimodal practices) that include both roadway and transit improvements. This project also considered the role of state DOTs in delivering or assisting in the delivery of multimodal transportation solutions.

Research Approach

Literature Review: The research began with a scan of summarized literature related to multimodal transportation planning, particularly the best practices in coordination across transportation agencies and partners as they relate to multimodal coordinated project planning. The review which can be found in Appendix A is organized into three sections, 1) a profile of select literature; 2) a summary of the literature; and 3) key findings. The literature profiles are organized into the following categories: General Multimodal Coordination; Collaboration and Coordination in Transportation Planning; and literature with a Specific Focus on Corridors, Metropolitan Regions, MPOs, and Modes.

The review provides a summary of the following information:

- Location and agencies;
- Types of multimodal projects;
- Types of multimodal coordination; and
- A brief summary of key findings.

Interviews and Case Studies: CS conducted more than a dozen preliminary investigative interviews and five panel interviews to inform the research and to prepare six case studies regarding the context, coordination, and outcomes that define these multimodal projects. The panel participants included key coordination partners such as DOTs, MPOs, transit agencies, and city transportation and public works departments.

The results of this research is the examination, documentation and communication of successful coordination strategies, tools and approaches for multimodal projects which can be duplicated in a variety of contexts and geographies to promote solutions that benefit multiple stakeholders. This project was managed by the NCHRP, and overseen by the NCHRP Panel for Research, for the AASHTO Standing Committee on Public Transportation.

Webinars: CS conducted two webinars as part of this research. The first served the purpose of providing an overview of the technical transfer documents to the NCHRP Panel, Case Study Participants, and invited State DOTs. The purpose of the second webinar was to communicate findings of the research to stakeholders across the country that would benefit from the research and to make them aware of the various forms in which the research results are made available through the technical transfer documents.

This approach was designed as a series of building blocks with key findings from each step informing the next. Specific key findings and ones common across the research are described next in more detail.

Key Findings

Key Findings – Literature Review

The literature review discovered four findings common to all successful project planning, development, implementation, and multiagency coordination:

- **Shared Vision and Goals:** Develop a method to establish and share common vision and goals, allowing a connection between planning and operations across departments and agencies and supporting open communication and cooperation. The shared vision can also support an organizational culture shifting focus from automobile and highway improvements to investments towards alternative modes of transportation.
- **Consolidated Operations and Organization:** Organize intra-agency departments to maximize efficiency and support multimodal discussion and collaboration. Support by strong leadership at all levels of government can further improve collaboration and coordination within an agency.
- **Shared Data and Information:** Ensure staff have adequate data, analysis, and decision-making tools across multiple modes and departments. Shared data can also monitor performance measures and support solutions and initiatives that require cooperation from multiple departments and agencies.
- **Dedicated Funding Source:** A lack of flexible funding across modes was identified as a major barrier for multiple coordination and projects. Finding or developing a sustainable and committed funding source for operations, maintenance, and capital projects can streamline the process and make them more viable.



In addition to these four frequent findings, the literature summarized other key topics and initiatives to help support successful coordination for multimodal planning and projects, including:

- Supporting opportunities for collaboration among a wide variety of documents, studies and projects;
- Gauging the political climate and governance, which could support or discourage multimodal projects;
- Considering unique contracting practices, such as a design-build approach, to shorten project construction and planning;
- Maintaining communication and supporting activities and initiatives involving the community and stakeholders;
- Finding a specific person or organization to serve as the leader of the effort and spearhead the initiative;
- Using momentum from previously successful multimodal projects for other initiatives; and
- Establishing supportive policies and legislation.

Key Findings – Case Studies

Best practices for the coordination of multimodal projects and processes were drawn from six case studies. Some of the case studies exemplify how state and local agencies found a common vision, leveraged resources, and overcame challenges to jointly deliver a successful project. Other case studies focus on emerging processes within local and state agencies which involve transit and other modes to be part of a performance based solution.

These real-world applications found in these practices can be transferred to peer agencies across the country to inform and guide the coordination challenges faced in communities, to plan and implement multimodal projects. Agencies can share and discuss these strategies with current and future planning

partners and jointly begin to identify the key coordination aspects, components, roles, tools, methods, and lessons learned to implement future projects.



Challenges: Obstacles to Coordination. Each case study includes a discussion of key obstacles to coordination the project teams faced, and some of the steps taken to address those challenges. Coordination for projects with many aspects of the project can be difficult – everyone needs to be on the same page as projects advance. Research and interviews with the case study panels indicated that key challenges faced in Coordination for Multimodal Projects include:

- Compromise is often required to stay on schedule and have a good project, if not “perfect” in the mind of each stakeholder.
- It is essential to effectively conduct coordinated public outreach to key stakeholders to help them understand the value of the project within the regional context and to gather their input. It can be very challenging to relay information that is accurate yet digestible by public.
- Legal proceedings for the transfer and use of funds can be a significant obstacle.
- Compliance with inconsistent state, FHWA, and FTA requirements is very challenging. Understanding and ensuring compliance with requirements can put forth a significant burden on staff time or can result in extra cost due to contracting support to meet requirements.
- In some projects, one agency needs to cede control to other agencies, this requires trust and confidence building to establish effective coordination.
- There are typically insufficient funding programs for transit projects.
- Correctly identifying partners and ensuring their involvement early in the project had been a common problem in past projects.



Summary of Lessons Learned

The research into case studies identified a number of effective practices for coordinating multimodal projects. Key practices for successful multimodal coordinated project planning that arose as themes in the panel interviews include:

- In person meetings are critical, as the relationships that are developed are the backbone to successful project planning and delivery.

- The team recognized the difference between coordination and collaboration. Coordination is keeping the team up to date and involved in conversations. But collaboration involves organizations from ground up, with everyone involved every step of the way and planning and implementing together.
- One or more strong champions for a project – from an agency or national, regional, or local political representatives can be very useful to implementing a project. (e.g., In New Mexico, the Governor said ‘we’ve studied this for years, now get it done’, in Cleveland, RTA was champion).
- When agencies are on the same page, project coordination is smoother: identify common agency goals and how that project can support those goals. Make that linkage now only at staff level, but at the executive level, and for the public. This can help project staff see the value of the various aspects of the project and allow them to overcome challenges as a group.
- Adaptable roles for each agency depending on where they were in the process. The lead agency was willing to step back during certain phases to allow another agency to take the reins. (e.g., In NM the MPO took coordination and outreach role for a portion of the project).
- Align the multimodal project with existing planning process whenever possible – demonstrate how the project helps to achieve regional goals (e.g., In Eugene, OR, the City of Eugene and Lane Transit District initiated a coordinated planning process, MovingAhead Bus Rapid Transit Project; In Albuquerque, NM, the MPO board weighed in heavily during station location process; in Seattle, WA, Puget Sound Regional Council (PSRC) was kept informed of progress and also developed travel time reports that helped make the case for transit bypass).
- Remember to ask why things are done the way they are and do not be afraid to change them. Also try to break down any barriers of miscommunication inside organizations to ensure that you keep moving the conversation forward. General willingness and spirit among agencies to “try something new” can lead to productive coordination (In Seattle, WA individuals were recruited to participate in the process based on these traits).
- Implementing multimodal projects is far better in the collaborative process; it is not always a win-win situation, so both agencies need flexibility to be successful. At first glance, collaboration might seem a lot of work. Collaboration can be more work up front but can illuminate where you want to go through the process more quickly. Coordination and collaboration can be daunting but can ultimately achieve things faster.
- Interagency face to face outreach must be prioritized early on – this is resource intensive upfront but it is very important for project success and effective use of funds.
- Ensure you have a file sharing system that can be accessed by all partners (state, city, consultants), as these file sharing systems can greatly support coordination. Database management tools can be helpful and carry other institutional knowledge.
- Instead of having one overarching MOU between agencies for all project components streamline the process by designing multiple MOUs for each individual project (e.g., TSP, bike lanes, bike share, etc.). The risk of having an overarching MOU means that if something changes in one project then it holds up the MOUs for all projects.
- Have a legal coordination team in parallel to the project to build relationships and enable to make adjustments to legal documents in a shorter amount of time.
- Projects cannot have enough coordination, both at the staff level and at the Manager and Executive level, and should be face to face as much as possible.

These individual lessons learned could be viewed within three overarching, recurring themes across the six case studies. Each theme and the correlating case studies lessons which support them are highlighted as follows:

Meeting In-person Still Matters in the Digital Age. In-person meetings are critical, as the relationships that are developed are the backbone to successful project planning and delivery. All case study participants underscored the value of in-person meetings, as relationship development is key to trust, compromise, and proactive coordination to address challenges. The Maryland Department of Transportation – Maryland Transit Administration (MDOT-MTA) communicated that frequent in-person meetings and early coordination – at the staff and manager/executive level – were essential to success of the BaltimoreLink project. They found this face-to-face time invaluable and committed to biweekly meetings with the MDOT Secretary’s Office (TSO) and MDOT-MTA leadership throughout the duration of the project. This included the MDOT Secretary of Transportation, Office of Planning and Capital Programming, Office of Public Affairs, and Office of Real Estate and the MDOT-MTA Administrator and Chief Operating Office. The MDOT-MTA Director provided an update to this group, who in turn discussed key issues and concerns.



The MDOT-MTA practiced coordination approaches that went beyond traditional meetings. They conducted several large, day-long workshops for all agencies involved in the BaltimoreLink project. The workshops’ purpose was to bring all working groups and organizations ‘up to speed’, with each topical focus group presenting the progress of subprojects and plans. The workshops provided a chance to ensure that everyone had access to all planning and construction updates and that plans and project components aligned. The MDOT-MTA employed strategies to ensure the workshops were interactive and to guarantee that each group could gather ideas from all partners to align and improve the Plan. These workshops were modeled after a strategic planning concept, to break down silos and bring everyone up to the same level of knowledge across the project as a whole. Similarly the City of Eugene staff and Lane County Transit District (LTD) staff in the Oregon Moving Ahead Bus Rapid Transit project process found in-person and weekly meetings critical to developing relationships and discussing regional priorities, and projects.

Be Flexible and Ready to Adapt. Flexibility, adaptability, and collaboration are critical to coordination for multimodal projects. Participating agencies for multimodal projects found flexibility and adaptability as vital to support project progress and evolution. This included adapting to changing roles – in some cases ceding a lead role (during a particular phase) to another agency in order to achieve broader, comprehensive results. For example, during the latter stages of the South Capitol Rail Runner Station project the Mid-Region Council of Government (MRCOG) took on a lead coordination role allowing it to operate with fewer restrictions than the project lead (New Mexico Department of Transportation (NMDOT)). This streamlined and enhanced the completion of the public outreach process.

Collaboration is not simply information sharing but also wisely drawing upon the strengths of each individual agency and expertise from the ground up to navigate complex project issues and foster solutions together. Understanding past agency coordination history, including a review of project development and implementation, can help avoid previous pitfalls and generate new approaches. The collaboration could be formalized through memorandum of understanding for all project components or remain an informal commitment built on mutual trust to overcome communication barriers, external pressures, and stick together through project completion.



The Clifton Boulevard Transportation Enhancement Project brought together communities who at first had competing aspirations for the corridor. However the process of working through a respected party (Greater Cleveland Regional Transit Authority) and openly discussing differences led to success and trust in partnering on shared responsibilities. Coordination and collaboration can be daunting, especially if parties must first work through past broken history, however these case studies prove the up-front time/energy invested to determine how to work together translates into future project success and effective use of funds.

Aligning Goals. Align the multimodal project with the existing planning process whenever possible; define common goals for the project and demonstrate how the project will support regional goals. When agencies are ‘on the same page’ project coordination is smoother. This is especially true for coordinating multimodal projects between state DOT and local agencies as the project should be developed to support mutual goals. Taking this action can help project staff see the value of the various aspects of the project and allow them to overcome challenges together. The linkage to regional goals is critical for building broader communication with the executive level, external stakeholders, and public.

While this theme of aligning goals was common across case studies, the Moving Ahead Bus Rapid Transit project process in Eugene, Oregon provides a clear demonstration of this concept. The City of Eugene and Lane Transit District leveraged the lessons learned from the implementation of the three initial corridors of the Emerald Express (EmX) Bus Rapid Transit system to develop the concept for the project, a collaborative planning process used in the MovingAhead Bus Rapid Transit project. This BRT project involves working with the community and stakeholders to prioritize multiple corridors simultaneously for near-term transit, bicycle, and pedestrian infrastructure enhancements. In the past, these project types were implemented independently, rather than in a coordinated fashion. A key value of the MovingAhead BRT project is the coordination of transit and future land use assumptions. Another purpose of the project is to make clear how transit projects support regional economic, quality of life, and mobility goals, building from and implementing the local range plans, Envision Eugene and LTD’s Long Range Transit Plan.

Case Study Organization

The following sections provide information about the six Case Studies conducted for this research project, including the following:

- City of Eugene, Oregon and Lane Transit District (LTD): MovingAhead Bus Rapid Transit Project;
- Maryland DOT – Maryland Transit Administration: BaltimoreLink;
- Washington State DOT: I-5 Transit Bypass Project (Bus on Shoulder) and Practical Solutions;
- Greater Cleveland (Ohio) Regional Transit Authority (RTA): Clifton Boulevard Transportation Enhancement Project;
- New Mexico (Santa Fe): South Capitol Rail Runner Station; and
- DART: Integrated Corridor Management, U.S.-75, Dallas Region.

For each case study, the following information is provided:

- Project Leads and Key Stakeholders;
- Project Website;
- Project Summary;
- Challenges to Coordination;
- Coordination Process and Tools;
- Summary Table
- Role of the State DOT to Assist in the Delivery of Multimodal Transportation Solutions; and
- Lessons Learned.

The following icons represent modes included the case studies:



Case Study: City of Eugene, Oregon and Lane Transit District (LTD) | Emerald Express BRT/Moving Ahead Bus Rapid Transit project¹

The MovingAhead Bus Rapid Transit project, underway as of summer 2017, is an excellent demonstration of learning from past project implementation challenges and evolving planning processes and partnerships to improve multimodal project coordination. This project is a good example of how a jurisdiction and transit agency can coordinate bicycle and pedestrian projects into transit projects and across the transit system. It also identifies several areas where the Oregon Department of Transportation (ODOT) supported implementation of the BRT and Moving Ahead Bus Rapid Transit projects. A portfolio-based approach to planning employed by LTD and the City of Eugene is summarized at the end of this case study. The case study project includes the following transportation modes:



Project Leads and Key Stakeholders

Lane Transit District, the Cities of Eugene and Springfield, the Lane Council of Governments, and the local community were involved in the implementation of these routes, building off of the State’s support for multimodal projects since the mid-1990s. Many successful projects have a ‘champion’. For Moving Ahead, a benefit of this project is its collaborative nature, therefore, there is not one agency ‘leading’ nor one champion. It wasn’t a ‘one leader – the rest follow’ type of situation, agency staff indicate. Instead, staff from LTD and the City of Eugene banded together to jointly manage and support the MovingAhead BRT project as expansion of BRT and bicycle/pedestrian facilities. They all saw approaching this together as a necessity. They were joint champions.

The MovingAhead Bus Rapid Transit project is a good example of how a jurisdiction and transit agency can coordinate bicycle and pedestrian projects into transit projects and across the transit system.

Primary Agencies

- **Lane Transit District (LTD)** – For the MovingAhead BRT Project, LTD is a project sponsor and project management responsibilities in collaboration with the City of Eugene.
- **The Cities of Eugene and Springfield** – The Cities are responsible for planning and programming for roadway, bicycle, and pedestrian projects. For the MovingAhead BRT project, the City of Eugene is the project sponsor and has project management responsibilities in collaboration with LTD. Springfield is not part of the Moving Ahead Bus Rapid Transit project as the Springfield BRT system is largely built out.
- **Lane Council of Governments (Central Lane MPO)** – Because of the NEPA process, Federal guidelines require the MPO to be involved in the selection of a locally preferred alternative. Many of the processes have to be approved by the MPO. The MPO also funded some public outreach. They helped implement the transit vision, represented broader communities for specific corridors, and participated in project management/documentation work. The MPO has regional meetings

¹ As of writing this document, the MovingAhead BRT project is underway.

every week, where participants not directly participating in committees can get project updates. The MPO meetings are a good place for different agencies to come together, develop relationships, and share information.

- **Oregon DOT** – ODOT participates in the MovingAhead BRT project and is always active in the local agencies' processes. The DOT has an organization structure where an ODOT representative is available to talk on day to day basis.
- The Eugene City Council and LTD Board – Final decision-makers on the project.
- **The Main Street Governance Team** – Project guidance as jurisdictional representatives, and dispute resolution body. Adopted formal protocols for operation and decision-making.
- **Stakeholder Advisory Committee** – Designed to be representative of community-wide and corridor interests. Role to advise the CC and LTD Board on the decision to pursue a project or not.
- **Community and business leaders** – early conversations to test the waters for a project.
- **Better Eugene Springfield Transit (BEST)** – Formed as counter to West Eugene EmX project opponents, broadened role over time into metro-wide role and took on roadway safety.
- **Fronting business and property owners** – Specifically involved as those potentially or perceived to be most negatively impacted.

Project Summary

Lane Transit District (LTD) is the transit operator in Lane County, Oregon, primarily operating in the metropolitan areas of Eugene and Springfield. In addition to fixed bus routes and ADA service, LTD operates two bus rapid transit (BRT) lines, with a third set to open in fall of 2017. LTD started operating BRT, called Emerald Express (EmX), in 2007, connecting key destinations throughout the region. LTD, the Cities of Eugene and Springfield, the Lane Council of Governments, and the local community were involved in the implementation of these routes, building off of the state's support for multimodal projects since the mid-1990s.



After receiving significant resistance to previous BRT projects from stakeholders such as local businesses, LTD and the cities learned numerous lessons from implementation of the first EmX lines, including that transit projects need to be coordinated and supportive of larger regional planning efforts and coordinated with future land use. They also learned that having the City be a key lead in transit project implementation is beneficial, and that outreach to local businesses must be direct and targeted. The cities and LTD staff have learned that the system needs to be planned holistically, together, considering all modes. See the Portfolio Management concept described at the end of this case study for an evolving approach to holistic corridor planning. The lessons from EmX implementation led to the MovingAhead Bus Rapid Transit project, a collaborative project of the City of Eugene and LTD to work with the community and stakeholders to prioritize corridors for near-term transit, bicycle, and pedestrian infrastructure enhancements. In the past, these project types were implemented independently, rather than in a coordinated fashion.

LTD, the City of Eugene, and partners are working together to help the public understand the nature of partnership; they need to continue education that Moving Ahead Bus Rapid Transit project is not only a LTD project, but is also owned by the City of Eugene. There was a change in branding to demonstrate this unity, strategically showing that the City of Eugene and LTD joined together to implement this project. The MovingAhead BRT project logo and brand displays this partnership: this is a clearing house for transit/bike/pedestrian solutions for the entire community, not just one agency.

A key value of the MovingAhead BRT project is the coordination of transit and future land use assumptions, providing mobility to corridors with greatest growth in population and employment. Another purpose of the project is to make clear how transit projects support regional economic, quality of life, and mobility goals, building from and implementing the local plans, Envision Eugene and LTD's Long Range Transit Plan. As of writing this document (Summer 2017), the MovingAhead BRT project is underway.

Challenges

The MovingAhead Bus Rapid Transit Project was designed to address challenges that the agencies had encountered in the past. Some of the past challenges the agencies encountered when planning and implementing previous bus rapid transit projects included:

- Different agencies have different impact priorities and goals – this must be managed during the planning and project development phase.
- Distinguishing between short term construction impacts and long term benefits for impacted stakeholders is difficult. These impacts/benefits may be different and businesses are not always concentrating on long term benefits but how those few months of construction with impact them and customer's access to businesses.
- Agencies need to do everything in their power to reduce impacts to business, such as construction during off hours, providing driveways to enable access to businesses, providing advertisement (including directional signs to businesses), and even offering business classes to owners.
- As the BRT lines were implemented by LTD, which does not have land use authority, LTD could not ensure bicycle, pedestrian, and other land use improvements that provide better access to and walkable environments near transit were coordinated with the transit investment (This challenge was one motivation for Moving Ahead Bus Rapid Transit project). It was difficult to determine how to fund projects supporting the transit investment due to lack of coordinated planning for EmX 'Western Line' (e.g., bicycle and pedestrian improvements that provide local connectivity near transit).
- There were concerns with coordination that occurred late in the process, as new bicycle/pedestrian project components could jeopardize the larger project. In the past, LTD only looked at transit projects. Prior to the MovingAhead BRT project coordination, when the City of Eugene attempted to do master planning on the Greenline, there was an effort to

Different agencies have different impact priorities and goals – this must be managed during the planning and project development phase.



coordinate projects, to some degree, but there was not a strong consideration for bicycle/pedestrian improvements.

- There was a lack of public support due to insufficient regional planning and outreach for the Western Eugene EmX. LTD was not able to demonstrate how the transit line benefitted regional goals because the BRT had not been a key part of the previous regional planning process.
- There is generally insufficient funding programs for transit projects.
- Adding the multimodal conversations does complicate the concept design, NEPA process, and how to fund a project. A big obstacle is that funding may not be available for multimodal projects but – this challenge provides an opportunity for states and the Federal government to be stronger partners by making multimodal project funding available.

Coordination Processes and Tools

The lessons from EmX implementation led to MovingAhead Bus Rapid Transit project, a collaborative project of the City of Eugene and LTD to work with the community and stakeholders to prioritize corridors for near-term transit, bicycle, and pedestrian infrastructure enhancements. In the past, these project types were implemented independently, rather than in a coordinated fashion. Through the MovingAhead BRT project, LTD and the City of Eugene are incorporating numerous lessons learned from their past experiences with planning and implementing BRT projects. To implement these newer, agency-coordinated approaches to planning and implementing multimodal projects, agencies need to be motivated and identify the value in a coordinated approach. The approaches the agencies are undertaking for the MovingAhead BRT project are providing numerous benefits, including that the project is aligned with regional goals; there is better, more effective outreach to key stakeholders and the public; the level of effort overall is reduced, but only after elevated up-front efforts; and the agencies can leverage numerous funding sources to implement projects.

As the implementing partners had also learned that having the City be a key lead in transit project implementation is beneficial, it was determined that LTD and the City should colead and cobrand the MovingAhead BRT project. There was a change in branding to demonstrate this unity, strategically showing that the City of Eugene and LTD joined together to implement this project. The MovingAhead BRT project logo and brand displays this partnership: this is a clearing house for transit/bike/pedestrian solutions for the entire community, not just one agency. It was noted that LTD has changed from implementer of the BRT system to a collaborative partner in making multimodal improvements on major corridors; however, in terms of NEPA and FTA expectations, the LTD takes ownership in that piece of the project. This change in the role was a cultural shift at the staff and board level, from implementer to collaborative process. This change seemed natural as it evolved over time, however, there was an element in the past of LTD wanting full control over the route placement, the operation and logistics of it – now the transit options are more flexible and the plan is about what the route means for the community. There are a variety of service levels/treatment types to fit within a corridor, not just a one-size-fits-all BRT solution, this perspective was not in place at the time of the Green Line/West Eugene extension.

Another lesson learned was that transit projects need to be coordinated and supportive of larger regional planning efforts and coordinated with future land use. This lesson was addressed in the MovingAhead BRT project, as the project emphasizes the coordination of transit and future land use assumptions, providing mobility to corridors with greatest growth in population and employment. Another purpose of the project is to make clear how transit projects support regional economic, quality of life, and mobility goals, building from and implementing the local plans, Envision Eugene and LTD's Long Range Transit Plan.

The agencies also found that outreach to local businesses must be direct and targeted. Multimodal construction projects are much more beneficial for businesses and property owners if agencies collaborate and only disrupt businesses along the corridor once instead of multiple times for individual modes, especially if the project timelines are tight. An unexpected benefit of the MovingAhead Bus Rapid Transit

project was that there were cross benefits from the transit project experience, allowing them to help with outreach for other city projects. Some consultant teams are working on other local projects, such as road diets and the construction and city crews/inspectors used similar tactics from previous projects.

LTD and the City of Eugene, viewed the multimodal approach as a logical evolution in planning, finding that it makes sense to consider the needs of a corridor, not just the specific transit service features of the corridor. If improvements are to be considered for one mode it makes sense to consider improvements for other modes, especially those that connect people to transit. LTD and Eugene asked – ‘if we’re going to do this transit project, what will make the whole project better on a regionwide network?’ To jointly plan for system needs holistically, considering all modes, LTD and the City utilize a Portfolio Management concept.



Please see the end of this case study for a description of this evolving approach to holistic corridor planning.

Another motivation for coordination is the Vision Zero goal for improving safety until there are no longer any fatalities on the transportation system. Larger BRT planning projects tend to be along higher classification streets (with higher volumes and speed), which have more fatal and severe injuries. Looking at transit planning, how buses operate overall, and ways to improve the community safes lives, reduce injuries, and is a more robust effort.

For the Moving Ahead BRT project, the coordination process was formalized. There are multiple [Intergovernmental Agreements](#): LTD/Springfield, LTD/Eugene, LTD/Other Planning Partners. The process has also been informed by the public outreach and Governance Team. The City Council input has evolved over time in some ways that were documented in project planning, but has not formally changed with IGA amendments. The LTD also has a charter process, the [Sounding Board Charter](#), with the City of Eugene since collaboration at this scale has not been undertaken before.



The following table summarizes coordination processes and tools for the MovingAhead BRT project.

Table 1. Summary of Multi-Agency Coordination.

Process and Tools	Outcomes
Held a wide variety of internal meetings, including in-person, conference calls, and group workshops.	<ul style="list-style-type: none"> Ensured participants were included every step of the way, going from purely coordinating efforts to collaborating towards a solution.

Process and Tools	Outcomes
Held a series of committees, commissions, and meetings with members ranging from local staff, public officials, residents, and business owners.	<ul style="list-style-type: none"> • Provided a wide variety of viewpoints and ideas to the project team. • Supported public outreach.
Created a MovingAhead Bus Rapid Transit project brand highlighting the joint partnership of LTD and City of Eugene.	<ul style="list-style-type: none"> • Displayed the project supported a regional vision and was not the responsibility of only one agency.
Prepared to change expectations and adapt to situations.	<ul style="list-style-type: none"> • Reduced delays due to unexpected issues. • Supported the vision of a true collaborative process by being open to ideas and hearing alternative solutions.
Used an approach that had previously worked in other local agencies and departments.	<ul style="list-style-type: none"> • Understood the process, perspective, and needs of other partners.
Acknowledged the current political climate and adjoining projects underway or under consideration.	<ul style="list-style-type: none"> • Allowed the project to take appropriate actions to counteract negative effects.
Created a foundation for future projects, programs, and initiatives.	<ul style="list-style-type: none"> • Represented good governance where agencies are stronger together, working towards a solution that satisfies the community's needs and wants. • Supported more holistic solutions that improve safety. • Provided the opportunity for LTD and City of Eugene to review project scopes and suggest enhancements. • Created a Portfolio Management approach, detailing how bicycle/pedestrian projects and operational improvements fit within an identified transit corridor.
Created multiple Intergovernmental Agreements.	<ul style="list-style-type: none"> • Outlined the responsibility of each partner.
Established a protocol for file-sharing and handling documents.	<ul style="list-style-type: none"> • Created one place to share files. • Ensured the latest documents are being used. • Simplified the reviewing and editing process.

Role of the State DOT to Assist in the Delivery of Multimodal Transportation Solutions

Research into this case study has revealed several ways in which the State Department of Transportation can assist in the delivery of multimodal transportation solutions. For the MovingAhead Bus Rapid Transit project, lessons regarding the role for the State DOT actions include the following:

- State DOT was an intermodal champion – ODOT has supported more transit-supportive engineering, design, and operations, including allowing BRT to operate on its own right-of-way.
- ODOT was active in the project and a representative is available to talk on day to day basis.
- State DOTs should provide multimodal project funding. ODOT provided \$2 million for multiyear tiered NEPA process for Green Line and provided funding for Moving Ahead Bus Rapid Transit project through a state grant.

Lessons Learned - Participant Perspectives

This case study has provided numerous lessons that can be transferred to other multimodal projects including the following:

- Visualization is an important tool.
- Prioritizing face to face outreach early on is resource intensive upfront but it is very important for project success and effective use of funds. Planners must know who is on the corridor, understand the issues, and take in their feedback. Also having board members ready to speak to individuals, be able to tell the story, and convey the message is important as well.
- Be aware of how larger political discussions at national, state, and local level can impact the perception of the project. At the local level, there was push back against the LTD board being appointed rather than elected. Also, projects outside of LTD's control impacted EmX. The West Eugene Parkways was not built and some business owners and the neighborhood wanted the roadway built instead of the Western EmX BRT. The team saw certain groups/organizations opposing the transit line because they were unhappy that the parkway was not built.
- Regional planning and outreach to the public is needed to link the benefits of transit projects to overall regional goals. Partner with the local jurisdiction(s) to ensure transit supports local/regional growth and economic development goals and preferred growth patterns.
- Early outreach is vital to gather concerns and input on the project from local businesses and community members. Some caution is needed with discussions regarding land use with small businesses. It is important to have conversations about how to grow, how transit investments impacts growth and how to spread benefits and mitigate any negative impacts of growth and change.
- The team recognized the difference between coordination and collaboration. Coordination is keeping the team up to date and involved in conversations. But collaboration involves organizations from ground up, with everyone involved every step of the way and planning and implementing together. Collaboration can be more work up front but can illuminate where you want to go through the process more quickly. Coordination and collaboration can be daunting but can ultimately achieve things faster.
- Agencies need to be prepared to adapt and accept any one person does not always have the right answers. Coordinating NEPA or engineering aspects can be challenging at times but it is important for planners to be ready to adapt and know that they alone do not have all the right answers.
- Flexibility – allowing some wins and losses through collaboration is critical to moving forward.
- Implementing multimodal projects is far better in the collaborative process; it is not always a win-win situation, so both agencies need flexibility to be successful.
- Seek out those that have implemented similar projects as mentors.
- Avoid planning and developing each transit corridor separately. This prevents the opportunity to think big, consider the big picture, and measure the systemwide benefits. Siloed planning also does not sufficiently engage the public stakeholders which can lead to project opposition at the time of implementation.
- A project will experience turnover in staff and elected officials. Database management tools can be helpful and carry other institutional knowledge.

Key Concept: Portfolio Management Approach

The Project Management Institute (PMI) defines a portfolio as: “a collection of projects and/or programs and other work that are grouped together to facilitate the effective management of that work to meet strategic business objectives. The components (projects or programs) of a portfolio are quantifiable; that is, they can be measured, ranked, and prioritized.” In that context, the PMI goes on to define “portfolio management” as: “the centralized management of one or more portfolios, which includes identifying, prioritizing, authorizing, managing, and controlling projects, programs, and other related work, to achieve specific strategic business objectives.”



This approach to managing projects has been applied by Tom Schwetz at Lane County Transit District (LTD) to transit projects as it aligns well with the process implementing partners undertake for project development. This is a tiered approach to decision-making. The virtues of this approach are twofold. First, primarily from an internal standpoint, portfolios enable participants in planning and implementation to look more broadly at needs from a systems perspective. Rather than ‘siloeing’ efforts to a single corridor, planners can take a systems development approach which enables them to consider the longer-term requirements (staffing, funding, and policy) of strategic objectives (for the City of Eugene and LTD, this includes areas such as building the regional BRT system, Eugene’s bike system, or Eugene’s compact corridor development approach). Second, from a partnering standpoint, partners can overlay their respective portfolios (similar to a Venn diagram) and get a clearer picture of where and how they need to work together. For the MovingAhead project this overlay would indicate that the planning phase is clearly a shared responsibility.

Using this approach, partners start to understand the importance and specific nature of the collaboration. For example, in order for LTD to realize the development of its portfolio (in this case, development of the regional BRT system), LTD has to understand and incorporate the needs of the other transportation modes in the corridor – not just at the point where transit connects, but at the system level. In a similar fashion, the transit agency needs to understand and establish a more robust relationship with the process in planning for growth and development along the corridor. In that same vein, the City needs to have a similarly robust understanding of the transit system needs in the corridor. While it might go without saying, robust community engagement needs to be integrated into all phases of our work. “Beyond the immediate benefits of developing a portfolio perspective,” says Schwetz, “is the ability to understand and articulate more rigorously where we are going and what it is going to take to get there puts us in a position to more effectively seek funding and garner the support we need to deliver the vision.”

Project Website: More information on this project can be accessed on the Moving Ahead Bus Rapid Transit project website: <http://www.movingahead.org/>.

Case Study: Maryland Transit Administration and Baltimore City | BaltimoreLink

NCHRP selected this case study because of the numerous and effective coordination approaches used by the MDOT-MTA and partner agencies. The project exemplifies a strong State DOT role, coordination required within a large city to undertake a large and far-reaching project. This project also encountered challenges that might be addressed by revisions to Federal guidance. The case study project includes the following transportation modes:



Project Leads and Key Stakeholders

The Maryland Department of Transportation – Maryland Transit Administration (MDOT-MTA) is the transit operator within the State of Maryland and is a Transportation Business Unit of the Maryland Department of Transportation (MDOT).

The administration oversees a wide variety of transit services, operating local and commuter buses, light rail, metro subway, commuter trains, and paratransit services. The MDOT-MTA Office of Planning and Programming led the

BaltimoreLink was a multifaceted project, significant and effective coordination was necessary to plan and implement a successful project.

Planning and Implementation of BaltimoreLink, with support from the MDOT Secretary's Office (TSO), Office of Planning and Capital Programming (OPCP), and Office of Real Estate, the Baltimore City Department of Transportation and Department of Planning, the Maryland Department of Planning and transit advocates. There was strong support for this project at various levels, including Governor Hogan, Transportation Secretary Pete Rahn, and MDOT-MTA Director of Planning and Programming, Kevin Quinn (Acting Administrator of the MDOT-MTA as of summer 2017).

- **Office of Planning and Programming, Maryland Transit Administration (MDOT-MTA)** – As the transit operator, MDOT-MTA was responsible for the project definition, which include improvements to service, infrastructure, and operations. In addition to transit improvements, the project was to include implementing bike share at transit stations and add bike parking at transit stations.
- **The Secretary's Office (TSO), Office of Planning and Capital Programming (OPCP) Maryland Department of Transportation** – Provided financing, helped to coordinate a successful TIGER Grant application (North Avenue Project) (\$27 million) which helped to improve the relationship between Baltimore City and MTA/MDOT, and participated in biweekly meetings. The Secretary's Office also was engaged when there were issues coordinating between entities.
- **Baltimore City Department of Transportation** – Participated in planning activities, helped to scope



of work and select the project consultant team, coordinated to implement bus lanes and other improvements in the City right-of-way to improve access for multimodal transportation, and identified other opportunities for collaboration, such as conversion of a City parking lot to a MODT-MTA bus loop.

- Maryland Department of Planning – Provided coordination early on.
- **Transit Advocates** – Supported project and helped improve routing and communicate to a broader audience about the planned changes.

Project Summary

The BaltimoreLink project addressed three overall improvements: service, infrastructure, and outreach. The change in service enhanced the current transit network by strengthening connections and mobility. To support the reliability and accessibility of this new service, MDOT-MTA and the City of Baltimore installed various infrastructure improvements, including dedicated bus lanes, transit signal priority, transfer facilities, wayfinding signs and maps, and last mile connections through bike share, car share, and local transit operators. The outreach component included gathering feedback to draft plans, and also included working closely with the community to communicate about change in service, helping riders navigate the system, and gathering community feedback. BaltimoreLink launched in June, 2017. The agencies involved in planning and implementing BaltimoreLink have identified key lessons learned that can be applied to coordination of future transit projects. The lessons included that agencies should develop a realistic timeline, encourage as much coordination as possible at all staff levels, especially in-person meetings; take chances and do not hesitate to change the norm; break down barriers of miscommunication; seek to understand the perspectives of partner agencies and transit users; and be flexible.



Coordination of MDOT-MTA and the City also led to other positive outcomes for cost efficiency, project quality, and project schedule. For example, when designing and purchasing new signs, rather than the City and transit agency producing and installing separate signs, the City language for the signs “Tow-Away Zone” was added to the bus-only lane signs. Coordination allowed for better siting of transfer locations, and an accelerated permitting process. MDOT-MTA also conducted several large, day-long workshops for all agencies involved in the BaltimoreLink project. The workshops’ purpose was to bring all working groups and organizations ‘up to speed’, presenting the progress of subprojects and plans. The workshops provided a chance to ensure everyone had access to all planning and construction updates, so that each focus group or agency can ensure all plans and project components align. The agency employed strategies to ensure workshops are interactive and to guarantee each group can gather ideas from all partners to align and improve the Plan. These workshops were modeled after a strategic planning workshop, to break down silos, bring everyone up to the same level of knowledge.

Challenges

- Legal proceedings for the transfer and use of funds can be a significant obstacle. For BaltimoreLink, transferring funds required a legal memorandum of understanding (MOU). These types of proceedings can slow down project advancement; when possible, avoiding funding scenarios that require legal proceedings.

- TIGER funding had been held up as there have been challenges in coordinating compliance with both FTA and FHWA. It would be beneficial if the U.S. DOT would identify, for each project, which Administration's guidance should be followed.
- There was a need to build up relationships amongst the City and agency staff.
- The project had a self-imposed timeline that was very short, and there were many aspects to the project, significant and effective coordination was necessary to plan and implement a successful project. Unlike past projects and initiatives that had been conducted, this project included the consideration of service, routes, and transit-supportive infrastructure.
- MDOT-MTA was committed to achieving high level goals which included, improving reliability, and reduce bus congestion downtown. Providing access to jobs was a secondary goal (new employment and housing centers).
- There was a need to create better regional connectivity and regional connections that do not currently exists were also part of the overarching goals (new express bus routes to White Marsh, Towson/Lutherville/Hunt Valley, Owings Mills, Social Security, BWI, Port/industrial areas in East Baltimore).
- The public had to be heavily involved in the planning process to ensure the new network met the needs of the community, and significant outreach was required for implementation to ensure all system users understood the changes to the system.



Coordination Processes and Tools

Coordination was necessary at every level of the agencies to ensure a successful project – coordination occurred at the executive, management and technical levels.

The scale of the project was grander than many other projects, which raised the importance of the project to Executive levels. Having the MDOT Secretary as a project champion was integral to project successes, and when there were politically sensitive issues the MDOT Secretary would brief the Governor, who considered the project an important initiative.

The MDOT-MTA team was led by the Director of the Office of Planning and Programming, Kevin Quinn (Project Manager, and Acting Administrator of the MDOT-MTA as of summer 2017). The team met every two weeks (in person) with a group consisting of MDOT TSO and MDOT-MTA leadership. The group included the Secretary of Transportation, the MDOT Office of Planning and Capital Programming, the MDOT Office of Public Affairs, the MDOT Office of Real Estate, the MDOT-MTA Administrator, and the MDOT-MTA Chief Operating Office. Director Quinn would provide an update to this group, and the group would discuss key issues and concerns in these biweekly meetings. For example, the timing for the roll out of the new BaltimoreLink was anticipated to occur at the same time as a fare increase – this was considered bad timing when it comes to presenting the new plan to the public and developing a positive public image of the new plan. The leadership group was able to put forth the idea of providing for two weeks of free transit. As this idea would have revenue impacts (approximately \$2.7 million dollars) it was necessary for leadership, especially the Secretary, to understand, support, and approve this decision. These frequent in-person meetings allow for such conversations and timely solutions.

The team created a detailed and formal organizational chart for management and technical aspects of the project, outlining agency and individual’s responsibilities. MDOT-MTA also conducted several large, day-long workshops for all agencies involved in the BaltimoreLink project. The workshops’ purpose was to bring all working groups and organizations ‘up to speed’, presenting the progress of subprojects and plans. The workshops provided a chance to ensure everyone had access to all planning and construction updates, so that each focus group or agency can ensure all plans and project components align. The agency employed strategies to ensure workshops are interactive and to guarantee each group can gather ideas from all partners to align and improve the Plan. These workshops were modeled after a strategic planning workshop, to break down silos, bring everyone up to the same level of knowledge. MDOT-MTA also met with Baltimore City officials on technical issues separately.



In addition to the workshop, there was stronger coordination between Baltimore City and MDOT-MTA on bicycle improvements. Shared bus and bike lanes are also included in the project, and the new dedicated bus lanes are allowed for use by bikes as well, and bicycle parking and bike were also prioritized due to this project. Bicycle parking investments were originally going to be outside of Baltimore City but project moved investments to be at transit stations inside Baltimore City as well since there was the theory that MDOT-MTA will get more bicycle share riders if they are places close to transit stations/stops. Prior to the project bicycle facilities would be installed in locations based on citizens request rather than based on strategic siting where they would be most used. Baltimore City DOT also has funding for bike share membership discounts for lower income individuals.

Table 2 encapsulates critical aspects of coordination cited by the agencies involved that led to successful, well-coordinated multimodal project outcomes.

Table 2. Summary of Multi-Agency Coordination

Process and Tools	Outcomes
Organized weekly/biweekly meetings with internal stakeholders.	<ul style="list-style-type: none"> Established trust between MDOT-MTA and City of Baltimore. Created opportunity to address smaller, though important, projects that helped BaltimoreLink’s success (e.g., replaced a parking lot with a bus loop).
Hosted three internal workshops.	<ul style="list-style-type: none"> Helped establish relationship between Baltimore City, MDOT-MTA, and MDOT planners. Provided update on BaltimoreLink project while providing opportunity to talk openly about issues. Served to remove/bypass “silos” within organizations.
Used the past experience that employees had working in BaltimoreLink partner agencies.	<ul style="list-style-type: none"> Brought industry background on specific agencies. Built off of existing personal relationships and agency familiarity.

Process and Tools	Outcomes
Supported by political project champion.	<ul style="list-style-type: none"> • Briefed other political officials on progress. • Gathered information on politically sensitive issues.
Coordinated the selection of consultant among partners (i.e., MDOT-MTA and Baltimore City). Coordinated permitting for capital improvements.	<ul style="list-style-type: none"> • Ensured all parties would be comfortable and familiar with the consultant. • Built on previous relationship between MDOT-MTA and the City of Baltimore. • Offered solution in response to MDOT-MTA not owning any property in Baltimore City. • Supported goal of service and infrastructure improvements.
Used memorandum of understanding (MOU) as a formal agreement between MDOT- MTA and Baltimore City.	<ul style="list-style-type: none"> • Recommended creating individual MOUs for each project aspect (transit signal priority, bicycle lanes, bike share, etc.) to save time and make process easier.
Set up a file sharing system.	<ul style="list-style-type: none"> • Used platform to organize public comments. • Allowed easier file sharing between partners.

Role of the State DOT to Assist in the Delivery of Multimodal Transportation Solutions

Research into this case study has revealed several ways in which the State Department of Transportation can assist in the delivery of multimodal transportation solutions. For the BaltimoreLink project, lessons regarding the role for the State DOT actions include the following:

- For BaltimoreLink, the Secretary’s Office acted as a key coordination partner, and was active in addressing issues and solving overarching challenges.
- MDOT coordinated a successful TIGER grant application, (North Avenue Rising – \$27 million) with Baltimore City, which strengthened the relationship between the parties and provided project funding for a key transportation corridor.

Lessons Learned - Participant Perspectives

- Projects cannot have enough coordination, both at the staff level and at the Manager and Executive level, and should be face to face as much as possible.
- Take time before the project to develop a realistic timeline (including requirements for a public hearing, construction schedule, permitting schedule, etc.). The self-imposed timeline of two years to plan and implement the BaltimoreLink project was not very realistic, and was quite challenging.
- Remember to ask why things are done the way they are and do not be afraid to change them.
- Try to break down any barriers of miscommunication inside organizations to ensure that you keep moving the conversation forward.
- Be flexible and prioritize projects/investments.

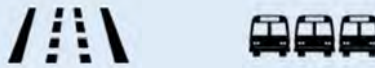
- Remember that people have built their lives around the current bus system has any change could have a major impact on people getting to work or the doctor and it is important to have a strong public outreach program.
- Allow for as much time on the project as possible.
- Establish multiple MOUs, not one for the complete project. MDOT-MTA indicates that instead of having one overarching MOU between MDOT-MTA and Baltimore City for all projects, it would have saved time and smoothed the process to have multiple MOUs for each individual project (TSP, bike lanes, bike share, etc.). Having an overarching MOU means that if something changes in one project then it holds up the MOUs for all projects.
- Have a legal coordination team in parallel to the project to build relationships and enable to make adjustments to legal documents in a shorter amount of time.
- Ensure you have a file sharing system that can be accessed by all partners (state, city, consultants) (Baltimore Link project used PMCS).



Project Website: More information on this project can be accessed on the BaltimoreLink project website: <https://mta.maryland.gov/baltimorelink>.

Case Study: Washington State DOT | I-5 Transit Bypass Project

This case study demonstrates collaborative nature of this project to effectively address increasing levels of congestion in a cost effective manner, on Interstate 5 (I-5) between Seattle and the city of Everett, which lies approximately 25 miles to the north. The I-5 Transit Bypass Project (Bus on Shoulder) is a forthcoming project (not yet implemented as of summer 2017) example that exemplifies the Practical Solutions approach described at the end of this case study. The case study project includes the following transportation modes:



Project Leads and Key Stakeholders

Washington State Department of Transportation (WSDOT) and Community Transit initiated a multiagency assessment to develop a near term (one to four year) action plan to improve transit performance in the corridor. A one day workshop was held in March 2015 to jump start this effort. At the workshop, a small group of agency experts brainstormed and assessed options and developed a list of feasible improvements. A work team comprised of key staff from Community Transit, WSDOT, First Transit and Spokane Transit developed a list of potential transit bypass locations and other possible actions at the workshop. They then began to engage other agencies (such as Puget Sound Regional Council) to form an informal coalition to pursue improvements. Since then, WSDOT and Community Transit developed a proposal to test the use of freeway shoulders as transit bypass lanes during heavy traffic congestion on southbound I-5.

The project is designed to directly address the increasing travel demand between Everett and Seattle and alleviate the resulting highway congestion, improve travel time, and improve transit reliability.

Primary Agencies

- **Washington Department of Transportation (WSDOT)** – Owns and operates I-5, and served as a primary partner.
- **Community Transit** – Public transit authority, and operator of local bus, paratransit, vanpool, and commuter bus services. Served as a primary partner.
- **Spokane Transit** – Attended the brainstorm workshop, although they do not operate buses in the Seattle region (Spokane is located in eastern Washington).
- **Puget Sound Regional Council** – Served in a supporting role. Their goal was to facilitate the conversation to move the project along when needed. Developed reports of conditions in the I-5 corridor that helped demonstrate the need to find solutions.
- **Sound Transit** – Regional transit authority that operates light rail, commuter rail, and express bus services. Sound Transit 3 (ST3), a ballot measure to approve funding for Sound transit service



expansion, was approved by voters in 2016. ST3 added funding for this projects; Sound Transit recognized the value and identified the project as one deserving of financial support.

- **Washington State Patrol** –Supportive and accommodating of this effort. They operate on the shoulders of the Interstate, which now need to be shared with transit, so it was critical to have them on board as a willing partner. WSDOT took the lead on working with them.
- **FHWA and FTA** – Have been a key partner in supporting this project. The project is the first of its kind operating in the region.

Project Summary

The Interstate 5 (I-5) Transit Bypass (Bus on Shoulders) Project was conceived as a means to address increasing levels of congestion on I-5 between Seattle and the City of Everett, which lies approximately 25 miles to the north. Economic and residential growth have significantly increased demand in the travel corridor exacerbating peak hour congestion and decreasing reliability. In recent years, High Occupancy Vehicle (HOV) travel times have increased by almost 20 minutes, and the HOV lanes in the corridor are performing substantially below travel speed standards. As a result transit reliability has diminished with more than 25 percent of bus trips arriving late. Buses and park-and-ride facilities remain overcrowded, with a significant number of people standing for trips of 65 minutes or more. These conditions highlight the fact no one agency has historically been responsible to address the central issues – and the level of financial resources needed to apply a larger, comprehensive solution are unavailable.

To address these issues, WSDOT and Community Transit initiated a multiagency assessment to develop a near-term (one to four year) action plan to improve transit performance in the corridor. A one day workshop was held in March 2015 to jump start this effort. At the workshop, a small group of agency experts brainstormed and assessed options and developed a list of feasible improvements. A work team comprised of key staff from Community Transit, WSDOT, First Transit and Spokane Transit developed a list of potential transit bypass locations and other possible actions at the workshop. They then began to engage other agencies and form an informal coalition to pursue improvements. Since then, WSDOT and Community Transit developed a proposal to test the use of freeway shoulders as transit bypass lanes during heavy traffic congestion on southbound I-5.

The effort resulted in a plan to implement the solution. Through additional study, the group discovered that some drainage basins along the shoulders need to be reinforced to handle the additional load of buses. The agencies set out to secure additional funding to reinforce the basins and advertise to support constructability.

Community Transit was the lead agency for the project and WSDOT was a primary partner, not only in provision of funding but also in leading concept development and coordination. Additional agencies with significant involvement include Puget Sound Regional Council (PSRC), Sound Transit, FHWA, FTA, Washington State Patrol, and Spokane Transit (provided independent, outside of the region input) The PSRC offered tools, facilitation, and planning resources to move the project forward and facilitated conversation between agencies, provided data analysis of travel on the corridor, and briefed the board.

Challenges

The need for this project arose quickly, based on the rebound after the recession, and rapidly growing travel demand pressures between Everett and Seattle. The typical project development time to scope a project solution for State Transportation Improvement Transportation (STIP) inclusion was reduced – and an increasing number of articles and media stories focused on the need to alleviate highway congestion, improve travel time, and improve transit reliability.

State legislative members also voiced concerns regarding the worsening congestion and unreliable travel conditions but stopped short of a large, comprehensive financial solution. This increased scrutiny to develop an effective, targeted, and operationally efficient low-cost solution. This also became the backdrop and primary challenge prompting a workshop to identify such potential solutions between agency partners. The full day workshop acted as an intensive brainstorm session ultimately pointing to transit bypass or bus on shoulders as a viable option.

Coordination Processes and Tools

As noted, the region's transit predictability has suffered with significant day-to-day in the corridor. Community Transit was looking to the state to help them address this problem and build upon a historically strong relationship of coordination and problem solving.

The agencies took an agile approach to develop and deliver improvements. They started by convening a small group of agency experts to consider and assess options and develop a sequential list of feasible improvements. From there, they engaged other agencies and local jurisdictions as needed, to improve the list and form an informal coalition to pursue improvements. Once the project had direction, the coordination effort evolved into a series of action-oriented meetings. The agencies utilized phone calls and face to face meetings to conduct much of the needed coordination, with a high level of targeted research and leg work in between. In March 2015, the primary partners convened a small group of staff experts to brainstorm potential solutions. The intensive approach listed all potential ideas, then vetted them through a technical, policy, constructability and cost effectiveness lens. The focus remained on assessing low-cost, easy to implement solutions which could make incremental, but measurable improvements to report over time. "Shoulder running" was one of five ideas developed.

The group was knowledgeable about all the issues in this corridor and with the primary agencies. The participants were strategically selected based on their technical expertise and experience. Participants were also selected based on their past ability to work well together, openness to new ideas and focus on finding viable, practical solutions which the partners could deliver in a short timeframe. As the transit bypass or bus on shoulder solution was refined. Different agencies took the lead at different times, depending on the agency's strengths and area of responsibility to further refine and describe the deployment and benefits of the transit bypass or bus on shoulder solution.

The agencies formalized operating rules for use of the shoulders. The primary agencies formally involved were FHWA, Community Transit, and WSDOT. Additional agreements will be developed at later stages.

Operation of the transit bypass will begin once reinforcements are completed to the drainage basins along the shoulders. The participants believe the project outcomes may include more public support for transit priority projects, a shift from driving personal vehicles to taking transit, and improved perception of agencies to deliver short term solutions with low cost approaches. Improving the transit experience on this corridor would increase rider satisfaction, support increased transit ridership, help improve roadway efficiency and person throughput and reduce transit operating and capital costs.

Additionally transit bypass will also address rapidly increasing transit operating costs. Community Transit has needed to add time into the transit schedules to achieve some measure of reliability, and at some point, they need to put additional buses into service. They have also added layover time with buses and



drivers staying in one location to adhere to the schedule. This effort will shorten trips by removing layover time, and the improved reliability helps operating costs of both Community Transit and Sound Transit.

Generally, the operating agencies have done a great job of coordinating among operators, and the planning agencies have done a great job coordinating among planners. This project is an operational hybrid – somewhere in the middle, and it is new ground for the agencies. This poses some challenges, because the agencies are not set up organizationally to do this type of project. They are set up for day-to-day operational responsibilities, or for large projects, but nothing in between. As a result, this has been a high-labor effort internally, which is happening while they are already overextended from a staffing standpoint. Table 3 below highlights additional coordination approaches and tools.

Table 3. Summary of Multi-Agency Coordination

Process and Tools	Outcomes
Used a one-day intensive brainstorm approach to identify impactful and cost-effective solutions.	<ul style="list-style-type: none"> • Focused on logical, low-cost, and practical solutions that would incrementally improve performance on the corridor.
Selected participants across agencies who could work together to achieve success, considering the technical expertise and knowledge that would be needed.	<ul style="list-style-type: none"> • Improved project planning and implementation resulted from having a group that was willing to work together, open to flexible approaches, and able to focus on producing a deliverable.
Demonstrated a willingness to pool resources, commit to a joint solution, and communicate regularly.	<ul style="list-style-type: none"> • Enabled addressing of project challenges with appropriate expertise, a mixture of day-to-day operations and long-range planning – the project was not in the wheelhouse of a single resource.
Implemented proactive and continual coordination and communication approaches.	<ul style="list-style-type: none"> • Embraced regular phone calls and face-to-face meetings to maintain communication and coordination. • Created a sense of shared ownership for the project, allowing team work and trust across agencies. • Allowed agency leadership for project elements to be assigned based on expertise or areas of responsibility. • Developed working groups when needed to address issues.
Utilized data to tell a story about corridor conditions and emphasize project need.	<ul style="list-style-type: none"> • Removed data silos to enable analytics and tell the story. • Used multiple travel data sources from the corridor. • Demonstrated project effectiveness via actual data instead of forecasts, e.g., increased frequency of “worst” days in the corridor. • Developed plan to measure and monitor the project results.
Created operating rules and agreements with multiple agencies as needed.	<ul style="list-style-type: none"> • Produced formal operating rules for shoulder of the roadway use, developed by FHWA, WSDOT, and Community Transit. • Generated other agreements that were informal and evolved as needed.

Role of the State DOT to Assist in the Delivery of Multimodal Transportation Solutions

Research into this case study has revealed several ways in which the State Department of Transportation can assist in the delivery of multimodal transportation solutions. For the I-5 Transit Bypass (Bus on Shoulder) Project, lessons regarding the role for the State DOT actions include the following:

- Initiated a multiagency assessment to improve transit performance in the corridor.
- Coordinated with transit agency to initiate effort through a workshop.
- Encouraged and supported unorthodox approaches.

The strategic selection of participants from across agencies who can work together to achieve success is critical.

Lessons Learned - Participant Perspectives

- The agencies involved recommend the use of an agile approach to identify and deliver improvements to existing problems.
- The strategic selection of participants from across agencies who can work together to achieve success is critical. Carefully consider the technical expertise and knowledge that is needed. Recruit people that are willing to work together, are open to flexible approaches, and who share a willingness to forge new ground and work through problems and issues to reach implementation.
- The lead staff from the agencies involved in this project are solution-oriented and willing to try new things. This is a result of the up-front focus on involving the right staff from the right agencies in brainstorming and then developing the project.
- There is a high level of shared ownership among agencies with this project. This has helped when progress got bogged down at various points. The participants are willing to work together, and they trust the intentions of the other agencies. As a result, they are not getting stuck when the inevitable squabbles arise that can happen with projects. Collaboration has continued even when things became difficult.
- The involvement of a supportive MPO that offers tools, facilitation, and planning resources to move the project forward is important.
- Utilize data to tell a story about corridor conditions and emphasize project need and to form a basis for measuring successful outcomes.
- Implement proactive and continual coordination and communication approaches, including reliance on face to face meetings and leg work.

Key Concept: Practical Solutions

Practical Solutions is best described as a collection of programs to advance performance-based (versus standards based) transportation solutions. Robust internal collaboration and a two-tier, decision-making structure is changing how staff across various divisions and program areas approach problem solving at Washington State Department of Transportation (WSDOT) and share in resource and cost-efficient improvements.

WSDOT's move to this approach is augmented by recent Washington State legislation and the Secretary's Executive Order (E1090.00) which enables and encourages a more holistic, cross modal, and cross disciplinary approach to strengthen community engagement and agency credibility. WSDOT's Secretary cites Practical Solutions as a key agency focus area – often referring to its early results as a way to promote and advocate change. Practical Solutions is not led by one particular division or department but advanced through initiatives and internal consensus to:

- Move to a performance-based approach to solving transportation needs;
- Use data, new tools and best practices to preserve and maintain existing assets so that they last longer;
- Use more comprehensive tools and performance measures to support decision-making, rather than using limited data such as the volume of current traffic or safety history;
- Establish a multidisciplinary, multijurisdictional, multiagency approach to decision-making that considers more than just highways but looks at the entire transportation system of local roads and streets, arterials, transit, bike and pedestrian facilities, rail, air and marine;
- Enhances community engagement efforts to craft least-cost solutions within the context of land use;
- Considers operational and demand management strategies before high-cost capital projects are committed; and
- Implements low-cost solutions sooner, rather than waiting years for a high-cost project to be funded.

A common thread in this is the use of sustainable transportation practices to preserve the environment, promote transportation system efficiency, seek fiscally efficient solutions, improve and protect public health, conserve energy, and reduce greenhouse gases. The effort already has yielded changes to design manuals and technical guidance and prompted a cultural shift that is still evolving. Ongoing training and the role of two internal Practical Solutions groups (Roundtable and Working Group) is reinforcing the level of investment and seriousness of sustaining agency change. Practical Solutions is in an evolving stage of maturity and development and not defined by a single project but rather a systematic approach whose outcomes are yet to be fully realized.

Project Website: More information on this project can be viewed in the WSDOT Public Transportation Plan, page 47, https://www.wsdot.wa.gov/NR/rdonlyres/EF00F16E-472D-43FE-AFF6-935DF809274B/0/WashingtonStatePublicTransportationPlan_Section50871816optimized.pdf.



Case Study: Greater Cleveland (Ohio) Regional Transit Authority (RTA) | Clifton Boulevard

This case study highlights a project for a primary corridor and a project type likely to be repeated across the U.S. The best practices conveyed in this case study can be applied broadly. This case study is representative of a mid-sized urban area. The case study project includes the following transportation modes:



Project Leads and Key Stakeholders

The Greater Cleveland Regional Transportation Authority (RTA) is the public transit agency for Cleveland, OH and surrounding suburbs. RTA owns and operates the RTA Rapid Transit rail system, which consists of one heavy rail and two light rail lines, and extensive bus service and downtown trolley service.

Primary Agencies

- **Greater Cleveland Regional Transportation Authority (RTA)** – Served as the project lead. This was a natural fit due to the type of project and their involvement, relationship to all project partners.
- **The City of Cleveland and City of Lakeland**, through which Clifton Boulevard runs. Staff from both cities were involved in project details.
- **Ohio Department of Transportation (ODOT)** – Own the roadway and partnered in finding flexible, financial solutions.
- **Cleveland State University (CSU)** – Purchased naming rights to the new Bus Rapid Transit (BRT) service. Many CSU students use the service.
- **Northeast Ohio Areawide Coordinating Agency (NOACA)** – The transportation and environmental planning agency serving Cuyahoga, Geauga, Lake, Lorain and Medina counties. NOACA is also the designated MPO for Northeast Ohio. NOACA assembled project funding from several sources.

A key challenge for this project was there was not a single source of funding available to implement the project.

Project Summary

The Clifton Boulevard Transportation Enhancement Project upgraded four miles of the corridor, enhancing access for all transportation modes. Beginning in 2007, the cities of Lakewood and Cleveland worked together to develop a conceptual plan to enhance Clifton Boulevard. The initial concept was to implement traffic calming measures to enhance access to the corridor for all transportation modes and improve the landscaping, lighting and transportation amenities. In 2009, RTA applied for and received federal stimulus funds to design and study the project and evaluate needs. The study investigated how to make the wide streets more easily accommodate transit, alleviate congestion, and address safety issues, especially for bicyclists and pedestrians. The findings resulted in a BRT line along the corridor, with a variety of other retrofits and enhancements such as new branded buses, rebuilt streets and sidewalks, and new bus shelters. The BRT service was named the Cleveland State Line. It opened in December 2014.

The RTA was the lead agency for the project. The City of Cleveland, City of Lakewood, Ohio Department of Transportation, Northeast Ohio Areawide Coordinating Agency (NOACA), and Cleveland State University (CSU) also played significant roles.

Each activity in the coordination process resulted in multiple outcomes to sustain and maintain project momentum. Key lessons were drawn from each step of the process and have broad applicability to similar projects in comparable metropolitan areas. In particular those lessons include having a project champion to skillfully lead the coordination effort; identification of project goals that align with regional goals; development of a funding package from a variety of sources; and ample opportunities for input from multiple, diverse stakeholders. These actions, encapsulated by the lessons learned and described in further detail below, are applicable to practitioners who seek to implement a multimodal success story in their respective context.



Challenges

- The City of Cleveland and Lakewood had differing vision and aspirations for this corridor. Each saw solutions through lenses which best served their respective constituents but both entities also recognized possibilities of revitalized land use and development in the corridor, improved transportation mobility and safety and the incorporation of local stakeholder and citizen ideas in project planning and design. The primary challenge was to bring the cities together to agree upon common goals to serve joint community interests and agree to leverage resources (tools, staff, financial) towards a broader, multimodal solution which could fulfill these goals. The up-front trust building effort took time, but RTA helped facilitate conversation and build a joint process to manage project coordination and development. The partners were also challenged in securing adequate funding to achieve their common goals and comply with a myriad of federal regulatory issues to satisfy FHWA and FTA given a proposed solutions involving both roadway, transit, and bicycle-pedestrian solutions. Such issues typically require a lengthy amount of time to overcome and can consume agency resources and focus for an extended duration. The overall challenges could best be summarized as the following:
 - Due to the corridor-level focus of this project, there was a need to coordinate effectively to address all aspects of the community, including historic and cultural groups, disadvantaged communities, and local businesses.
 - In the past, there was a lack of sufficient coordination early on, coordination needed to be intentional and occur early in the project to be effective.
 - No single source of funding was available to implement the project.

Coordination Processes and Tools

The motivation behind the project came as RTA conducted a high priority analysis of corridors. This corridor had a high propensity for transit, even though it did not meet New Starts criteria. The project addresses existing congestion in the corridor and numerous safety issues, especially for bicyclists and

pedestrians. It includes consolidated bus stops, new stations, a new traffic signal system, and landscaping/beautification. The project aligns with vision and goals established for the greater Cleveland region, and provides enhanced access to additional travel modes, has environmental and economic development benefits, and numerous other benefits. These were key factors driving wide support for the project. The project cost was also relatively low cost, with significant economic development benefits. A similar project in the region, the RTA's HealthLine BRT on Euclid Avenue, helped stimulate more than \$5 billion in economic development, while increasing ridership by more than 60 percent.

As this section of Clifton Boulevard travels through two jurisdictions, there was a significant amount of coordination was necessary to successfully complete the project. While most of the participating entities have worked together previously, some initiatives have stalled because adequate coordination was not in place. This project is unique from a coordination perspective in that multiple government entities were involved, and therefore, a high level of coordination was needed. RTA successfully provided this coordination role. RTA developed agreements with multiple agencies. These outlined the responsibilities of each party to the agreement. RTA generally developed informal memorandums of agreement (MOU), which worked well. Some MOUs were lengthier (up to 40 pages). Over time, the agencies moved to simpler MOUs.

To coordinate, the agencies used a variety of methods, including a Civic Advisory Committee, public meetings, and a project website.

RTA played a strong role, applying skillful coordination, in the collaboration between the City of Cleveland and City of Lakewood. The agencies found that working together on one big project was helpful – the agencies saw the big picture and were motivated to ensure a successful completion. The coordination partners stuck together throughout the process. This was noteworthy given both the lack of historical cooperation and risk of lost momentum due to project roadblocks or challenges.



RTA worked closely with partners to address cultural and technical aspects of the project. For example, Clifton Boulevard runs through a landmark district. It was important to tie the design of bus shelters to the residential architecture along the corridor. Public art was incorporated. RTA worked with city engineers to address street or lane closures and disruptions on a case by case basis and provided updates on project and construction schedules.

To coordinate, the agencies used a variety of methods, including a Civic Advisory Committee, public meetings, and a project website. This website was project specific and was helpful in gathering input, especially in the design phase. It allowed stakeholders to submit questions or comments, and listed contact information for RTA lead staff. The Civic Advisory Committee ensured that the project represented the consensus of the community, thereby reducing the potential for conflicts and delays during implementation.

Many conversations took place at NOACA, in a regional forum. Having the three entities work together and speak with one voice in this regional forum helped with obtaining funding from NOACA. It also demonstrated to other decision-makers that the major entities were coordinating, and helped project components score better in the NOACA process.

Table 4 Summary of Multi-Agency Coordination

Process and Tools	Outcomes
<p>Implemented a proactive project management approach throughout implementation.</p> <p>Used robust public involvement throughout the project, including creating a website, blog, and Civic Advisory Committee and holding meetings with neighborhood groups.</p>	<ul style="list-style-type: none"> • Improved communication about timelines and schedules, including about impacts at the individual street level, to better manage disruptions. • Limited the negative impacts of project construction on public and businesses. • Encouraged stakeholders to submit questions and comments and provided contact information for project leads. • Received a wide variety of viewpoints and ideas during environmental, planning, design, and construction processes. • Obtained agreement on possibly contentious issues, such as bus stops maintaining architectural integrity in the corridor and residential concerns with bus stop placement. • Tailored project to communities by engaging artists to design signage along the corridor. • Reduced conflicts and delays during implementation.
<p>Placed emphasis on the alignment of project goals with vision and goals established for the region.</p> <p>Assembled a creative funding package from multiple sources and agencies.</p> <p>Communicated the status of funding inquiries and responses.</p>	<ul style="list-style-type: none"> • Confirmed project supported transit-oriented commercial and residential growth, enhanced access for all modes, environmental benefits, and reduced congestion. • Helped position project as implementation of existing plans. • Built support to provide funding for the project and increased commitment from agencies. • Provided funding through a combination of programs and sources, including U.S. DOT, Ohio DOT, RTA, NOACA, City of Cleveland, and City of Lakewood. • Supported creative thought around funding. • Encouraged partners to wait collectively for the financial picture to emerge.

Role of the State DOT to Assist in the Delivery of Multimodal Transportation Solutions

Research into this case study has revealed several ways in which the State Department of Transportation can assist in the delivery of multimodal transportation solutions. For the Clifton Boulevard Project, lessons regarding the role for the State DOT actions include the following:

- Helped creatively fund and finance part of the corridor improvement.
- Provided valuable support role addressing questions on use an- Participant Perspectives d requirements of state funds, design standards, and committed to the project early on.



Lessons Learned - Participant Perspectives

- Utilize a robust public involvement process throughout the project. This can include a project website, blog, and meetings with neighborhood groups.

- Utilize an informal agreement process with agencies to ensure flexibility, and adapt as necessary.
- Allow the project team to receive a wide variety of viewpoints and ideas during environmental, planning, design and construction processes, and obtain agreement on possibly contentious issues, such as bus stops maintaining architectural integrity in the corridor and residential concerns with bus stop placement.
- Expect surprises during implementation. These may include an unexpected change in City leadership, a change in funding, longer than expected lane closures, impacts to private property, etc. A skillful and flexible coordination effort coupled with commitment to successful implementation from primary agencies will keep the project moving forward.

Project Website: More information on this project can be accessed on the Clifton Beach Improvement Association website: http://www.cliftonbeach.com/Clifton_Boulevard.php and the Greater Cleveland Regional Transit Authority project webpage: <http://www.riderta.com/majorprojects/cliftonblvd>.

Case Study: New Mexico (Santa Fe) | South Capitol Rail Runner Station

This case study provides perspectives of a smaller city, and the southwestern geographical area. This case study also highlights coordination practices to produce a project that focuses on a specific project element – a transit station. The case study project includes the following transportation modes:



Project Leads and Key Stakeholders

New Mexico Department of Transportation (NMDOT) was in the lead role. There was agreement because NMDOT was paying for the rail service and it was a priority of the governor. At other points, other agencies took the lead on certain tasks. The Mid-Region Council of Governments (MRCOG) took a lead role later in the project with organizing meetings and working with the public. They were able to operate with fewer restrictions than NMDOT staff would have. This allowed the project to be completed on time.

Primary Agencies

- **New Mexico Department of Transportation (NMDOT)** – Owns the rail line and operates park and ride lots.
- **North Central Regional Transit District** – Provides funding. They provide about 5 percent of the Rail Runner funding.
- **Rio Metro Regional Transit District** – Operates the train.
- **City of Santa Fe** – Owns and operate buses.
- **Santa Fe MPO** – Provided planning coordination, convened stakeholders for station evaluation, and provided data and mapping analysis.
- **Santa Fe Trails** – The City of Santa Fe bus system.
- **Mid-Region Council of Governments**, which provided planning and design coordination.
- The Chamber of Commerce and the travel and tourism industry – these parties were supportive of the commuter rail project.

Project Summary

The South Capitol Rail Runner Station is a station in Santa Fe serving New Mexico’s Rail Runner Express commuter rail, which connects the metropolitan areas of Santa Fe and Albuquerque, with the route parallel to Interstate 25 (I-25). The first phase of the Rail Runner system began operation in 2006. The second phase, an extension to Santa Fe, opened in late 2015.

The implementation of commuter rail service in this corridor began in August of 2003 when Governor Bill Richardson announced the State would pursue the implementation of commuter rail. In September 2003, the State Legislature passed a \$1.6 billion transportation improvement package that included implementation of this service. In February 2008 work began on site plans and design work for the South Capitol station.

The South Capitol Rail Runner Station was the first large state-regional-local initiative of its type.

The Station includes a park-and-ride lot along with connections to a variety of bus services by multiple providers, including Santa Fe Trails, Santa Fe Pickup, New Mexico Department of Transportation (NMDOT) Park and Ride, and North Central Regional Transit District (NCRTD). The two-sided platform is a major stop for business commuters and for those wishing to make bus connections to other locations in and around Santa Fe. The State Government complex is in the vicinity of the station; other development, such as the construction of 15 three-story loft-style residences in 2008, has changed foot traffic, land use patterns, and economic vibrancy in the area. The commuter-oriented lofts represent a notable departure from typical density patterns in Santa Fe.



The development of service in this corridor required concurrent and well timed and coordinated efforts on many fronts. In addition to the agencies listed above, Rio Metro Regional Transit District, City of Santa Fe, Santa Fe MPO, and Mid-Region Council of Governments (MRCOG) were directly involved.

The agencies involved in planning and implementing the South Capitol Station have identified key lessons learned that can be applied to coordination for similar projects in other metropolitan areas, particularly small urban areas on the edge of rural locations. In particular those lessons include:

- Having a strong project champion at the highest level of government in the State, and capitalizing on favorable conditions for success;
- Successful coordination across multiple agencies, who all had ownership and interest in the success of the project;
- Ample opportunities for public involvement from citizens and stakeholders, including planning and design input on station locations and connection to trails;
- Holding frequent in-person meetings with key agencies throughout project planning and implementation; and
- The panel interviews included a number of questions to establish the context, discuss the coordination processes, and coordination outcomes for the South Capitol Rail Runner Station Project. This section provides the questions, and a summary of the responses to the questions. Comments are attributed in cases to provide clarity.

Challenges

The partners did not identify any specific coordination challenges in planning and implementation of the project, except for completing the work within the required timeframe. The planning partners had worked together in the past and had established good working relationships and were able to draw from those existing relationships during project development and implementation. Coordination was primarily informal. The entire process was driven by the aggressive Rail Runner project development schedule and high visible champion which prompted expediency and focus on completion.

Coordination Processes and Tools

The fact that this project was a high priority of Governor Richardson motivated the agencies involved to move forward with implementation. In 2003 the Governor provided the New Mexico Department of Transportation (NMDOT) and the Mid Region Council of Governments (MRCOG) with grants of \$1 million to begin the implementation. In September 2003 the New Mexico State Legislature passed

House Bill 15, a \$1.6 billion transportation improvement package. One of the projects in this bill, Section 27, was the implementation of commuter rail between Belen and Santa Fe. Responding to this legislative and executive initiative, MRCOG and NMDOT developed a strategy for implementing commuter rail in this corridor. The project was divided into two phases.

The agencies looked at development of individual stations. An analysis of station location was performed. This led to a focus on making South Capitol a multimodal station due to location and other uses. Walking distance to jobs was important, as well as new or existing bus service. There is a significant amount of employment concentrated in a fairly small area. The station is helping provide an early non-highway capacity solution to expected future congestion on the parallel interstate. There are significant constraints to adding capacity all along this corridor and Interstate 25 is the only continuous road connecting Albuquerque and Santa Fe, and few options exist for expansion.

This was the first large state-regional-local initiative of its type in Santa Fe. Smaller scale multi-agency efforts in other parts of New Mexico – such as a bus service hub in Albuquerque – had been difficult to complete. The level of coordination and up front agreement on the management and direction of the project yielded a more unified process with benefits everyone could see and experience.

Participants had weekly meetings that focused on the rail line but also on stations themselves.

The coordinating agencies held hundreds of in person meetings were held, including many formal public meetings related to the environmental, planning, design and construction process, project updates to the governing boards of the jurisdictions along the line, and meetings with civic, religious and neighborhood associations. Most meetings were in person and occurred as part of the environmental, planning and design process. Different project phases had different structure. For example, one phase involved

building 18 miles of track. One contractor was awarded both parts of this effort, which enhanced coordination during construction. Participants had weekly meetings that focused on the rail line but also on stations themselves. The meetings didn't have a formal chair.

Station evaluation and selection went through the MPO process, allowing input from the public and decision-makers. Things generally went smoothly through the MPO process. There was general agreement on South Capitol as a location, and the Mayor of Santa Fe was a proponent of the project.

The agencies found that working across agencies was a key factor for successful coordination. Everyone gained appreciation for the overall process by listening to and understanding others' perspectives and disciplines. There was a commitment to coordinate park and ride facilities with rail runner service, and to examine and adapt fare structures. Participants did a lot of work to make sure train service and bus service were coordinated. Similarly, coordinating bus and train service schedules required significant a high level of coordination.

The agencies involved in planning and implementing the South Capitol Station have identified key lessons learned that can be applied to coordination for similar projects in other metropolitan areas, particularly small urban areas on the edge of rural locations. In particular those lessons include having a strong project champion, successfully coordinate across multiple agencies, include ample opportunities for public involvement, and holding frequent in-person meetings with key agencies. Table 5 encapsulates critical aspects of coordination cited by the agencies involved that led to successful, well-coordinated multimodal project outcomes.

Table 5. Summary of Multi-Agency Coordination

Process and Tools	Outcomes
Held hundreds of in-person meetings to incorporate stakeholder and public input.	<ul style="list-style-type: none"> • Facilitated coordination of fare structures between Rail Runner and bus service. • Maintained updates to the governing boards of jurisdictions along the line and at meetings of civic, religious, and neighborhood association groups. • Allowed the project team to receive a wide variety of viewpoints and ideas.
Worked with a wide cross-section of agency staff and disciplines in project planning, design, and implementation.	<ul style="list-style-type: none"> • Emphasized project benefits from the beginning, allowing agencies to understand the objectives and work towards completion within the ambitious timeline. • Avoided contentious issues. • Created a “problem-solving” mentality, drawing on cross-agency perspectives to address issues.
Implemented proactive coordination and communication methods to integrate modal services and schedules and Used existing planning processes to move the project forward within established timeframe.	<ul style="list-style-type: none"> • Ensured a high level of coordination during planning and construction with information posted on the Internet, including weekly website updates during construction. • Produced coordinated schedules between existing bus and • Vetted station locations through the MPO process with policy board members actively weighing in on decisions.
Created a strong branding strategy for Rail Runner.	<ul style="list-style-type: none"> • Created a distinctive, visible, and attractive identity for the commuter rail service and station. • Allowed a common reference for involved agencies and acted as a symbol of the success, transformation of the service, and attractiveness of the area.
Developed tools specifically to analyze and visualize project options.	<ul style="list-style-type: none"> • Built a combined travel demand model using Santa Fe and Albuquerque models. • Developed eye-catching maps to convey information to decision.
Used an informal coordination process to leverage past relationships and ensure flexibility.	<ul style="list-style-type: none"> • Allowed MRCOG to act primarily as an agent of NMDOT for various project needs, allowing for an accelerated process. • Contributed to sense that each agency worked primarily to their strengths.

Role of the State DOT to Assist in the Delivery of Multimodal Transportation Solutions

Research into this case study has revealed several ways in which the State Department of Transportation can assist in the delivery of multimodal transportation solutions. For the South Capitol Rail Runner Station, lessons regarding the role for the State DOT actions include the following:

- The DOT responded to the legislative and executive initiative and funding, MRCOG, and NMDOT developed a strategy for implementing commuter rail in this corridor.
- The DOT leveraged a state asset (rail line) to provide an alternative solution within a suitable terrain and to the satisfaction of partners and stakeholders.

Lessons Learned - Participant Perspectives

- Use existing planning processes (i.e., the MPO process) to move the project forward and strengthen support. Participants in these processes are familiar with each other and comfortable discussing issues in a collaborative forum.
- It would have been helpful to address every issue before construction started, but the timeframe did not allow for this. For example, bicycle access across tracks, lighting, access points, and connecting to existing streets. However, the project may have failed if they had taken the time to address every issue. It is better to capitalize on favorable conditions for project success and move forward while there is momentum.
- Emphasize the project's benefits to agencies and jurisdictions from the beginning. This will allow agencies to get and stay on the same page and work to completion. It won't avoid the inevitable contentious issues and disagreements, but the mutual interest and agency commitment to the project the project will help parties overcome them.
- Encourage each agency to work within their strengths/areas of responsibility to contribute at opportune times in the various aspects of project development, and allow different agencies to take the lead at various points in the project.

Project Website: More information on this project can be accessed on the following website: <https://www.riometro.org/stations/south-capitol>.

Case Study: Integrated Corridor Management, Dallas, Texas, U.S.-75

This case study that provides an overview of successful Integrated Corridor Management (ICM). This project effectively crossed boundaries due to roadway ownership, mode, and jurisdiction, treating the entire network as one and have all agencies respond as a team. The case study project includes the following transportation modes:



Project Leads and Key Stakeholders

Dallas Area Rapid Transit (DART) is the transit operator in Dallas, Texas and 12 surrounding cities, providing a wide range of services to over 200,000 passengers per day, including light rail, commuter rail, local bus, and paratransit service. DART first lead the U.S.-75 Integrated Corridor Management (ICM) project, a collaborative and cooperative project for improving service along the U.S.-75 corridor; it is now lead by TXDOT. The project is in collaboration with the City of Plano, City of Dallas, City of Richardson, North Central Texas Council (NCTCOG), Texas Department of Transportation (TxDOT), Texas Transportation Institute (TTI), and Southern Methodist University (SMU).

The project aims to improve the flow of travel in real-time the corridor through multimodal and multijurisdictional coordination.

Primary Agencies

- Dallas Area Rapid Transit (DART) – ICM Manager.
- **Plano, City of Dallas, City of Richardson** – Participated in development of the response plans and response through Traffic Management Centers (TMC).
- **North Central Texas Council (NCTCOG)** – Supported coordination, as agencies were accustomed to coordinating through NCTCOG meetings.
- **Texas Department of Transportation (TxDOT)** – Limited participation at first due to pilot nature of the project, role escalated in 2014 when it took on role of the ICM Coordinator.
- Texas Transportation Institute (TTI), and Southern Methodist University (SMU) – Involved from a research perspective.

Project Summary

Dallas Area Rapid Transit (DART) is the transit operator in Dallas, Texas and 12 surrounding cities, providing a wide range of services to over 200,000 passengers per day, including light rail, commuter rail, local bus, and paratransit service.

DART first lead the U.S.-75 Integrated Corridor Management (ICM) project, a collaborative and cooperative project for improving service along the U.S.-75 corridor; it is now lead by TXDOT. The project is in collaboration with the City of Plano, City of Dallas, City of Richardson, North

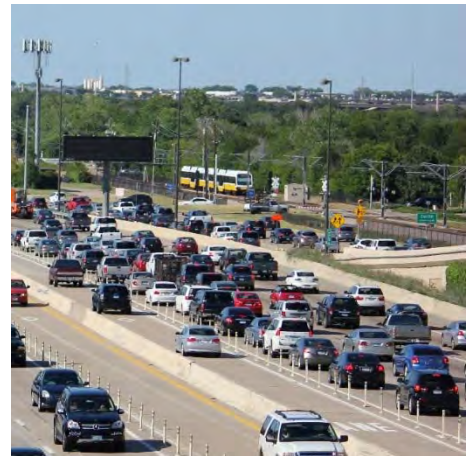


Central Texas Council NCTCOG), Texas Department of Transportation (TxDOT), Texas Transportation Institute (TTI), and Southern Methodist University (SMU). U.S.-75 ICM began its development in 2006 and became fully operational in 2013.

The project aims to improve the flow of travel in real-time the corridor through multimodal and multijurisdictional coordination. The travel corridor includes DART's Line Light Rail Transit (LRT) and bus network, U.S.-75, hundreds of signals, tollways, managed HOV lanes, numerous local arterials and multiple traffic management centers. Pre-established and approved plans, developed using a travel demand model, would be put into actions in response to major highway incidents, weather events, or other nonrecurring congestion. This cooperative management plan with the possible events and planned responses modeled was reviewed and approved by all partners in advance to allow for quick action. When an event occurs, all the participating agencies must provide verbal approval of the response plan to allow it to be implemented. With real-time data and preset responses, DART could make same-day decisions such as adding additional bus service or dispatching additional trains. As the lead agency in planning and implementing U.S.-75 ICM, DART leadership has identified key lessons learned that can be applied for future coordination. The lessons included having strong leadership with financial resources and technical expertise, having full-time staff solely working on the project, strong communication between involved partners, and utilizing the travel demand model to support consensus agreement on the response plan.

Challenges

- Lack of a long-term funding solution that goes beyond funding the initial implementation, especially if funding goes beyond staff time.
- Growing and changing highway infrastructure eventually caused the travel demand model to be outdated, so the ICM strategies did not capture options provided on the enhanced roadway network.
- Lack of a funding to update the travel demand model and for a full-time ICM coordinator beyond initial implementation.
- The ICM implementation required accepting that strategies may not be optimal for an individual agency or jurisdiction but would be optimal for the regional network.



Coordination Processes and Tools

There was successful cooperation and coordination between traffic engineers and planners. In this instance, creating travel demand models to select decisions and share information provided a forum that benefitted from expertise of both engineers and planners. The team applied software where needed, specifically for ICM, software that monitors speeds, sends out alerts, and recommends an appropriate response based on each situation. One key approach that led to agreement and success of the ICM pilot was the involvement of all agencies who all had to approve of the selected ICM plans in advance, but also real-time approval to execute any given response plan. This requirement for real-time approval was key to getting all agencies agree to the ICM project.

To support informed decision-making, the project relied heavily on data and analysis through use of the regional transportation demand model. For the U.S.-75 ICM, data was used to develop the model and the 144 predeveloped response plans. To implement these plans, the agencies assisted each other with solving problems affecting ICM and make things more streamlined, such as sharing servers. The agencies also met

frequently to review and improve the project, they conducted monthly meetings to discuss what did and did not work about the project, and how to improve aspects that needed work. A benefit of the coordination was that the project provided opportunity for more data sharing and collaboration across agencies.

The agencies also looked to a previous example of ICM to inform the Dallas area ICM, the project was informed by a similar plan in San Diego, CA. That project differed in that the system automatically implemented the changes (e.g., signal plan) rather than get agency approval.

Table 6. Summary of Multi-Agency Coordination

Process and Tools	Outcomes
Held hundreds of in-person meetings to incorporate stakeholder and public input.	<ul style="list-style-type: none"> • Facilitated coordination of fare structures between Rail Runner and bus service. • Maintained updates to the governing boards of jurisdictions along the line and at meetings of civic, religious, and neighborhood association groups. • Allowed the project team to receive a wide variety of viewpoints and ideas.
Worked with a wide cross-section of agency staff and disciplines in project planning, design, and implementation.	<ul style="list-style-type: none"> • Emphasized project benefits from the beginning, allowing agencies to understand the objectives and work towards completion within the ambitious timeline. • Avoided contentious issues. • Created a “problem-solving” mentality, drawing on cross-agency perspectives to address issues.
Implemented proactive coordination and communication methods to integrate modal services and schedules and update the public on progress.	<ul style="list-style-type: none"> • Ensured a high level of coordination during planning and construction with information posted on the Internet, including weekly website updates during construction. • Produced coordinated schedules between existing bus and shuttle service and Rail Runner.
Used existing planning processes to move the project forward within established timeframe.	<ul style="list-style-type: none"> • Vetted station locations through the MPO process with policy board members actively weighing in on decisions.
Created a strong branding strategy for Rail Runner.	<ul style="list-style-type: none"> • Created a distinctive, visible, and attractive identity for the commuter rail service and station. • Allowed a common reference for involved agencies and acted as a symbol of the success, transformation of the service, and attractiveness of the area.
Developed tools specifically to analyze and visualize project options.	<ul style="list-style-type: none"> • Built a combined travel demand model using Santa Fe and Albuquerque models. • Developed eye-catching maps to convey information to decision.

Process and Tools	Outcomes
Used an informal coordination process to leverage past relationships and ensure flexibility.	<ul style="list-style-type: none"> • Allowed MRCOG to act primarily as an agent of NMDOT for various project needs, allowing for an accelerated process. • Contributed to sense that each agency worked primarily to their strengths.

Role of the State DOT to Assist in the Delivery of Multimodal Transportation Solutions

Research into this case study has revealed several ways in which the State Department of Transportation can assist in the delivery of multimodal transportation solutions. For the ICM, U.S.-75 project, lessons regarding the role for the State DOT actions include the following:

- TXDOT supported the pilot project and matched partner funds. Role was first rather limited due to the project being a pilot test.
- Transportation Systems Management (TSM) – the ICM system utilizes the existing TxDOT Center-to-Center standards based communication infrastructure.
- Provides direct connections to agencies not on the Center-to-Center network.
- Consistent Project management involved DART, TxDOT, Richardson, NCTCOG, Plano, and the City of Dallas (Operations Committee, Technology Committee).
- The lead role of ICM Coordinator has transitioned to TxDOT as it has elected to convert the lanes into tolled Express lanes (HOV incentives are maintained).



Lessons Learned - Participant Perspectives

- Use data to make informed decisions. For ICM, data was used to develop the model and the 144 predeveloped response plans.
- Use of a travel demand model can help to inform decisions, share information, and provide a forum that benefited from expertise of both engineers and planners.
- Ensure involvement of all agencies who all have to approve of the selected ICM plan. For U.S.-75, this requirement for real-time approval was key to getting all agencies agree to the ICM project.
- Coordination aids in solving problems affecting ICM and making activities more streamlined, for U.S.-75, the sharing of servers is an example.
- Dedicate funding for a full-time ICM coordinator.

Use of a travel demand model can help to inform decisions, share information, and provide a forum that benefited from expertise of both engineers and planners.

Project Website: More information on this project can be accessed on the following website: https://www.transit.dot.gov/sites/fta.dot.gov/files/FTA0082_Research_Report_Summary.pdf

Webinar Summary/Results

Purpose of Webinars

The purpose of Webinar #1 was to present draft materials and gather feedback to improve deliverables. The purpose of Webinar #2 was to disseminate research findings.

Webinar 1 Results

Webinar #1 was presented to a group of attendees consisting of the NCHRP Panel, invited DOTs, and representatives of American Association of State Highway and Transportation Officials' (AASHTO) Multi-State Technical Assistance Program (MTAP).

The research team presented the purpose of the project, findings, and draft technical transfer document. The participants asked several questions during the webinar, including the following:

Question: In your research, did any studies experience a disagreement on the definition of success and how did they get to a common goal?

Response: *Research team indicated that this specific issue was not highlighted, but many indicated that past challenges came from not having goals aligned, and that current success was drawn, in part, from aligning planning and goal setting procedures.*

Question: What about agreeing on common metrics/measure of a project, specifically in a project that has multiple modes (e.g., transit, vehicles, bike/pedestrian), especially when the measures of success could be a benefit for one but not another? There is not a good guidebook on how to make decisions across modes in a corridor.

Response: *Research team suggests reviewing the Washington DOT I-5 Bus on Shoulder Project, and Practical Solutions concept as well as the LTD Portfolio Management Concept.*

Feedback provided from webinar participants included the following:

One panel member wanted to emphasize the challenges encountered by agencies, to show that the process isn't always straightforward and easy.

Response: *The researchers agreed to place some better emphasize this information, as shared by the agencies.*

One panel member commented that the project needs to have good outreach to State DOT representatives, to provide this information out to them and/or those who are likely to work on these types of projects. Might also be helpful to list out the type modes involved in the project, have a quick reference so people can quickly flip to the project most closely related to your situation.

Response: *Noted, dissemination is responsibility of the NCHRP and NCHRP panel.*

One panel member would like more consistency in Quick Reference Guide tables – “Coordination Process and Tools.”

Response: *Research team revised tables.*

One panel member suggested including icons for each case study highlighting the modes involved.

Response: *Research team added icons.*

During Webinar #2, the research team presented using the Microsoft PowerPoint presentation that is shown in annotated form in Appendix D. This presentation provides an overview of the project, the research

findings, and the technical transfer materials. Webinar #2 was presented to a small group of attendees consisting of members of the NCHRP Panel, invited DOTs, and representatives of American Association of State Highway and Transportation Officials' (AASHTO) Multi-State Technical Assistance Program (MTAP). The technical transfer documents including the final presentation can be downloaded from the project website:

<http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4156>

Recommended Federal Guidance

FTA and FHWA Guidance on Multimodal Transportation Planning and Project Delivery

The U.S. DOT, and its Federal agencies, the FHWA and FTA, publish guidance for planners, officials, engineers, and other stakeholders to assist them in planning and delivering projects. As part of this research, a synthesis of current U.S. DOT, FHWA, and FTA guidance regarding multimodal project planning and delivery is provided.

After an exhaustive review of Federal guidance on this topic for NCHRP 20-65 Task 67 CS concluded only generalized (versus specific) direction is available to both address FHWA/FTA compliance requirements and navigate the complex process of planning, funding, and coordinating the delivery of multimodal improvements. Therefore we have prepared recommendations to address “Federal Guidance Gaps” at the end of this section.

Furthermore our research was specific to guidance that addresses multimodal projects and does not include a synthesis of all guidance for projects that are one ‘siloes’ component of a project. Interview findings suggest that this ‘siloes’ modal guidance is one of the challenges of planning and delivering multimodal projects because projects with roadway and transit components must comply with state, FHWA, and FTA requirements, that are frequently not aligned nor consistent.

In addition to one-on-one discussions regarding guidance used by interviewees during the investigative interviews, and with key senior advisors to this project, the researchers reviewed a number of online sources for guidance. This include a series of web-based key-word searches, searching within the U.S. DOT website, and a full review of the following FHWA and FTA web pages dedicated to providing guidance, a link is provided to each webpage for the dedicated pages:

- Fixing America’s Surface Transportation Act or “FAST Act,” Guidance and Regulations: <https://www.fhwa.dot.gov/fastact/guidance.cfm>.
- MAP-21 – Moving Ahead for Progress in the 21st Century: <https://www.fhwa.dot.gov/map21/guidance/>.
- Federal Transit Administration Regulation and Guidance: <https://www.transit.dot.gov/regulations-and-guidance/regulations-and-guidance>.
- Federal Transit Administration Final Circulars: <https://www.transit.dot.gov/regulations-and-guidance/fta-circulars/final-circulars>.
- Federal Highway Administration, the Federal-aid Highway Program Policy and Guidance Center: <https://www.fhwa.dot.gov/pgc/index.cfm?ccat=25>.
- Federal Highway Administration Bicycle and Pedestrian Program Guidance: https://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/index.cfm.

Due to the very limited amount of guidance encountered in the scan, when the scan revealed additional information that was exceptionally relevant to this research topic, but was not technically ‘guidance,’ it was included in the synthesis to provide the most robust response possible. Table 7 includes the list of guidance synthesized for this report. Where included, they are noted as ‘not technically guidance.’

The synthesis of guidance and related information is organized components into the following sections:

- Multimodal Planning;
- Environmental Planning;
- Grant Programs;
- Project Development and Management; and
- Multijurisdictional Planning.

Table 7. Reviewed Federal Guidance Documents

Date	Author	Title
Multimodal Planning		
2014		MAP-21 Multimodal Projects and Eligibility to Use the 49 U.S.C § 304 Process.
N/A		NEPA Implementation – Fixing America’s Surface Transportation (FAST) Act: Questions and Answers on the Applicability of 23 U.S.C. 139 to FHWA, FRA, & FTA projects (<i>not technically guidance</i>).
Grant Program Guidance		
2016	FTA	Final Interim Policy Guidance Federal Transit Administration Capital Investment Grant Program.
2014	FTA	Federal Transit Administration Guidance on Joint Development Circular.
2014	FTA	Guidance for Implementation of FTA’s Categorical Exclusions.
2008	FTA	Program Guidance for Metropolitan Planning and State Planning and Research Program Grants.
Project Development and Management		
2016	FTA	Project and Construction Management Guidelines.
2015	FTA	Key Factors of Successful Project Implementation (<i>not technically guidance</i>).
2014	FHWA	Cross-Modal Project Prioritization – A Transportation Planning Capacity Building (TPCB) Peer Exchange (<i>not technically guidance</i>).
Multijurisdictional Planning Reports (<i>not technically guidance</i>)		
2014	FHWA	Role of Regional Planning Organizations in Transportation planning Across Boundaries (<i>not technically guidance</i>).
2013	FHWA	How to Improve Performance on Corridors of National Significance (<i>not technically guidance</i>).
2012	FHWA	Megaregions Planning for MPOs and Partners – A TPCB Peer Exchange (<i>not technically guidance</i>).
2011	FHWA	Literature Review of Organizational Structures and Finance of Multijurisdictional initiatives and the implications for Megaregion Transportation Planning in the U.S. (<i>not technically guidance</i>).
2010	FHWA/FTA	Statewide Opportunities for Integrating Operations, Safety, and Multimodal Planning: A Reference Manual (<i>not technically guidance</i>).

Synthesis of Guidance on Multimodal Project Planning and Delivery

Multimodal Planning. The online guidance, MAP-21 Multimodal Projects and Eligibility to Use the 49 U.S.C § 304 Process, provided in a question and answer format, addresses the application of categorical exclusions (CE) for multimodal projects, as specified in Section 1314 of the Moving Ahead for Progress in the 21st Century Act (MAP-21). This guidance, effective as of October 1, 2012. As stated, “Section 1314 amends 49 U.S.C. § 304 to create an environmental review process that, under certain conditions, allows one Department of Transportation (DOT) operating administration or agency, the operating authority under 49 USC 304, (OA) to use the CE of another OA.”² This guidance can be accessed through the following web link: <https://www.fhwa.dot.gov/map21/qandas/qacemp.cfm>.

Environmental Planning. While not technically guidance, information regarding the applicability is referenced here as it applies to FHWA and FTA projects, that could include multimodal projects: NEPA Implementation – Fixing America’s Surface Transportation (FAST) Act: Questions and Answers on the Applicability of 23 U.S.C. 139 to Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), & Federal Transit Administration (FTA) projects. This webpage provides information on applicability in a question and answer form, the web link for this page is: https://www.environment.fhwa.dot.gov/projdev/FAST_act_guidance_23USC139.asp.

Grant Program Guidance. The FHWA and FTA provide guidance regarding how to meet the requirements of grants and other funding sources made available to providers. Some multimodal projects may be able to utilize existing grant sources for funding, *however, guidance for specific to grants that support multimodal projects was not discovered during the scan.* Individual grant programs are usually tailored towards a specific purpose or project type, such as mobility for seniors/individuals with disabilities (Section 5310) or new transit capacity (Capital Investment Grant Program).

The researcher reviewed numerous FTA guidance documents including those listed below, however, each document largely spoke to specific aspects of transit projects, without addressing any specific guidance to the planning and delivery of multimodal projects. The researchers also reviewed comparable FHWA guidance, but did not find specific guidance regarding grants that apply to multimodal projects.

- Final Interim Policy Guidance Federal Transit Administration Capital Investment Grant Program – This document provides no relevant information specific to multimodal projects.
- Federal Transit Administration Guidance on Joint Development Circular – This document provides no relevant information specific to multimodal projects.
- Guidance for Implementation of FTA’s Categorical Exclusions – This document provides a limited amount of guidance for multimodal projects, including: that “multimodal projects containing both FHWA-funded and FTA-funded elements (such as the reconstruction of a highway lane within existing right-of-way for express bus service) may be processed as CEs under section 771.117 for FHWA and under section 771.118 for FTA, as appropriate.”³ This document also provides limited information on combined FHWA/FTA funding and project budget information, including a sample budget sheet.
- Program Guidance for Metropolitan Planning and State Planning and Research Program Grants (FTA C 8100.1C) – This circular “is a re-issuance of program guidance and application instructions for applying for grants under the Metropolitan Planning Program (MPP) and the State Planning and Research Program (SPRP) authorized at 49 U.S.C. 5305.”⁴ It provides guidance regarding the Consolidated Planning Grant (CPG) Program, which is applicable to an overall work program rather than a specific project. This program allows the States and MPOs to merge FTA

² Retrieved from: <https://www.fhwa.dot.gov/map21/qandas/qacemp.cfm>.

³ Guidance for Implementation of FTA’s Categorical Exclusions, page 16.

⁴ Program Guidance for Metropolitan Planning and State Planning and Research Program Grants, page 1.

metropolitan or statewide planning funds with FHWA Planning (PL) funds to provide States support for both highway and transit planning activities in single consolidated grants. This guidance is relevant as the CPG Program enables States/MPOs to decide whether planning funds will be consolidated for administration under FTA or FHWA. The designated “Lead Grant Agency” will have day-to-day responsibility for grant administration, such as work program changes, allowable cost determination, or audit processing. In all cases, the “Lead Grant Agency” will coordinate and solicit input from the other agency on major issues, such as work program approval and grant closeout.⁵

For the purpose of reference, to supplement the synthesis, FTA and FHWA guidelines on grants can be found in the following documents and on noted websites:

- FTA provides many grants to states, tribes, and local public agencies to support the growth of public transit systems in the United States. Grantees must comply with statutory and regulatory requirements associated these federally funded grants. FTA provides guidance, primarily in the form of ‘circulars’ to ensure compliance with the administration of these grants. CS reviewed all current circulators.
- Information on FTA Regulation and Guidance can be accessed using the following web link: <https://www.transit.dot.gov/regulations-and-guidance/regulations-and-guidance>.
- The U.S. Department of Transportation made available “The Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards,” in 2014, also known as “the Super Circular” or “Uniform Guidance.” This circular establishes the pre- and post-award requirements for grantees. FTA also provides guidance for post-award grant administration and project management activities in its Grant Management Requirements circular.
- Fixing America’s Surface Transportation Act or “FAST Act,” <https://www.fhwa.dot.gov/fastact/guidance.cfm>.
- Office of the Chief Financial Officer grants guidance: <https://www.fhwa.dot.gov/cfo/>.

Project Development and Management. As explored in the literature review, multimodal projects need strong management throughout project development and delivery. This can be especially true for multimodal projects due to project complexity and due to the number of involved agencies, organizations, and individuals. The FTA and FHWA provide information and guidance on effective project development for individual modes but not for multimodal projects. The information and guidance for individual modes ranges from a brief summary of successful case studies to detailed guidelines for every step of project development. FTA’s *Key Factors of Successful Project Implementation (not technically ‘guidance’)* provides a brief overview of the top 10 factors for successful projects, primarily gathered from major transit projects. These lessons can be extended to coordination for multimodal projects. The top factors include:

- Clear understanding of what can be achieved given the resources and limitations of the team;
- Adequate project management plan;
- Adequate input from stakeholders and all involved agencies/organizations during planning design and scope;
- Adequate project management and project control capability;
- Well managed ROW acquisition;
- Adequate schedule;
- Adequate cost estimating and budget;
- Comprehensive public outreach, information, and communications program;
- Well developed, fair, and comprehensive contract documents; and
- Adequate underground investigation during preliminary engineering.

⁵ Program Guidance for Metropolitan Planning and State Planning and Research Program Grants, page IV-1.

The FTA provides detailed guidance on transit capital projects through the *Project and Construction Management Guidelines*. This dense report provides guidance for every phase during project development.

Additional information is provided for specific phases of project development, including project prioritization which could determine if a multimodal project moves forward with research, funding, and construction. The report *Cross-Modal Project Prioritization, a Transportation Planning Capacity Building (TPCB) Peer Exchange* outlines key recommendations and best practices for project prioritization across transportation modes. Selecting a prioritization process that is fair and unbiased towards all modes could lead to more multimodal projects and a wider array of transportation solutions.

Multijurisdictional Planning. A major component of multimodal project planning is coordination and collaboration across jurisdictions and agencies. Required processes to plan and implement regional transportation solutions span across political and agency service boundaries. Specific guidance on multijurisdictional planning for multimodal projects was not identified in the scan, however, the FHWA has provided several reports on how to coordinate across these boundaries, with many of these sources applicable to multimodal projects. A summary of these reports follows:

- FHWA’s Literature Review of Organizational Structures and Finance of Multijurisdictional Initiatives and the Implications for Megaregion Transportation Planning in the U.S. (not technically guidance) provides case studies on multijurisdictional cooperation, such as coordination across multiple MPOs and addressing infrastructure challenges that span multiple jurisdictions. This document also offers a governance framework for megaregions. This framework focuses on data collection and sharing, knowledge exchange, and funding/financing. These case studies can serve as examples for how to structure and coordinate across agencies, which could be applicable to multimodal project planning and delivery.
- The TPCB Peer Exchange report, *Megaregions Planning for MPOs and Partners* (not technically ‘guidance’), provides best practices and key themes on how MPOs approached megaregional planning and projects. One of the major themes from this summary was how alternative transportation plays an important role in megaregional planning, particularly in coordinating with rural and small communities that may have different planning priorities from urban or suburban areas. Engaging rural and small communities and demonstrating benefits of alternative transportation to rural and small metropolitan areas can spur regional planning discussions and lead to more successful regional multimodal projects.
- FHWA’s report, *Role of Regional Planning Organizations in Transportation Planning Across Boundaries* (not technically ‘guidance’), encourages engaging rural stakeholders, including Regional Planning Organizations (RPO), in the transportation planning process. Understanding the benefits and barriers to RPOs becoming involved in the planning process as well as their perceptions of larger planning projects and their daily operations, can help involve these agencies in the multimodal planning process.
- FHWA’s *Statewide Opportunities for Integrating Operations, Safety, and Multimodal Planning: A Reference Manual* (not technically ‘guidance’) provides information on how transportation professionals can integrate operations, safety, and multimodal planning at the statewide, regional, corridor, and project level. This document outlines the benefits, challenges, and recommendations for this integration and provides case study examples.
- FHWA’s ‘How to Improve Performance on Corridors of National Significance’ (not technically ‘guidance’), offers case studies with best practices that apply to multimodal projects. Planning for corridors often involves multiple state, regional, and local governments, and multiple transportation agencies with each organization having authority and responsibility for a particular facet of the corridor facility or operations. The document provides recommendations for coordination,

organization, and government among these corridor organizations, which can be extended to projects that involve multiple agencies and partners.

FTA and FHWA provide additional resources regarding single-mode project planning and delivery on the FTA and FHWA websites (see: <https://www.fhwa.dot.gov/resources> and <https://www.transit.dot.gov/regulations-and-guidance/regulations-and-guidance>).⁶ In the future, guidance can be expected for implementation of the recent legislation and final rule for transportation planning (see: <https://www.Federalregister.gov/documents/2016/05/27/2016-11964/statewide-and-nonmetropolitan-transportation-planning-metropolitan-transportation-planning>).

Federal Guidance: Gaps and Recommendations

The overarching guidance gap from FTA and FHWA is the lack of information specifically on multimodal projects, in particular for projects with highway and transit components. Currently, guidance at the Federal level concentrates on specific project types, modes, and management. Multimodal ‘best practices’ reports primarily originate from NCHRP, TCRP, and other research publications, usually outlining best practices through case studies. This may be due to a lack of Federal funding specified for multimodal projects, which usually rely on a variety of local, state, and Federal funding sources. In addition, due to multimodal projects covering a wide array of transportation modes, challenges, and implementing partners, there is not guidance that clearly speaks to each unique project.

Gaps in the guidance were also expressed during the investigative interviews. Findings indicate that many multimodal projects were hindered due to project partners needing to clarify the inconsistencies amongst state, FHWA, and FTA requirements. For example, one project found that removing FHWA funding streamlined the process and allowed the project be completed, because having to navigate both FHWA and FTA requirements was extremely challenging. Others found it unclear which guidance to follow or were not able to receive funding in a timely manner due to conflicts in FHWA and FTA requirements and lack of agreement between these two agencies. While a number of the recommendations provided might be challenging to implement based on the organizational nature of the U.S. DOT, these recommendations are nevertheless included herein. The overall gaps, and proposed recommendations to address each gap, are listed below:

- There is a lack of a single location for multimodal guidance.
- **Recommendation:** Consider creating a website devoted to guidance and direction on multimodal projects.
- There is little guidance on the steps need to be taken from the beginning to end of a multimodal project.
- **Recommendations:**
 - Consider providing joint FTA/FHWA guidance for common types of multimodal projects, on a webpage dedicated to multimodal project guidance; (E.g., guidance for specific common multimodal project types (e.g., BRT with designated lanes, multimodal stations, any facility that includes right-of-way for two or more modes);
 - Consider providing guidance and best practices on how to meet both FHWA and FTA requirements for projects that receive both FHWA and FTA funding. This guidance would focus on approaches to navigating and complying with all planning and programming FHWA and FTA compliance requirements throughout a project;
 - Consider providing joint FHWA/FTA guidance that indicates for each possible multimodal project type/situation, which Federal agency should be the lead or which Federal requirements should be

⁶ <https://www.transit.dot.gov/regulations-and-guidance/regulations-and-guidance>.

followed (rather than both FHWA and FTA) would be exceptionally helpful in facilitating project advancement; or

- Consider providing “One U.S. DOT” guidance. Considering having FHWA and FTA jointly address compliance requirements and take steps to make compliance more straight forward. An example to consider could be the “One DOT” agreement signed for the ‘T-Rex’ project in Denver. This document’s purpose was primarily to set the principles that the agencies would move forward with one set of rules and one set of guidelines. (Each agency did keep their own DBE rules).
- Clear guidance is not available on when to initial coordination with FHWA or FTA on a multimodal project.
- **Recommendation:** Consider developing guidance providing a better understanding as to when to approach FHWA/FTA or when to start the National Environmental Policy Act (NEPA) process. This would streamline the project and decrease confusion. Where conditions are right, there should be early notification and coordination with FTA/FHWA. Consider recommending ‘trigger points’ for initiating or accelerating coordination with the Federal agencies.
- Although there is guidance on NEPA, the full array of options for multimodal projects is not highly visible:
- **Recommendation:** Consider providing more information or guidance as to NEPA options (such as using the Tiered NEPA approach), on a webpage dedicated to multimodal project guidance.
- The definition of ‘multimodal’ is unclear.
- **Recommendation:** Consider establishing a common FHWA/FTA definition of this term and providing examples of project types, components, or criteria to meet this definition.
- Similar to other guidance gaps for multimodal projects, projects that receive grants from more than one Federal funding source are hindered by two sets of grant compliance requirements.
- **Recommendation:** For Federal grant receipt and utilization – consider providing FHWA and FTA guidance on how to interpret guidance from two Federal agencies, or as indicated above, consider developing joint guidance.
- There is not guidance on multimodal agency coordination.
- **Recommendation:** Consider providing guidance for specific agency-agency type interactions to ensure compliance with Federal requirements (e.g., UTA/UDOT, transit agency/MPO).

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APPENDICES

Appendix A: Literature Review

Literature Review

Overview

Robust research in the field of transportation innovation is served well by drawing lessons from an extensive literature review. The literature review to support NCHRP 20-65 Task 67, Multimodal Coordinated Project Planning includes scholarly papers, prior NCHRP reports, and a national scan of multimodal components or topic areas related to this level of coordinated planning. The national scan endeavored to discover pertinent content within topic areas for High Occupancy Vehicles/High Occupancy Toll (HOV/HOT) lanes with park and ride, highway redevelopment with light rail transit (LRT), transit station redevelopment, Integrated Corridor Management (ICM)/Intelligent Transportation Systems (ITS) with transit, regional studies and research, long range plans, and automated and connected vehicles for transit. Following the literature review Cambridge Systematics, Inc. (CS) also identified and reviewed Federal guidance that applies to the coordination of multimodal projects. The examination of historical and recent practice, and Federal guidance from the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) subsequently informed ten investigative interviews. An Interview Guide provided structure to each interview and CS used responses, panel input, and a criteria-based decision matrix to recommend more detailed case studies to conduct in Task 2 of this NCHRP project.

Literature Review

Our research started with a scan of summarized literature related to multimodal transportation planning, particularly the best practices in coordination across transportation agencies and partners as they relate to multimodal coordinated project planning. The review is organized into three sections: 1) a profile of select literature; 2) a summary of the literature; and 3) key findings. The literature profiles are organized into the following categories: General Multimodal Coordination; Collaboration and Coordination in Transportation Planning; and literature with a Specific Focus on Corridors, Metropolitan Regions, MPOs, and Modes

The review provides a summary of the following information:

- Location and agencies covered;
- Types of multimodal projects covered;
- Types of multimodal coordination covered; and
- Brief summary of key findings.

A listing of the literature CS reviewed is provided in Table 8.

Table 8. List of literature reviewed.

Author	Title
General Multimodal Coordination	
Florida International University	State-of-the-Practice for Advancing Planning and Operations Integration Opportunities within Transportation Agencies
Goeltz, A.R, Sziliowicz, J.S., Vowles, T.M. and Taylor, G.S., National Cooperative Highway Research Program	Assessing Intermodal Transportation Planning at State Departments of Transportation Best Practices in Project Delivery Management
Sonnenberg, A.H, Southworth, F., Meyer, M., and Comer, C., National Cooperative Highway Research Program	Statewide Multimodal Planning: Current Practice at State DOTs Advances In Strategies For Implementing Integrated Corridor Management (ICM)
National Cooperative Highway Research Program	Successful Intermodal Corridor Management Practices for Sustainable System Performance
Collaboration and Coordination in Transportation Planning	
Campbell, S., Coogan, M., Leach, D., and Meyer, M. Georgia Department of Transportation	Collaboration: The Key to Success in Transportation Multimodal Needs, Constraints, and Opportunities: Observations and Lessons Learned For Georgia and GDOT
Specific Focus on Corridors, Metropolitan Regions, MPOs, and Modes	
Peckett, H., and Lyons, W., Transit Cooperative Research Program	Evolving Role of Metropolitan Planning Organizations in Transportation Planning for Megaregions Regional Organizational Models for Public Transportation Final Report.
Transit Cooperative Research Program	Reinventing the Urban Interstate: A New Paradigm for Multimodal Corridors
National Center for Transit Research	Evaluation of Automated Vehicle Technology for Transit – 2016 Update

Table 9. General multimodal coordination.

PUBLICATION TITLE	
State-of-the-Practice for Advancing Planning and Operations Integration Opportunities within Transportation Agencies	
AUTHOR	YEAR
Florida International University	2014
LOCATIONS	AGENCIES
Nationwide	Various
MULTIMODAL PROJECTS COVERED	
Publication did not focus on specific projects, instead focuses on coordination between transportation planning and operations, regardless of transportation mode.	
MULTIMODAL COORDINATION COVERED	
The document focused on coordination approaches across planning documents, committees, jurisdictions, and stakeholders.	
KEY FINDINGS	
Linking planning and operations are composed of three key components:	
<ul style="list-style-type: none"> ▪ Institutional: shared vision, regional goals, and joint resource arrangement. ▪ Functional: mainstreaming operations thinking into the business programs, establishing relationships and procedures, and consolidating services. ▪ Information: data and information sharing among agencies, monitoring performance measures, and developing analysis tools. 	
This integrated framework can occur at various procedures and efforts, such as Federally required documents (LRTP, TIP), corridor/regional studies, and performance monitoring. The document also summarizes key elements and steps to facilitate linking planning and operations efforts, including the following:	
<ol style="list-style-type: none"> 1. Establish special committees and task forces. 2. Develop shared visions and specific objectives. 3. Dedicate funding sources for sustainable program. 4. Promote frequent communications among involved stakeholders. 5. Develop Memorandum of Understand (MOU)s and plans to set priorities and needs. 6. Develop standards and procedures to facilitate data integration and sharing. 7. Target specific programs and business areas. 	

PUBLICATION TITLE

Assessing Intermodal Transportation Planning at State Departments of Transportation*

This report focused on intermodal practices, focusing on non-highway modes such as rail, air, and transit, rather than multimodal practices. The information presented only relates to transit-related multimodal projects.

AUTHOR

YEAR

Goeltz, A.R, Sziliowicz, J.S., Vowles, T.M. and Taylor, G.S.,

2004

LOCATIONS

AGENCIES

Arizona, Colorado, Texas, Alabama, Florida, Louisiana, Mississippi

U.S. DOT

MULTIMODAL PROJECTS COVERED

Respondents from the seven states surveyed in this document highlighted the best multimodal (intermodal) projects. This included:

- HOV lanes with park & ride facilities.
- Highway redevelopment with light rail (Transportation Expansion [T-REX] in Denver, Tri Rail in Florida).
- Transit station redevelopment serving multiple transit modes with transit-oriented development (Denver Union Station).

MULTIMODAL COORDINATION COVERED

The document focused on intermodal planning within seven states, with most of the coordination within the state boundaries. The document covered a wide range of agencies, such as:

- State Departments of Transportation (DOT)s;
- MPOs;
- Transit Agencies;
- City Governments;
- FHWA/FTA; and
- Consultants.

Specific information on coordination is not provided.

KEY FINDINGS

This research concluded that State DOTs are still highway-focused but intermodal discussions and focus on multimodal projects are slowly becoming common. Many DOTs have also altered internal organization to support intermodal collaboration. The research noted that commissions, legislatures, leaders, and staff all need to be in agreement with the intermodal vision to increase efficiency and to enable the successful planning and implementation of multimodal projects.

Related to this literature review, Colorado had the most relevant multimodal projects and discussions. Some key findings from this state include:

- The political climate could support or discourage coordination, depending on the project.
 - A design-build approach can shorten project construction/planning.
 - An agency's organizational structures can help streamline the implementation process.
-

PUBLICATION TITLE

Best Practices in Project Delivery Management**AUTHOR****YEAR**

National Cooperative Highway Research Program

2009

LOCATIONS**AGENCIES**

Arizona, Florida, Missouri, Utah, Virginia, Washington

Various

MULTIMODAL PROJECTS COVERED

This research concentrated on overall project delivery, rather than citing specific multimodal projects.

MULTIMODAL COORDINATION COVERED

The document concentrated on project delivery within selected states, with coordination cited between State DOTs, MPOs, transit agencies, city governments, FHWA/FTA, and consultants. The importance of community involvement throughout the stages of the project was also noted.

KEY FINDINGS

Best practices in project delivery were defined among detailed focus areas, with a summary of the findings below:

- **Project management:** cohesive, multidisciplinary teams with good communication, defined roles, and accountability along with shared leadership, mitigating and managing risk, use of consultants when appropriate, investing in data management, and maintaining core competencies.
 - **Performance measures:** an established performance management system with a contemporary public accountability program.
 - **Contracting practices:** innovative construction contracting such as Florida's design-build (DB) or Utah's Construction Manager General Contractor (CMGC) to improve relationships, decrease claims, increase project delivery and quality, and maintain cost control.
 - **Community involvement activities:** include early and continuous community involvement from concept through construction through a variety of media and maintain external relationships with outside stakeholders (e.g., service providers, agencies, and third parties).
-

PUBLICATION TITLE

Statewide Multimodal Planning: Current Practice at State DOTs

AUTHOR

YEAR

Sonnenberg, A.H, Southworth, F., Meyer, M., and Comer, C.,

2014

LOCATIONS

AGENCIES

Nationwide

State DOTs

MULTIMODAL PROJECTS COVERED

Specific multimodal projects were not discussed in this paper. Instead, the research focused on how state DOTs emphasize multimodal solutions in transportation planning.

MULTIMODAL COORDINATION COVERED

The survey analyzed in this research focused on how multimodal tasks are handled within the state DOT, identifying what areas of coordination are strong and lacking within the organization. Some survey topics discussing this relationship include:

- Modal responsibilities within departments;
 - Modal plans (e.g., modes involvement in planning activities, evaluation criteria, changes in past 10 years);
 - Flexibility of funding among different modes;
 - Staffing levels for different modes; and
 - Barriers and support for successful coordination.
-

KEY FINDINGS

This report summarized a multimodal-focused survey distributed to all state DOTs. In addition to learning more about common coordination and organizational structures, the survey summarized critical issues serving as barriers to making a truly multimodal state DOT. This includes:

- **Funding:** lack of flexible funding across modes;
 - **Culture:** need a shift from automobile and highway focused investments towards alternative modes of transportation within agencies and among populations;
 - **Leadership:** need for strong leadership at the DOT, governor, and throughout the entire agency to emphasize the importance of multimodal planning;
 - **Institutional issues:** fragmented ownership and operation of different modes;
 - **Communication:** not all partners and stakeholders being engaged;
 - **Mode bias:** need for mode-neutral planning to select the most effective solution instead of planning according to available funding; and
 - **Staff and tools:** need for ongoing staff development and training as well as adequate data, analysis, and decision-making tools across multiple modes.
-

PUBLICATION TITLE

Advances In Strategies For Implementing Integrated Corridor Management (ICM)

AUTHOR
YEAR

National Cooperative Highway Research Program

2014

LOCATIONS
AGENCIES

New Jersey, Texas, Minnesota, Arizona, California

State DOTs, Committees, MPOs, City DOTs, Transit Agencies, Port Authorities, Local Governments, Private Companies, Universities, Consultants

MULTIMODAL PROJECTS COVERED

While specific multimodal projects were not discussed, the report focused on Integrated Corridor Management (ICM), concentrating on items relating to monitoring traffic operations and performance. The authors visited ICM systems in selected states and cities to understand these projects better. Some ICM systems with a multimodal, transit component include:

- I-35W in Minneapolis
- U.S.-75 in Dallas

MULTIMODAL COORDINATION COVERED

ICM requires coordination across a wide range of agencies due to many of these corridors crossing political boundaries. The types of coordination topics covered included:

- Traveler information;
- Decision support system;
- Corridor modeling;
- Coordinated operations;
- Multiagency data sharing; and
- Memorandums of Understanding.

KEY FINDINGS

The findings of this report focused on the key items needed for a successful ICM program. This included:

- **A champion** to start the program and begin the momentum for the program to become routine.
 - Available **roadway capacity** to manage a corridor through a multiagency/multimodal approach.
 - **Exchange of data** across agencies, such as an automated data sharing system.
 - Open **communication and cooperation** among agencies, either formally or informally.
 - **Coordinated response** to events with an agreed upon response plan.
 - A sustainable and committed **funding source** for ongoing operations and maintenance.
 - View as a long-term commitment and have adequate number of **staff**.
-

PUBLICATION TITLE

Successful Intermodal Corridor Management Practices for Sustainable System Performance

AUTHOR**YEAR**

National Cooperative Highway Research
Program

2016

LOCATIONS**AGENCIES**

MULTIMODAL PROJECTS COVERED

MULTIMODAL COORDINATION COVERED

KEY FINDINGS

Note: This report was recommended in our proposed Work Plan based on expected October 2016 publication. As of this writing it is still unreleased; CS recommends footnoting its reference and incorporating any relevant findings which support our research conclusions in fall 2017.

Collaboration and Coordination in Transportation Planning

PUBLICATION TITLE	
Collaboration: The Key to Success in Transportation	
AUTHOR	YEAR
Meyer, M., Campbell, S., Leach, D., and Coogan, M.	2005
LOCATIONS	AGENCIES
Nationwide	DOTs, MPOs, Transit Agencies, Elected Officials
MULTIMODAL PROJECTS COVERED	
This research paper concentrated on collaboration across agencies and didn't highlight specific projects.	
MULTIMODAL COORDINATION COVERED	
<p>This paper solely concentrated on coordination across transportation agencies and included information on why collaboration occurred, collaboration observation, and the multistep process of collaboration. Some case studies describing why collaboration and coordination across modes happened includes:</p> <ul style="list-style-type: none"> ▪ Availability of funding and maximizing infrastructure investments; ▪ Need for an information exchange across operators; ▪ Prevent conflicting construction schedules; ▪ Sharing risks associated with new or innovative projects; and ▪ Preparing for planning and unexpected events. 	
KEY FINDINGS	
<p>The research found that successful transportation collaboration had strong interpersonal and intra-organizational relationships primarily due to previous collaboration efforts. Further guidance is needed to determine how to sustain collaboration success for the long term, i.e., through agency change, project complexity, staffing transitions, etc. Outlined are a series of steps/sequences within a successful collaboration process:</p> <ol style="list-style-type: none"> 1. Identifying and Acknowledging Common Purpose, Motivation, and Needs; 2. Establishing Ground Rules and a Decision-Making Framework; 3. Determining Who will Assume Responsibility for Collaborative Activities; 4. Establishing Communication Capabilities Among Those Participating in the Collaboration; 5. Coordinating Activities of Partners While Each Uses Own Procedures; 6. Coordinating Activities of Partners with Agreed-On Standard Practices; 7. Maintaining Momentum: Coordinating Activities Through Shared Funding, Management, and Accountability; 8. Establishing New Organization to Purpose Goals of Collaboration; and 9. Supporting and Nurturing Resulting Levels of Collaboration. 	

PUBLICATION TITLE

Multimodal Needs, Constraints and Opportunities: Observations & Lessons Learned For Georgia & GDOT

AUTHOR
YEAR

Georgia Department of Transportation 2013

LOCATIONS
AGENCIES

Georgia and Nationwide State DOTs (primarily Georgia Department of Transportation)

MULTIMODAL PROJECTS COVERED

State DOT case studies were highlighted in this publication, concentrating on various example multimodal activities rather than specific projects. Some of these activities include:

- Identification of multimodal transportation networks;
- Dedicated multimodal funding; and
- Integrated land use and transportation planning.

MULTIMODAL COORDINATION COVERED

State DOT case studies concentrated on multimodal planning activities, many of which required various transportation agencies, modes, and divisions to cooperate in order to be successful. While the coordination of the modes were not the primary objective of the research, examples of how State DOTs were structured to support and encourage multimodal coordination were shared. These organizational structures aimed to reduce silos.

KEY FINDINGS

This publication focused on specific needs, constraints, and strategies to improve multimodal planning within the Georgia Department of Transportation, including:

- **Policy/Legislative/Funding Issues:** seek top down support, maximize use of existing funds, encourage bottom-up funding initiatives, initially focus on potentially high payoff multimodal policies.
- **Multimodal Planning and Program Activities:** promote pro-active multimodal planning, choose project then find funding, expand role of multimodal planning and project development, and improve staffing resources and training.
- **Inter-Organization Activities:** collaborate with land use and economic development organizations, develop tools or techniques to improve interagency coordination, prepare a guidebook, and clearly define agency roles.
- **Multimodal Performance Measures, Planning Tools, and Data Needs:** use tools to inform policy decisions and project prioritization, identify a multimodal transportation network, share data between agencies and businesses, and have non-highway performance measures and make performance and trends available to the public.

Note: This document was prepared by the same authors who produced *Statewide Multimodal Planning: Current Practices* thereby resulting in some overlapping conclusions.

Specific Focus on Corridors, Metropolitan Regions, MPOs, and Modes

PUBLICATION TITLE	
Evolving Role of Metropolitan Planning Organizations in Transportation Planning for Megaregions	
AUTHOR	YEAR
Peckett, H., and Lyons, W.,	2014
LOCATIONS	AGENCIES
Nationwide	MPOs and partners
MULTIMODAL PROJECTS COVERED	
<p>Seven different MPOs with large-scale transportation planning efforts were analyzed in this report, including the following multimodal projects and initiatives:</p> <ul style="list-style-type: none"> ▪ Regional rail projects and studies (e.g., SunRail Commuter Rail Transit Line); ▪ Comprehensive community vision/planning (e.g., myregion.org in Central Florida, regional transportation plans); ▪ Front Range Express (Colorado); ▪ I-95 Corridor Coalition; and ▪ Multimodal Studies (NGTA Corridor, Mohawk-Erie Multimodal Transportation Corridor Study). 	
MULTIMODAL COORDINATION COVERED	
<p>The research concentrated on coordination across MPOs and traditional political boundaries, taking a megaregion approach for transportation planning. Among the examples explored in the research, the types of coordination detailed included:</p> <ul style="list-style-type: none"> ▪ Working with multiple jurisdictions and agencies (MPOs, cities, counties, DOT, countries); ▪ Identifying common goals, initiatives, and priorities; ▪ Conducting studies and research; and ▪ Data sharing. 	
KEY FINDINGS	
<p>The study summarized the overall role and creation of megaregions, rather than focus on specific projects and initiatives. These findings include:</p> <ul style="list-style-type: none"> ▪ Megaregions' roles are evolving and have participated in other transportation planning efforts; ▪ A common motivation/issue identified by MPOs and other participants often starts a megaregion organization but can evolve into targeting other planning activities; ▪ The definition of a megaregion's boundary is constantly changing; ▪ There are two models of megaregion's structure and growth: project-based and coordination forums; and ▪ MPOs have a key role in the creation of megaregions. 	

PUBLICATION TITLE	
Regional Organizational Models for Public Transportation Final Report	
AUTHOR	YEAR
Transit Cooperative Research Program	2011
LOCATIONS	AGENCIES
Nationwide	Public Transportation Agencies
MULTIMODAL PROJECTS COVERED	
Specific multimodal projects are not discussed in this research, instead focusing on the governance models among U.S. transit systems.	
MULTIMODAL COORDINATION COVERED	
<p>The research focused on transforming different governance models among transit agencies in response to addressing the challenges in responding to travel demand, service coordination, and funding shortfalls. While multiple coordination is not discussed, five approaches to different governance models to support regional, coordinated services includes:</p> <ul style="list-style-type: none"> ▪ Expansion of transit service boundaries by statutory change; ▪ Expansion of transit service boundaries by agreement; ▪ Coordination or consolidation of multiple transit providers by statute; ▪ Coordination of multimodal transit providers by agreement; and ▪ Expansion of transit services to a larger regional and coordination of agencies, by creation of an “overlay” transit district. 	
KEY FINDINGS	
<p>The study concentrated on identifying effective regional organizational models; however, the researchers found that models are not directly nor easily transferrable. Instead, seven strategies for successful organization transformation for public transportation were identified:</p> <ol style="list-style-type: none"> 1. Every region is unique and precise governance choices for public transportation must fit the region; 2. It is important to recognize and capitalize on windows of opportunity for governance change; 3. Governance and financing for public transportation are so closely inter-related, they must be addressed together; 4. Governance change takes time and is never static; 5. Leadership and champions are critical to change in public transportation governance; 6. Advocacy groups and individuals can be extremely helpful; and 7. Good working relationships with other public agencies are critical to successful organizational transformation in public transportation. 	

PUBLICATION TITLE	
Reinventing the Urban Interstate: A New Paradigm for Multimodal Corridors	
AUTHOR	YEAR
Transit Cooperative Research Program	2011
LOCATIONS	AGENCIES
Nationwide	Multiple
MULTIMODAL PROJECTS COVERED	
<p>This research focused on multimodal corridors, focusing on the combination of multimodal facilities, land uses, and institutional arrangements. In general, the projects included in this study are parallel freeway and high capacity transit lines with supporting transit facilities, such as a station. Twenty multimodal case studies from across the country were presented and analyzed for this research.</p>	
MULTIMODAL COORDINATION COVERED	
<p>The publication recognizes that complex collaboration among organizations and agencies is needed for successful multimodal corridors due to the projects crossing jurisdictional boundaries and involving multiple mode-specific agencies. Some key coordination approaches from the research include</p> <ul style="list-style-type: none"> ▪ Well-defined and appropriate set of roles for each party; ▪ Project plan that serves the interests and needs of each stakeholder; ▪ Active and enthusiastic participation of all stakeholders; and ▪ Open collaborative process allowing all stakeholders a sense of empowerment. <p>The research also summarized each agency's strengths that could improve project coordination, as listed below. It also noted that agencies' roles should be assigned based on each agency's strength, to give a sense of empowerment to the decision-making.</p> <ul style="list-style-type: none"> ▪ U.S. DOT: Arbitrator of conflicts between partners and modal interests and funding agency for capital-intensive transportation projects. ▪ State DOTs: History of partnering with Federal government and can play a role in bridging the gap between highway and transit advocates when securing political support. ▪ MPOs: In control of regional transportation funds. The agency was also established a multimodal mandate, making them an ideal lead. ▪ Local Governments: Direct conduit to local political leaders and constituencies and ability to coordinate transportation investments with local land use controls. 	
KEY FINDINGS	
<p>The publication focused on the paradigm shift towards multimodal corridors, including the goals, purpose, and approach for implementing successful projects. The overall goals that are emphasized in the new paradigm are:</p> <ul style="list-style-type: none"> ▪ Enhancing corridor transportation capacity and performance through adding and operating transit lines without adding freeway capacity. ▪ Building and operating successful transit systems in multimodal corridors that attract high transit ridership and encourage livability and environmental sustainability. ▪ Transforming a corridor's land uses and activities to a more transit-oriented pattern. <p>Overall, these transit projects should not directly compete with freeway traffic or as a congestion reliever service; instead, multimodal corridors provide market segmentation between transit and freeway travel.</p>	

PUBLICATION TITLE

Evaluation of Automated Vehicle Technology for Transit – 2016 Update

AUTHOR**YEAR**

National Center for Transit Research

2016

LOCATIONS**AGENCIES**

Europe and America

Various

MULTIMODAL PROJECTS COVERED

This report summarizes the automated shuttle projects from around the world. Some demonstration projects, along with their location and description, include:

- **CityMobil2:** Europe. Focusing on developing design guidelines, understanding interaction between automated vehicles and roadway users, investigating legal framework, and development technical specifications. Large scale demonstrations included:
 - La Rochelle, France: Linked tourist locations, railway station, University, and city center;
 - Lausanne, Switzerland: Served as last-mile connector between university and metro station; and
 - Trikala, Greece: Linked historic city center with central business district.
 - **WEPod:** Netherlands. Similar to CityMobil, operated in university campus.
 - **CarPostal:** Switzerland. A public transportation company which plans to operate shuttles in old town and tourist center areas.
 - **GoMentum Station, Contra Costa Transportation Authority:** California. Public-private research facility to test autonomous, connected vehicle technology.
-

MULTIMODAL COORDINATION COVERED

While specific coordination was not discussed in this report, each demonstration required autonomous vehicle agency satisfaction of extensive country/state laws, rules, and regulations. Currently, the level of the approval process varies between states and countries, some with more flexibility than others.

KEY FINDINGS

The report summarized the current use of autonomous public transportation vehicles, which are primarily being used as shuttles within city centers or university campuses. All of the projects are still in testing and demonstration mode, using small scale implementation to determine improvements required for full scale deployment. This approach will ensure the operation of these vehicles runs smoothly, safely, and efficiently.

Many of the demonstration projects are being used to connect specific destinations or serve as first-/last-mile connectors. These tests also suggest the technology is scalable to use on large campuses, within city centers, or along corridors, and further support multimodal transportation. While the report does not discuss how autonomous vehicles will be used by agencies in the future, these tests could pave the way for introducing autonomous vehicles into the fleet, serving as support for current transportation hubs and destinations.

Literature Review Summary

Most of the reviewed literature pointed to “intangibles” required to support coordinated multimodal planning versus relying on specific project types associated with successful outcomes. In addition to the topics proposed in the introduction at least two other areas – integrated land use/transportation planning and transit expansion – emerged from our research. We found the latter to be a result of mature planning processes already in place and the majority of exemplary multimodal projects to be paired with major highway investments in larger urban jurisdictions. These lessons may be transferable to small urban and rural areas; however, the lack of examples found suggest more research is needed to highlight any best practice – which is a goal of this research.

Additionally, each multimodal project originated from a variety of needs, studies, research, and leadership. Transit projects paired with highway investments originated from transit needs spearheading the investment, transit solutions augmenting expanded highway throughput or both. The exact basis for proposing multimodal solutions varied depending on transportation need (e.g., model outputs, population projections), political climate (e.g., highway opposition), and/or relationships between local agencies.

Key Findings – Coordination Approaches and Common Themes

Coordination (from Federal agency involvement through local community support) is a key theme found throughout the reviewed literature. The mechanics and aspects of coordination vary, and depend upon project size, area, staff/stakeholders involved, and leadership within organizations to spearhead the project. Various DOT divisions, regional transit authorities, and local planning organizations provided expertise and a decision-making structure to make these multimodal projects successful. However, within this variety our **review discovered four findings** common to all successful project planning, development, implementation, and multiagency coordination:

- **Shared Vision and Goals:** Develop a method to establish and share common vision and goals, allowing a connection between planning and operations across departments and agencies and supporting open communication and cooperation. The shared vision can also support an organizational culture shifting focus from automobile and highway improvements to investments towards alternative modes of transportation.
- **Consolidated Operations and Organization:** Organize intra-agency departments to maximize efficiency and support multimodal discussion and collaboration. Support by strong leadership at all levels of government can further improve collaboration and coordination within an agency.
- **Shared Data and Information:** Ensure staff have adequate data, analysis, and decision-making tools across multiple modes and departments. Shared data can also monitor performance measures and support solutions and initiatives that require cooperation from multiple departments and agencies.
- **Dedicated Funding Source:** A lack of flexible funding across modes was identified as a major barrier for multiple coordination and projects. Finding or developing a sustainable and committed funding source for operations, maintenance, and capital projects can streamline the process and make them more viable.

In addition to these four frequent findings, the literature summarized other key topics and initiatives to help support successful coordination for multimodal planning and projects, including:

- Supporting opportunities for collaboration among a wide variety of documents, studies and projects;
- Gauging the political climate and governance, which could support or discourage multimodal projects;
- Considering unique contracting practices, such as a design-build approach, to shorten project construction and planning;

- Maintaining communication and supporting activities and initiatives involving the community and stakeholders;
- Finding a specific person or organization to serve as the leader of the effort and spearhead the initiative;
- Using momentum from previously successful multimodal projects for other initiatives; and
- Establishing supportive policies and legislation.

In some parts of the country, multimodal planning and coordination are new concepts, especially as transportation investments shift from traditional, highway capacity projects. Understanding these distinguishing features, examples, and lessons from past multimodal projects can help guide transportation officials and organizations when developing their own multimodal project.

APPENDICES

Appendix B: Flyer

NCHRP PROJECT 20-65, TASK 67, BEST PRACTICES FOR COORDINATION TO PLAN & IMPLEMENT MULTIMODAL PROJECTS

THE NEED FOR BETTER COORDINATION

As agencies, the public, and other stakeholders align on what constitutes the most effective transportation solutions for their region, these solutions are increasingly multimodal in nature. State departments of transportation (DOT) and their agency partners face many challenges to effective coordination as they plan, program, finance, and deliver multimodal projects. This problem is in part due to the historical siloed nature of multimodal planning, the number of partners involved, and the technical complexity of such projects. These factors raise the importance of coordination.

Other key challenges to coordination include insufficient funding; the need to compromise to stay on schedule and have a good project, if not 'perfect' in the mind of each stakeholder; managing relationships and establishing trust; addressing legalities of coordination; and complying with conflicting state, Federal Highway Administration (FHWA), and Federal Transit Administration (FTA) requirements.



The American Association of State Highway and Transportation Officials (AASHTO) Standing Committees on Planning, Environment and Public Transportation identified the need for a synthesis on the practice of multimodal coordination across State DOT, metro-politan planning organizations (MPO), and regional transit agencies. This flyer presents highlights of the synthesis that includes examples of successful coordination between highway and transit improvements (such as in a major corridor) and in the role of state DOT's delivering or assisting in the delivery of multimodal transportation solutions. The objective of this research, informed largely by case study interviews, was to examine, document, and communicate successful coordination strategies and tools that can be duplicated in a variety of contexts and situations and that promote solutions that benefit the multiple stakeholders involved.

CASE STUDIES – LESSONS LEARNED

Meeting In-Person Still Matters in the Digital Age

In-person meetings are critical, as the relationships that are developed are the backbone to successful project planning and delivery.

All case study participants underscored the value of in-person meetings, as relationship development is key to trust, compromise, and proactive coordination to address challenges. The Maryland Department of Transportation – Maryland Transit Administration (MDOT-MTA) communicated that frequent in-person meetings and early coordination – at the staff and manager/executive level – were essential to success of the BaltimoreLink project. They found this face-to-face time invaluable and committed to biweekly meetings with The Secretary's Office (TSO) and MTA leadership throughout the duration of the project. This included the MDOT Secretary of Transportation, Office of Planning and Capital Programming, Office of Public Affairs, and Office of Real Estate and the MTA Administrator and Chief Operating Office. The MTA Director of Planning provided an update to this group, who in turn discussed key issues and concerns.

The MDOT-MTA practiced coordination approaches that went beyond traditional meetings. They conducted several large, day-long workshops for all agencies involved in the BaltimoreLink project. The workshops' purpose was to bring all working groups and organizations 'up to speed,' with each topical focus group presenting the progress of subprojects and plans. The workshops provided a chance to ensure that everyone had access to all planning and construction updates and that plans and project components aligned.

The MTA employed strategies to ensure the workshops were interactive and to guarantee that each group could gather ideas from all partners to align and improve the Plan. These workshops were modeled after a strategic planning concept, to break down silos and bring everyone up to the same level of knowledge across the project as a whole. Similarly the City of Eugene, Oregon, and Lane Transit District (LTD) staff that implementing the Moving Ahead Bus Rapid Transit project have found in-person and weekly meetings critical to developing relationships and discussing regional priorities and projects.

Be Flexible and Ready to Adapt

Flexibility, adaptability, and collaboration are critical to coordination for multimodal projects.

Participating agencies for multimodal projects found flexibility and adaptability as vital to support project progress and evolution. This included adapting to changing roles – in some cases ceding a lead role (during a particular phase) to another agency in order to achieve broader, comprehensive results. For example, during the latter stages of the South Capitol Rail Runner Station project the Mid-Region Council of Government (MRCOG) took on a lead coordination role allowing it to operate with fewer restrictions than the project lead (New Mexico Department of Transportation (NMDOT)). This streamlined and enhanced the completion of the public outreach process.

Collaboration is not simply information sharing but also wisely drawing upon the strengths of each individual agency and expertise from the ground up to navigate complex project issues and foster solutions together. Understanding past agency coordination history, including a review of project development and implementation, can help avoid previous pitfalls and generate new approaches. The collaboration could be formalized through memorandum of understanding for all project components or remain an informal commitment built on mutual trust to overcome communication



barriers, external pressures, and stick together through project completion. The Clifton Boulevard Transportation Enhancement Project brought together communities who at first had competing aspirations for the corridor. However, the process of working through a respected party (Greater Cleveland Regional Transit Authority) and openly discussing differences led to success and trust in partnering on shared responsibilities. Coordination and collaboration can be daunting, especially if parties must first work through past broken history, however these case studies prove the up front time/energy invested to determine how to work together translates into future project success and effective use of funds.

In Washington State, the Department of Transportation (WSDOT) undertook Practical Solutions, an approach that is best described as a collection of programs to advance performance-based (versus standards-based) transportation solutions. WSDOT's move to this approach is augmented by recent Washington State legislation and the Secretary's Executive Order (E1090.00) which enables and encourages a more holistic, cross modal, and cross disciplinary approach to strengthen community engagement and agency credibility. WSDOT's Secretary cites Practical Solutions as a key agency focus area – often referring to its early results as a way to promote and advocate change.

Aligning Goals

Align the multimodal project with the existing planning process whenever possible; define common goals for the project, and demonstrate how the project will support regional goals.

When agencies are 'on the same page' project coordination is smoother. This is especially true for coordinating multimodal projects between state DOT and local agencies as the project should be developed to support mutual goals. Taking this action can help project staff see the value of the various aspects of the project and allow them to overcome challenges together. The linkage to regional goals is critical for building broader communication with



the executive level, external stakeholders, and public. While this theme of aligning goals was common across case studies, the MovingAhead BRT project in Eugene, Oregon provides a clear demonstration of this concept. The City of Eugene and Lane Transit District leveraged the lessons learned from the Emerald Express (EmX) implementation to develop the MovingAhead BRT project, a collaborative project working with the community and stakeholders to prioritize corridors for near-term transit, bicycle, and pedestrian infrastructure enhancements. In the past, these project types were implemented independently, rather than in a coordinated fashion. A key value of the MovingAhead BRT project is the coordination of transit and future land use assumptions. Another purpose of the project is to make clear how transit projects support regional economic, quality of life, and mobility goals, building from and implementing the local range plans, Envision Eugene, and LTD's Long Range Transit Plan.

To view a Quick Reference Guide, a presentation on project findings, and the Final Summary Report for NCHRP 20-65, Task 67, please visit: <http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4156>

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APPENDICES

Appendix C: Quick Reference Guide



QUICK REFERENCE GUIDE

BEST PRACTICES FOR COORDINATION TO PLAN & IMPLEMENT MULTIMODAL PROJECTS

A Summary of Lessons Learned and Brief Case Studies

- *MovingAhead Bus Rapid Transit Project, Eugene OR and Lane Transit District*
- *BaltimoreLink, Baltimore, Maryland*
- *Clifton Boulevard Transportation Enhancement Project, Cleveland, Ohio*
- *Washington State DOT I-5 Transit Bypass Project (Bus on Shoulders)*
- *South Capitol Rail Runner Station*
- *Integrated Corridor Management, US-75, Dallas Region*

About this Project

The purpose of research conducted for National Cooperative Highway Research Program (NCHRP) 20-65, Task 67 was to synthesize the practice of multimodal coordination across state Departments of Transportation (DOTs), metropolitan planning organizations (MPOs), and regional transit agencies. This synthesis highlights examples of successful agency coordination to implement multimodal projects (and in some cases multimodal practices) that include both roadway and transit improvements. This project also considered the role of state DOT's in delivering or assisting in the delivery of multimodal transportation solutions.

Cambridge Systematics conducted more than a dozen preliminary investigative interviews and five panel interviews to inform the research and to prepare a total of six case studies regarding the context, coordination, and outcomes that define these multimodal projects. The panel participants included key coordination partners such as DOTs, MPOs, transit agencies, and city transportation and public works departments.

The results of this research is the examination, documentation, and communication of successful coordination strategies, tools, and approaches for multimodal projects which can be duplicated in a variety of contexts and geographies to promote solutions that benefit multiple stakeholders. This project was managed by the NCHRP and overseen by the NCHRP Panel for Research, for the American Association of State Highway and Transportation Officials (AASHTO) Standing Committee on Public Transportation.

For more information about this project and to access other technical transfer documents, please visit:

<http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4156>

The time, experience, and expertise of many individuals contributed to the practical and timely conclusions of this research. The research team wishes to thank the NCHRP panel and case study sponsors across the country as this research could not have been possible without their investment.

OVERCOMING OBSTACLES


Transportation solutions involving multiple agencies, interests and goals requiring high degrees of effective coordination can expect (by their very nature) to face obstacles and project management challenges. The case studies profiled herein are no different – each tells a story (some of which are ongoing) of the need for all parties to buy into a common vision of project purpose and outcomes from the earliest stages of project conception. The high and visible commitment level of each agency brings about new levels of resource sharing and resourcefulness – staff in one agency discover staff in another who have data, tools, and capability to meet analysis needs, or the process leads to cross-training and educational opportunities that otherwise would not have existed. Funding is a big driver in the success of projects and a multi-agency coordinated approach can force staff to dig into the complexity of FHWA and FTA requirements and devise a funding strategy which leverages local, state, and federal dollars to advance the project. Project management is often the opposite of a hierarchical approach – rather, depending upon the stage of project development, one agency may cede control to another. This requires trust and confidence which is built from day one and strengthened as each agency reaffirms its commitment through various expected (and unexpected) obstacles. Finally, as in any negotiated process, a level of compromise to defer individual interests for the sake of meeting broader, more comprehensive goals is a hallmark of each case study and integral to its success.


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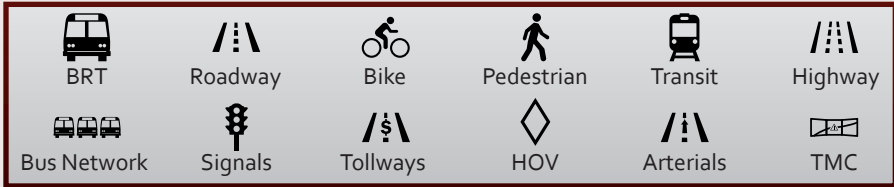
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How to Use this Document

This document includes a high-level summary of best practices for the coordination of multimodal projects and processes drawn from six case studies. Some of the case studies exemplify how state and local agencies found a common vision, leveraged resources and overcame challenges to jointly deliver a successful project. Other case studies focus on emerging processes within local and state agencies which involve transit and other modes to be part of a performance based solution.

Use the real world applications found in these practices to inform and guide the coordination challenges faced in your community to plan and implement multimodal projects. Share and discuss these strategies with current and future planning partners and jointly begin to identify the key coordination aspects, components, roles, tools, methods, and lessons learned to implement your next project.



Key Lessons Learned – Overview

MEETING IN-PERSON STILL MATTERS IN THE DIGITAL AGE

In-person meetings are critical, as the relationships that are developed are the backbone to successful project planning and delivery.

All case study participants underscored the value of in-person meetings, as relationship development is key to trust, compromise, and proactive coordination to address challenges. The Maryland Department of Transportation - Maryland Transit Administration (MDOT-MTA) communicated that frequent in-person meetings and early coordination – at the staff and manager/executive level – were essential to success of the BaltimoreLink project. They found this face-to-face time invaluable and committed to biweekly meetings with The Secretary’s Office (TSO) and MTA leadership throughout the duration of the project. This included the MDOT Secretary of Transportation, Office of Planning and Capital Programming, Office of Public Affairs, Office of Real Estate, the MTA Administrator, and Chief Operating Office. The MTA Director of Planning provided an update to this group, who in turn discussed key issues and concerns.

The MDOT-MTA practiced coordination approaches that went beyond traditional meetings. They conducted several large, day-long workshops for all agencies involved in the BaltimoreLink project. The workshops’ purpose was to bring all working groups and organizations “up to speed”, with each topical focus group presenting the progress of subprojects and plans. The workshops provided a chance to ensure that everyone had access to all planning and construction updates and that plans and project components aligned. The MTA employed strategies to ensure the workshops were interactive and to guarantee that each group could gather ideas from all partners to align and improve the Plan. These

workshops were modeled after a strategic planning concept, to break down silos and bring everyone up to the same level of knowledge across the project as a whole. Similarly the City of Eugene staff and Lane Transit District (LTD) staff in the MovingAhead BRT Project found in-person and weekly meetings critical to developing relationships and discussing regional priorities and projects.

BE FLEXIBLE AND READY TO ADAPT

Flexibility, adaptability, and collaboration are critical to coordination for multimodal projects.

Participating agencies for multimodal projects found flexibility and adaptability as vital to support project progress and evolution. This included adapting to changing roles – in some cases ceding a lead role (during a particular phase) to another agency in order to achieve broader, comprehensive results. For example, during the latter stages of the South Capitol Rail Runner Station project, the Mid-Region Council of Government (MRCOG) took on a lead coordination role allowing it to operate with fewer restrictions than the project lead (New Mexico Department of Transportation (NMDOT)). This streamlined and enhanced the completion of the public outreach process.

Collaboration is not simply information sharing but also wisely drawing upon the strengths of each individual agency and expertise from the ground up to navigate complex project issues and foster solutions together. Understanding past agency coordination history, including a review of project development and implementation, can help avoid previous pitfalls and generate new approaches. The collaboration could be formalized through a memorandum of understanding for all project components or remain an informal commitment built on mutual trust to overcome communication barriers and external pressures, and encourage partners to stick together through project completion.

The Clifton Boulevard Transportation Enhancement Project brought together communities who at first had competing aspirations for the corridor. However, the process of working through a respected party (Greater Cleveland Regional Transit Authority) and openly discussing differences led to success and trust in partnering on shared responsibilities. Coordination and collaboration can be daunting, especially if parties must first work through past broken history, these case studies prove the up front time/energy invested to determine how to work together translates into future project success and effective use of funds.

ALIGNING GOALS

Align the multimodal project with the existing planning process whenever possible; define common goals for the project and demonstrate how the project will support regional goals.

When agencies are “on the same page” project coordination is smoother. This is especially true for coordinating multimodal projects between state DOT and local agencies as the project should be developed to support mutual goals. Taking this action can help project staff see the value of the various aspects of the project and allow them to overcome challenges together. The linkage to regional goals is critical for building broader communication with the executive level, external stakeholders, and public.

While this theme of aligning goals was common across case studies, the MovingAhead BRT project in Eugene, Oregon provides a clear demonstration of this concept. The City of Eugene and Lane Transit District (LTD) leveraged the lessons learned from the implementation of the three initial corridors of the Emerald Express (EmX) Bus Rapid Transit system to develop the concept

for the project, a collaborative planning process used in the MovingAhead BRT Project. This BRT project involves working with the community and stakeholders to prioritize multiple corridors simultaneously for near-term transit, bicycle, and pedestrian infrastructure enhancements. In the past, these project types were implemented independently, rather than in a coordinated fashion. A key value of the project is the coordination of transit and future land use assumptions. Another purpose of the project is to make clear how transit projects support regional economic, quality of life, and mobility goals, building from and implementing the local range plans, Envision Eugene, and LTD’s Long Range Transit Plan.

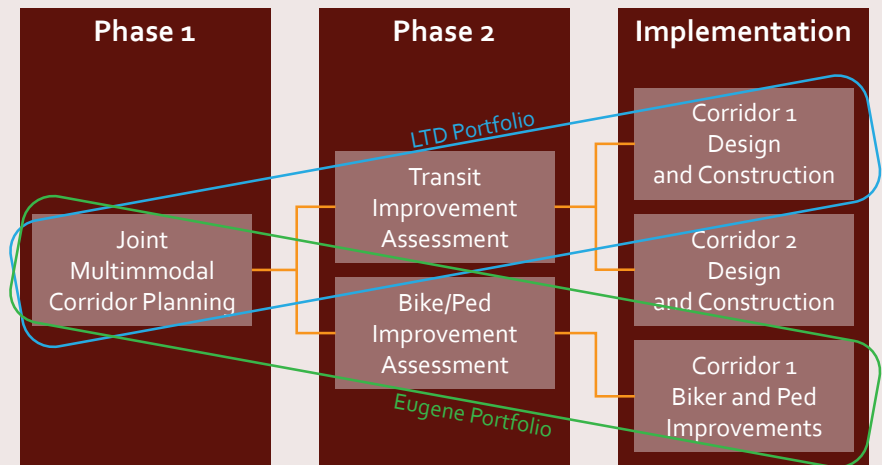


Key Lessons – Portfolio Management

The Project Management Institute (PMI) defines a portfolio as: “a collection of projects and/or programs and other work that are grouped together to facilitate the effective management of that work to meet strategic business objectives. The components (projects or programs) of a portfolio are quantifiable; that is, they can be measured, ranked, and prioritized.” In that context, the PMI goes on to define “portfolio management” as:

“the centralized management of one or more portfolios, which includes identifying, prioritizing, authorizing, managing, and controlling projects, programs, and other related work, to achieve specific strategic business objectives.”

This approach to managing projects has been applied by Tom Schwetz at LTD to transit projects as it aligns well with the process implementing partners undertake for project development. This is a phased approach to decision-making. The virtues of this approach are twofold. First, primarily from an internal standpoint, portfolios enable participants in planning and implementation to look more broadly at needs from a systems perspective. Rather than “siloeing” efforts to a single corridor, planners can take a systems development approach which enables them to consider the longer-term requirements (staffing, funding, and policy) of strategic objectives (for the City of Eugene and LTD, this includes areas such as building the regional BRT system, Eugene’s bike system, or Eugene’s compact corridor development approach). Second, from a partnering standpoint, partners can overlay their respective portfolios (similar to a Venn diagram) and get a clearer picture of where and how they need to work together. For the MovingAhead BRT project this overlay would indicate that the planning phase is clearly a shared responsibility.



Using this approach, partners start to understand the importance and specific nature of the collaboration. For example, in order for LTD to realize the development of its portfolio (in this case, development of the regional BRT system), LTD has to understand and incorporate the needs of the other transportation modes in the corridor – not just at the point where transit connects, but at the system level. In a similar fashion, the transit agency needs to understand and establish a more robust relationship with the process in planning for growth and development along the corridor. In that same vein, the City needs to have a similarly robust understanding of the transit system needs in the corridor. Robust community engagement needs to be integrated into all phases of the work.

“Beyond the immediate benefits of developing a portfolio perspective”, says Mr. Schwetz, “is the ability to understand and articulate more rigorously where we are going and what it is going to take to get us there, putting us in a position to more effectively seek funding and garner the support we need to deliver the vision.”

Key Concept – Practical Solutions

Practical Solutions is best described as a collection of programs to advance performance-based (versus standards-based) transportation solutions. Robust internal collaboration and a two-tier, decision-making structure is changing how staff across various divisions and program areas approach problem solving at Washington State Department of Transportation (WSDOT) and share in resource and cost-efficient improvements.

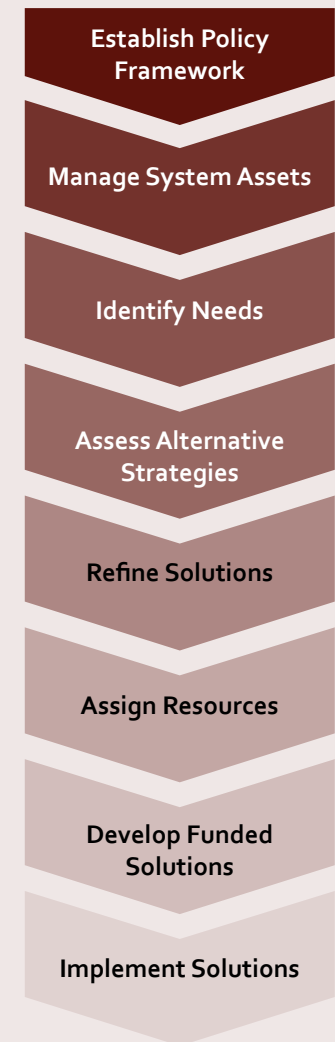
WSDOT's move to this approach is augmented by recent Washington State legislation and the Secretary's Executive Order (E1090.00) which enables and encourages a more holistic, cross modal, and cross disciplinary approach to strengthen community engagement and agency credibility. WSDOT's Secretary cites Practical Solutions as a key agency focus area – often referring to its early results as a way to promote and advocate change. Practical Solutions is not led by one particular division or department but advanced through initiatives and internal consensus to:

- Move to a performance-based approach to solving transportation needs;
- Use data, new tools, and best practices to preserve and maintain existing assets so that they last longer;
- Use more comprehensive tools and performance measures to support decision-making, rather than using limited data such as the volume of current traffic or safety history;
- Establish a multidisciplinary, multijurisdictional, multiagency approach to decision-making that considers more than just highways but looks at the entire transportation system of local roads and streets, arterials, transit services, bike and pedestrian facilities, and rail, air, and marine facilities;
- Enhances community engagement efforts to craft least-cost solutions within the context of land use;

- Considers operational and demand management strategies before high-cost capital projects are committed; and
- Implements low-cost solutions sooner, rather than waiting years for a high-cost project to be funded.

A common thread in this is the use of sustainable transportation practices to preserve the environment, promote transportation system efficiency, seek fiscally efficient solutions, improve and protect public health, conserve energy, and reduce greenhouse gases. The effort already has yielded changes to design manuals and technical guidance and prompted a cultural shift that is still evolving. Ongoing training and the role of two internal Practical Solutions groups (Roundtable and Working Group) is reinforcing the level of investment and seriousness of sustaining agency change.

Note: Practical Solutions is in an evolving stage of maturity and development and not defined by a single project but rather by a systematic approach whose outcomes are yet to be fully realized.



Case Study

MovingAhead Bus Rapid Transit Project



Lane Transit District (LTD) is the transit operator in Lane County, Oregon, primarily operating in the metropolitan areas of Eugene and Springfield. In addition to fixed bus routes and ADA service, LTD operates two bus rapid transit (BRT) lines, with a third set to open in fall of 2017. LTD started operating BRT, called Emerald Express (EmX), in 2007, connecting key destinations throughout the region. LTD, the Cities of Eugene and Springfield, the Lane Council of Governments, and the local community were involved in the implementation of these routes, building off of the State's support for multimodal projects since the mid-1990s.

Key Lessons Learned

Integrate regional multimodal transportation and land use planning.

A political project champion at varying levels of government is critical to success.

Conduct joint outreach to directly address local political concerns and reach all stakeholders.

Hold regularly scheduled in-person meetings for staff and/or stakeholders.

Coordinate the project from the ground-up, from planning to implementation.

After receiving significant resistance to previous BRT projects from stakeholders such as local businesses, LTD and the cities learned numerous lessons from implementation of the first EmX lines, including that transit projects need to be coordinated and supportive of larger regional planning efforts and coordinated with future land use. They also learned that having the City be a key lead in transit project implementation is beneficial, and that outreach to local businesses must be direct and targeted. The cities and LTD staff have learned that the system needs to be planned holistically, together, considering all modes. See the Portfolio Management concept



described on page 3 for an approach to holistic corridor planning. The lessons from EmX implementation led to the MovingAhead BRT project, a collaborative project of the City of Eugene and LTD to work with the community and stakeholders to prioritize corridors for near-term transit, bicycle, and pedestrian infrastructure enhancements. In the past, these project types were implemented independently, rather than in a coordinated fashion.

A key value of the project is the coordination of transit and future land use assumptions, providing mobility to corridors with the greatest growth in population and employment. Another purpose of the project is to make clear how transit projects support regional economic, quality of life, and mobility goals, building from and implementing the local plans, Envision Eugene, and LTD's Long Range Transit Plan. As of writing this document, the MovingAhead BRT project is underway.

Coordination Process and Tools	Outcome
Held a wide variety of internal meetings, including in-person, conference calls, and group workshops.	<ul style="list-style-type: none"> Ensured participants were included every step of the way, going from purely coordinating efforts to collaborating towards a solution.
Held a series of committees, commissions, and meetings with members ranging from local staff, public officials, residents, and business owners.	<ul style="list-style-type: none"> Provided a wide variety of viewpoints and ideas to the project team. Supported public outreach.
Created a MovingAhead Bus Rapid Transit project brand highlighting the joint partnership of LTD and City of Eugene.	<ul style="list-style-type: none"> Displayed the project supported a regional vision and was not the responsibility of only one agency.
Prepared to change expectations and adapt to situations.	<ul style="list-style-type: none"> Reduced delays due to unexpected issues. Supported the vision of a true collaborative process by being open to ideas and hearing alternative solutions.
Used an approach that had previously worked in other local agencies and departments.	<ul style="list-style-type: none"> Understood the process, perspective, and needs of other partners.
Acknowledged the current political climate and adjoining projects underway or under consideration.	<ul style="list-style-type: none"> Allowed the project to take appropriate actions to counteract negative effects.
Created a foundation for future projects, programs, and initiatives.	<ul style="list-style-type: none"> Represented good governance where agencies are stronger together, working towards a solution that satisfies the community's needs and wants. Supported more holistic solutions that improve safety. Provided the opportunity for LTD and City of Eugene to review project scopes and suggest enhancements. Created a Portfolio Management approach detailing how bicycle/pedestrian projects and operational improvements fit within an identified transit corridor.
Created multiple Intergovernmental Agreements.	<ul style="list-style-type: none"> Outlined the responsibility of each partner.
Established a protocol for file sharing and handling documents.	<ul style="list-style-type: none"> Created one place to share files. Ensured the latest documents are being used. Simplified the reviewing and editing process.

Role of the State DOT to assist in the delivery of multimodal transportation solutions

Be an intermodal champion – promote more transit-supportive engineering, design, and operations, including allowing BRT to operate on its own right-of-way.

ODOT is active in the project and a representative is available to talk on day-to-day basis.

Provide multimodal project funding. ODOT provided \$2 million for multiyear tiered NEPA process for Green Line and provided funding for the MovingAhead BRT project through a state grant.

Within the agencies, there has been a cultural shift over the last few years. LTD has changed from implementer of the BRT system to a collaborative partner in making multimodal improvements on major corridors (LTD has ownership in terms of NEPA and FTA expectations). This change seemed natural as it evolved over time, as the agency relinquished full project control it gained partnership in developing and implementing solutions. The City role included the identification of future projects and coordinating planning. Transit options are now more flexible and the transit plan focus is about what the route means for the community. There are a variety of service levels and treatment types to fit within a corridor, not just a one-size-fits-all BRT solution. The MPO helped implement the transit vision, represented broader communities for specific corridors, and participated in project management and documentation work. Also, the MPO has regional meetings every week, where participants not directly participating in committees can get project updates. This was a good place for different agencies to come together, develop relationships, and share information that helped lead to project implementation.

Case Study

BaltimoreLink



Maryland Transit Administration (MDOT-MTA) is the transit operator within the State of Maryland and is a Transportation Business Unit of the Maryland Department of Transportation (MDOT). The administration oversees a wide variety of transit services, operating local and commuter buses, light rail, metro subway, commuter trains, and paratransit services.

The project, supported by the Governor and Secretary of Transportation, addresses three overall improvement areas: service, infrastructure, and outreach. The change in service will enhance the current transit network by strengthening connections and mobility. To support the reliability and accessibility of this new service, MTA and the City of Baltimore installed various infrastructure improvements, including dedicated bus lanes, transit signal priority, transfer facilities, wayfinding signs and maps, and last mile connections through bike share, car share, and local transit operators. The outreach component included gathering feedback to draft plans, and also included working closely with the

Key Lessons Learned:

- Develop a realistic timeline.
- Encourage as much coordination as possible at all staff levels, in-person.
- Do not hesitate to change the norm.
- Break down barriers of miscommunication.
- Understand the perspectives of partner agencies and transit users.
- Be flexible.

community to communicate about changes in service, helping riders navigate the system, and gathering community feedback. BaltimoreLink launched in June 2017.

MDOT-MTA faced several challenges, including meeting a very short, self-imposed timeline and managing a project with a high level of complexity, the multifaceted project included the consideration of service, routes, and



transit-supportive infrastructure. The agencies also found legal proceedings for the transfer and use of funds were a significant obstacle. For BaltimoreLink, transferring funds required a legal memorandum of understanding (MOU); such proceedings can slow down project advancement. Most importantly, the agencies faced the challenge of achieving ambitious goals to improve reliability and reduce bus congestion downtown while also creating better regional connections.

Coordination Process and Tools	Outcome
Organized weekly/biweekly meetings with internal stakeholders.	<ul style="list-style-type: none"> Established trust between MTA and City of Baltimore. Created opportunity to address smaller, though important, projects that helped BaltimoreLink's success (e.g., replaced a parking lot with a bus loop).
Hosted three internal workshops.	<ul style="list-style-type: none"> Helped establish relationship between Baltimore City, MTA, and MDOT planners. Provided update on BaltimoreLink project while providing opportunity to talk openly about issues. Served to remove/bypass "silos" within organizations.
Used the past experience that employees had working in BaltimoreLink partner agencies.	<ul style="list-style-type: none"> Brought industry background on specific agencies. Built off of existing personal relationships and agency familiarity.
Supported by political project champion.	<ul style="list-style-type: none"> Briefed other political officials on progress. Gathered information on politically sensitive issues.
Coordinated the selection of consultant among partners (i.e., MTA and Baltimore City).	<ul style="list-style-type: none"> Ensured all parties would be comfortable and familiar with the consultant.
Coordinated permitting for capital improvements.	<ul style="list-style-type: none"> Built on previous relationship between MTA and the City of Baltimore. Offered solution in response to MTA not owning any property in Baltimore City. Supported goal of service and infrastructure improvements.
Used memorandum of understanding (MOU) as a formal agreement between MTA and Baltimore City.	<ul style="list-style-type: none"> Recommended creating individual MOUs for each project aspect (transit signal priority, bicycle lanes, bike share, etc.) to save time and make process easier.
Set up a file sharing system.	<ul style="list-style-type: none"> Used platform to organize public comments. Allowed easier file sharing between partners.

Coordination was necessary at every level of the agencies to ensure a successful project – coordination occurred at the executive level, management and technical levels. The project manager led an executive team meeting every two weeks, in-person. The project manager would update the team, which would then discuss key issues. For example, the timing of BaltimoreLink implementation was anticipated to occur at the same time as a fare increase – this was considered bad timing for presenting the new plan to the public and developing a positive public image. The leadership group was able to put forth the idea of providing for two weeks of free transit as the new system opened. As this idea would have revenue impacts, it was necessary for leadership, especially the Secretary, to

support this decision. Frequent in-person meetings allow for such conversations and timely solutions.

MTA also conducted several large, day-long workshops for all agencies involved in the BaltimoreLink project. The workshops' purpose was to bring all working groups and organizations "up to speed", presenting the progress of subprojects and plans. The workshops provided a chance to ensure everyone had access to all planning and construction updates, so that each focus group or agency could ensure all plans and project components align. The workshop employed strategies to ensure interactive participation and to guarantee each group could gather ideas from all partners to align and improve the Plan. These workshops were modeled after a strategic planning workshop – to break down silos, bring everyone up to the same level of knowledge.

Coordination of MDOT-MTA and the City also led to other positive outcomes for cost efficiency, project quality, and project schedule. For example, when designing and purchasing new signs, rather than the City and transit agency producing and installing separate signs, the City language for the signs "Tow-Away Zone" was added to the bus-only lane signs. Coordination allowed for better siting of transfer locations, the creation of a new bus loop on a city parking lot, and an accelerated permitting process.

Role of the State DOT to assist in the delivery of multimodal transportation solutions

Key coordination partner, active in addressing issues and solving overarching challenges.

MDOT coordinated a successful TIGER grant application (North Avenue Rising - \$27 million) with Baltimore City, which strengthened the relationship between the parties and provided project funding for a key transportation corridor.

Case Study

Clifton Boulevard Transportation Enhancement Project



The Clifton Boulevard Transportation Enhancement Project upgraded four miles of Clifton Boulevard, a key transportation corridor connecting the cities of Lakewood and Cleveland, Ohio. The project enhanced access for all transportation modes. As the section of Clifton Boulevard affected by the proposed project would travel through two jurisdictions, a significant amount of coordination was necessary to successfully complete the project. Beginning in 2007, the cities worked together to develop a conceptual plan.

The initial concept was to implement traffic calming measures and improve the landscaping, lighting, and transportation amenities. The project aligned with vision and goals established for the greater Cleveland region by providing enhanced access to additional travel modes, environmental and economic development, and other benefits. These regional benefits were key factors driving wide support for the project. In 2009, The Greater Cleveland Regional Transit Authority (RTA) applied for and received Federal stimulus funds to design

the Clifton Boulevard Transportation Enhancement Project.

The cities started with two different visions and outcomes for this corridor but ultimately found common ground to advance the project. This was a defining aspect of overcoming a potential obstacle and building project momentum and trust – which ultimately led to an increased degree of staff interaction, resource sharing, and coordinated stakeholder engagement.

The cities investigated how to make the wide streets better accommodate transit, alleviate congestion, and address safety issues, especially for bicyclists and pedestrians. The findings led to the development of a BRT line along the corridor that included a variety of enhancements such as new, branded buses, rebuilt streets and sidewalks, and new bus shelters. The BRT service was named the Cleveland State Line and opened in December 2014.

The RTA was the lead agency for the project. Additional agencies with significant involvement include the City of Cleveland, City of Lakewood, Northeast Ohio Areawide Coordinating Agency (NOACA), and Cleveland State University. The agencies involved in planning and implementing the Clifton Boulevard project have identified key lessons learned that can be applied to coordination for similar projects in other metropolitan areas. In particular those lessons included that

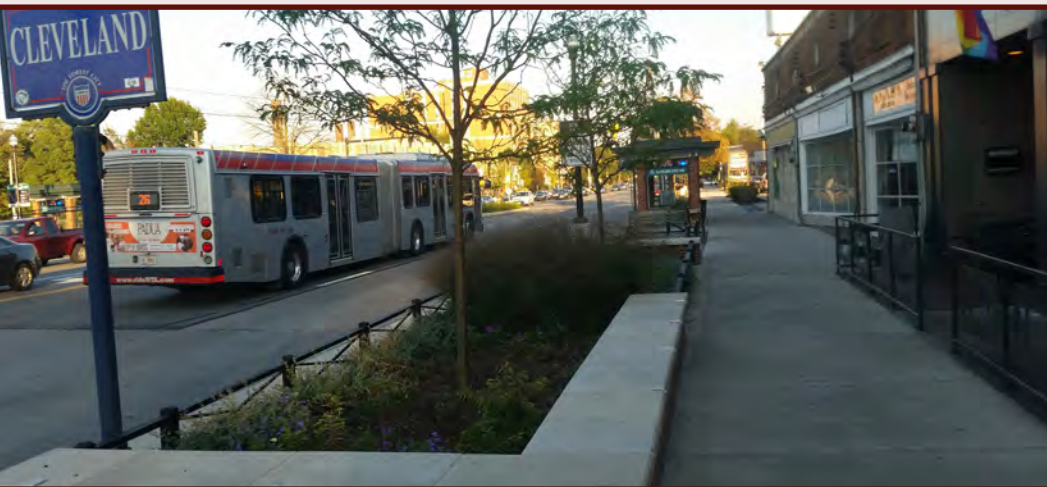
Key Lessons Learned

Align project goals with regional goals.

Create a funding package from a variety of sources.

Provide ample opportunities for input from stakeholders.

Enable the project champion to lead coordination efforts.



project coordination benefits from having a project champion that is skilled in leading the coordination effort, establishing project goals that align with regional goals, creating a funding package from a variety of sources, and providing ample opportunities for input from stakeholders.

Skillful coordination by project champion, RTA, led to bringing together two adjacent cities with little previous success in coordinating. This coordination included engaging state and local officials. This coordination utilized an informal agreement process with agencies to ensure flexibility and adaptation in the process could be embraced by all coordinating parties, as necessary. RTA commonly developed informal memorandums of agreement (MOUs), which worked well. Some MOUs were lengthier (up to 40 pages). Over time, the agencies moved to simpler MOUs. This agreement among jurisdictions provided a unified voice in the NOACA planning process, which helped the project receive additional funding and support; and enabled agencies to continue to work together when obstacles arose (e.g., change in elected leaders) to maintain momentum and complete the project on time and on budget.

Coordination Process and Tools	Outcome
Implemented a proactive project-management approach throughout implementation.	<ul style="list-style-type: none"> Improved communication about timelines and schedules, including about impacts at the individual street level, to better manage disruptions. Limited the negative impacts of project construction on public and businesses.
Used robust public involvement throughout the project, including creating a web site, blog, and Civic Advisory Committee and holding meetings with neighborhood groups.	<ul style="list-style-type: none"> Encouraged stakeholders to submit questions and comments and provided contact information for project leads. Received a wide variety of viewpoints and ideas during environmental, planning, design, and construction processes. Obtained agreement on possibly contentious issues, such as bus stops maintaining architectural integrity in the corridor and residential concerns with bus stop placement. Tailored project to communities by engaging artists to design signage along the corridor. Reduced conflicts and delays during implementation.
Placed emphasis on the alignment of project goals with vision and goals established for the region.	<ul style="list-style-type: none"> Confirmed project supported transit-oriented commercial and residential growth, enhanced access for all modes, environmental benefits, and reduced congestion. Helped position project as implementation of existing plans. Built support to provide funding for the project and increased commitment from agencies.
Assembled a creative funding package from multiple sources and agencies.	<ul style="list-style-type: none"> Provided funding through a combination of programs and sources, including U.S. DOT, Ohio DOT, RTA, NOACA, City of Cleveland, and City of Lakewood.
Communicated the status of funding inquiries and responses.	<ul style="list-style-type: none"> Supported creative thought around funding. Encouraged partners to wait collectively for the financial picture to emerge.

Role of the State DOT to assist in the delivery of multimodal transportation solutions

Helped creatively find and finance part of the corridor improvement.

Provided valuable support role addressing questions on use and requirements of state funds, and design standards, and committed to the project early on.

Case Study

Washington State DOT I-5 Transit Bypass Project (Bus on Shoulder)



The Interstate 5 (I-5) Transit Bypass Project was conceived as a means to address increasing levels of congestion on I-5 between Seattle and the City of Everett, which lies approximately 25 miles to the north. Increased economic and residential growth had resulted in significantly greater travel demand along this corridor. In recent years, HOV travel times had increased by almost 20 minutes, and the HOV lanes were performing substantially below travel speed standards. Transit reliability also was decreasing, with more than 25 percent of bus trips arriving late. Buses were overcrowded, with a significant number of people standing for trips of 65 minutes or more. Park-and-ride facilities that serve as a key access points for transit on the corridor were chronically overcrowded. The worsening traffic conditions were compounded by the fact that no one agency was responsible to address the central issues – and no financing support was offered by the State Legislature to resource and target or expand pipeline projects which solved the problem.

Key Lessons Learned:

Think outside of the box and consider unorthodox approaches.

Identify ways to optimize the system and make best use of existing highway capacity.

Have a strong project champion that is willing to lead the coordination effort.

Identify an evaluation plan to monitor, measure, and report on success.

To address these issues, Washington State Department of Transportation (WSDOT) and Community Transit initiated a multiagency assessment to develop a near-term (one- to four-year) action plan to improve transit performance in the corridor. A one-day workshop was held in March 2015 to jump start this effort. At the workshop, a small group of agency experts brainstormed and assessed options and developed a list of feasible improvements. A work team comprised of key staff from Community Transit,

WSDOT, First Transit, and Spokane Transit developed a list of potential transit bypass locations and other possible actions at the workshop. They then began to engage other agencies and form an informal coalition to pursue improvements. WSDOT and Community Transit developed a proposal to test the use of freeway shoulders as transit bypass lanes during heavy traffic congestion on southbound I-5.

The effort resulted in a plan to implement the solution. Through additional study, the group discovered that some drainage basins along the shoulders needed to be reinforced to handle the additional load of buses. The agencies then set out to secure additional funding to reinforce the basins.

Community Transit was the lead agency for the project and WSDOT was a primary partner, not only in provision of funding but also in leading concept development and coordination. Additional agencies with significant involvement include Puget Sound Regional Council (PSRC), Sound Transit, FHWA, Washington State Patrol, and Spokane Transit (who acted as impartial, independent experts). The PSRC was a very supportive partner that offered tools, facilitation, and planning resources to move the project forward. PSRC facilitated conversation between agencies, provided data analysis of travel on the corridor, and briefed the board.



The agencies involved in planning and implementing the I-5 Transit Bypass project have identified key lessons learned that can be applied to coordination for similar projects in other metropolitan areas. In particular, those lessons include think outside of the box and consider unorthodox approaches; identify ways to optimize the system and make the best use of existing highway capacity; have a strong project champion that is willing to lead the coordination effort; and identify an evaluation plan to monitor, measure, and report on success.

Coordination Process and Tools	Outcome
Used a one-day intensive brainstorm approach to identify impactful and cost-effective solutions.	<ul style="list-style-type: none"> • Focused on logical, low-cost, and practical solutions that would incrementally improve performance on the corridor.
Selected participants across agencies who could work together to achieve success, considering the technical expertise and knowledge that would be needed.	<ul style="list-style-type: none"> • Improved project planning and implementation resulted from having a group that was willing to work together, open to flexible approaches, and able to focus on producing a deliverable.
Demonstrated a willingness to pool resources, commit to a joint solution, and communicate regularly.	<ul style="list-style-type: none"> • Enabled addressing of project challenges with appropriate expertise, a mixture of day-to-day operations and long-range planning – the project was not in the wheelhouse of a single resource.
Implemented proactive and continual coordination and communication approaches.	<ul style="list-style-type: none"> • Embraced regular phone calls and face-to-face meetings to maintain communication and coordination. • Created a sense of shared ownership for the project, allowing team work and trust across agencies. • Allowed agency leadership for project elements to be assigned based on expertise or areas of responsibility. • Developed working groups when needed to address issues.
Utilized data to tell a story about corridor conditions and emphasize project need.	<ul style="list-style-type: none"> • Removed data silos to enable analytics and tell the story. • Used multiple travel data sources from the corridor. • Demonstrated project effectiveness via actual data instead of forecasts (e.g., increased frequency of “worst” days in the corridor). • Developed plan to measure and monitor the project results.
Created operating rules and agreements with multiple agencies as needed.	<ul style="list-style-type: none"> • Formal operating rules for shoulder of the roadway use were created by FHWA, WSDOT, and Community Transit. • Other agreements were informal and evolved as needed.

Role of the State DOT to assist in the delivery of multimodal transportation solutions

Initiated a multiagency assessment to improve transit performance in the corridor.

Coordinated with transit agency to initiate effort through a workshop.

Encouraged and supported unorthodox approaches.

Case Study

South Capitol Rail Runner Station



The South Capitol Rail Runner Station is a station in Santa Fe serving New Mexico's Rail Runner Express commuter rail, which connects the metropolitan areas of Santa Fe and Albuquerque. Rail Runner mostly parallels Interstate 25 and began its phase one operation in 2006. The second phase, an extension to Santa Fe, opened in late 2009.

In August 2003 then Governor Bill Richardson announced the State would pursue the implementation of commuter rail in this corridor. In September 2003, the State Legislature passed a \$1.6 billion transportation improvement package that included implementation of this service. In February 2008 work began on site plans and design work for the South Capitol station.

The station includes a park-and-ride lot along with connections to a variety of bus services by multiple providers, including Santa Fe Trails, Santa Fe Pickup, NMDOT Park and Ride, and North Central Regional Transit District (NCRTD). The two-sided



Key Lessons Learned

If possible, identify and encourage a strong project champion at the highest level of government in the state, as political support can be highly beneficial to project implementation.

Take steps to ensure ownership and interest in the success of the project.

Provide ample opportunities for public involvement from citizens and stakeholders, including planning and design input on station locations and connection to trails.

Hold frequent in-person meetings with key agencies throughout project planning and implementation.

platform is a major stop for business commuters and those making bus connections to other locations in and around Santa Fe. The ownership of multiple transportation assets which were leveraged for this project also necessitated the need to overcome a complex level of coordination to reduce modal conflict points and accommodate multiple modal trips as appropriate. The State Government complex and other development (such as the construction of higher density style lofts) changed foot traffic, land use patterns, and economic vibrancy in the area. This commuter-oriented pattern represent a notable departure from typical density in Santa Fe.

The development of service in this corridor required concurrent and well-timed and coordinated efforts on many fronts. In addition to the agencies listed, Rio Metro Regional Transit District, City of Santa Fe, Santa Fe MPO, and MRCOG were directly involved. Commuter rail was a high priority of the Governor and there was strong support from the Chamber of Commerce and the tourism industry. Funding was largely in place for planning and construction, and the existing infrastructure and geography provided ideal conditions for the project. Furthermore, there was a lack of opposition that some multimodal projects can commonly face.

The agencies involved in planning and implementing the South Capitol Station have identified key lessons learned that can be applied to coordination for similar projects in other metropolitan areas, particularly small urban areas on the edge of rural locations. In particular, those lessons include having a strong project champion, successfully coordinating across multiple agencies, including ample opportunities for public involvement, and holding frequent in-person meetings with key agencies.

Coordination Process and Tools	Outcome
Held hundreds of in-person meetings to incorporate stakeholder and public input.	<ul style="list-style-type: none"> Facilitated coordination of fare structures between Rail Runner and bus service. Maintained updates to the governing boards of jurisdictions along the line and at meetings of civic, religious, and neighborhood association groups. Allowed the project team to receive a wide variety of viewpoints and ideas.
Worked with a wide cross-section of agency staff and disciplines in project planning, design, and implementation.	<ul style="list-style-type: none"> Emphasized project benefits from the beginning, allowing agencies to understand the objectives and work towards completion within the ambitious timeline. Avoided contentious issues. Created a “problem-solving” mentality, drawing on cross-agency perspectives to address issues.
Implemented proactive coordination and communication methods to integrate modal services and schedules and update the public on progress.	<ul style="list-style-type: none"> Ensured a high level of coordination during planning and construction with information posted on the Internet including weekly web site updates during construction. Produced coordinated schedules between existing bus and shuttle service and Rail Runner.
Used existing planning processes to move the project forward within established timeframe.	<ul style="list-style-type: none"> Vetted station locations through the MPO process with policy board members actively weighing in on decisions.
Created a strong branding strategy for Rail Runner.	<ul style="list-style-type: none"> Created a distinctive, visible, and attractive identity for the commuter rail service and station. Allowed a common reference for involved agencies and acted as a symbol of the success, transformation of the service, and attractiveness of the area.
Developed tools specifically to analyze and visualize project options.	<ul style="list-style-type: none"> Built a combined travel demand model using Santa Fe and Albuquerque models. Developed eye-catching maps to convey information to decision.
Used an informal coordination process to leverage past relationships and ensure flexibility.	<ul style="list-style-type: none"> Allowed MRCOG to act primarily as an agent of NMDOT for various project needs, allowing for an accelerated process. Contributed to the sense that each agency worked primarily to their strengths.

Role of the State DOT to assist in the delivery of multimodal transportation solutions

Responding to the legislative and executive initiative and funding, MRCOG and NMDOT developed a strategy for implementing commuter rail in this corridor.

Leveraged a state asset (rail line) to provide an alternative solution within a suitable terrain and to the satisfaction of partners and stakeholders.

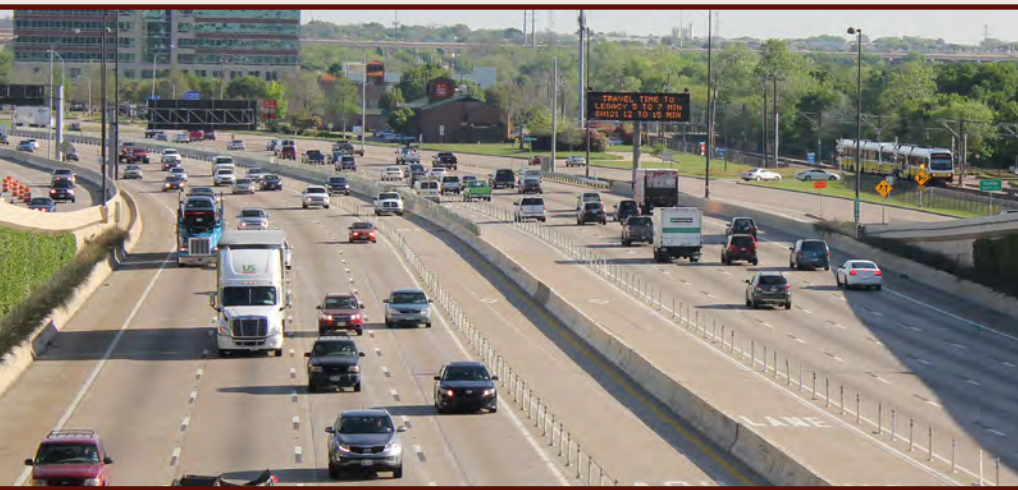
Case Study

Integrated Corridor Management, US-75, Dallas Region



Dallas Area Rapid Transit (DART) is the transit operator in Dallas, Texas and 12 surrounding cities, providing a wide range of services to over 200,000 passengers per day, including light rail, commuter rail, local bus, and paratransit service. DART first led the US-75 Integrated Corridor Management (ICM) project, a collaborative and cooperative project for improving service along the US-75 corridor; it is now led by TXDOT. The project is in collaboration with the City of Plano, City of Dallas, City of Richardson, North Central Texas Council (NCTCOG), Texas Department of Transportation (TxDOT), Texas Transportation Institute (TTI), and Southern Methodist University (SMU).

DART and partners began ICM development on in 2006, ICM became fully operational in 2013. The project purpose was to improve the flow of travel in the corridor by responding to events that impact flow, through real-time action, using planned responses that require multimodal and multi-jurisdictional coordination. The travel corridor includes DART's Light Rail Transit (LRT) and bus network, US-75, hundreds of signals, tollways, managed HOV lanes, numerous



Key Lessons Learned

Use data to make informed decisions. For ICM, data was used to develop the model and the 144 predeveloped response plans.

Use of a travel demand model can help to inform decisions, share information, and provide a forum that benefited from expertise of both engineers and planners.

Ensure involvement of all agencies who all have to approve of the selected ICM plan. For US-75, this requirement for real-time approval was key to getting all agencies agree to the ICM project.

Coordination aids in solving problems affecting ICM and making activities more streamlined; for US-75, the sharing of servers is an example.

Dedicate funding for a full-time ICM coordinator.

local arterials and multiple traffic management centers. The partners developed a cooperative management plan that included 144 possible events and planned responses that were developed through use of modeling. All partners reviewed and approved each response plan in advance to allow for quick action. The plans would be put into action in response to major highway incidents, weather events, or other nonrecurring congestion. When an event occurs, all the participating agencies must provide verbal approval of the response plan to allow it to be implemented, this step was required to have all agencies agree to the overall ICM plan. With real-time data and preset responses, DART could make real-time decisions regarding adding additional bus service or dispatching additional trains.

As the lead agency in planning and implementing US-75 ICM, DART leadership identified key lessons learned that can be applied for future coordination. The lessons included having strong leadership with financial resources and technical expertise, having full-time staff solely working on the project, strong communication between involved partners, and utilizing the travel demand model to support consensus agreement on the response plan.

DART communicated that if they were to begin again, the following lessons would be employed: obtain up front commitment to maintain a full time ICM coordinator even after the demonstration; update response plans and modeling as the highway network changes; apply more pressure to involve the toll agencies; require key upgrades of some City of Dallas key signals to permit more response plans to be implemented; require minimum staffing hours to support ICM; and determine a more accurate budget for operations at the beginning of the grant process.

Coordination Process and Tools	Outcome
<p>Involving multiple multimodal agencies and addressing key issues necessary for each agency to participate.</p> <p>Conducted monthly meetings.</p>	<ul style="list-style-type: none"> • Treated network as one cohesive system. • Transcended political and jurisdictional boundaries. • Kept all agencies informed. • Provided forum to discuss what worked or did not work and how to improve the project.
<p>Utilized a travel demand model and shared data and servers.</p>	<ul style="list-style-type: none"> • Provided a framework for sharing information that could be used by engineers and planners. • Produced results that allowed consensus agreement on response plans. • Allowed multiple agencies to assist with problem solving. • Concluded that updating the network over time with new and changing infrastructure would preserve the utility and longevity of the model, provided data and service on other related projects (video, incident response, ATMS).
<p>Developed a unique funding approach through multiple sources and agencies.</p>	<ul style="list-style-type: none"> • Allowed the project to proceed (but lacked an approach to long-term funding). • Created a situation that not all involved agencies contributed to funding – perceived as a negative by some project observers.
<p>Accepted that flexibility and compromise were required for implementation.</p>	<ul style="list-style-type: none"> • Promoted adoption of strategies that would be optimal for the regional network but might not be optimal for an individual agency or jurisdiction.
<p>Established a cooperative management plan that was reviewed and approved by all parties, but that still required real-time approval for selecting an ICM plan.</p>	<ul style="list-style-type: none"> • Facilitated getting all agencies to agree to project. • Allowed all agencies to be active and vested into the project and decision.

Role of the State DOT to assist in the delivery of multimodal transportation solutions

TXDOT supported the pilot project and matched partner funds. Role was first rather limited due to the project being a pilot test.

Transportation Systems Management (TSM) - the ICM system utilizes the existing TxDOT Center-to-Center standards based communication infrastructure, and provides direct connections to agencies not on the Center-to-Center network.

Consistent project management involved DART, TxDOT, Richardson, NCTCOG, Plano, and the City of Dallas (Operations Committee, Technology Committee).

The lead role of ICM Coordinator was transitioned to TxDOT as it has elected to convert the lanes into tolled Express lanes (HOV incentives are maintained).

Resources

Title
State-of-the-Practice for Advancing Planning and Operations Integration Opportunities within Transportation Agencies
Multimodal NEPA – Existing Procedural Challenges and How the FAST ACT Could Help
Best Practices in Project Delivery Management
Statewide Multimodal Planning: Current Practice at State DOTs
Advances In Strategies For Implementing Integrated Corridor Management (ICM)
Successful Intermodal Corridor Management Practices for Sustainable System Performance
Collaboration: The Key to Success in Transportation
Multimodal Needs, Constraints, and Opportunities: Observations and Lessons Learned For Georgia and GDOT
Evolving Role of Metropolitan Planning Organizations in Transportation Planning for Megaregions
Regional Organizational Models for Public Transportation Final Report
Reinventing the Urban Interstate: A New Paradigm for Multimodal Corridors

For more information on individual case studies:

MovingAhead Bus Rapid Transit Project: <http://www.movingahead.org/>

BaltimoreLink: <https://mta.maryland.gov/baltimorelink>

Clifton Boulevard Transportation Enhancement Project: <http://www.riderta.com/majorprojects/cliftonblvd>

Washington State DOT I-5 Transit Bypass Project (Bus on Shoulder): <https://www.communitytransit.org/>

South Capitol Rail Runner Station: <https://www.riometro.org/stations/south-capitol>

DART ICM, US-75: https://www.transit.dot.gov/sites/fta.dot.gov/files/FTA0082_Research_Report_Summary.pdf

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APPENDICES

Appendix D: Microsoft PowerPoint Slides

NCHRP Project 20-65, Task 67

Coordinated Multimodal Project Planning



7/19/2017

Agenda

- » Welcome and Introductions
- » Project Purpose
- » Research Approach
- » Research Findings
- » Key Challenges
- » Key Lessons
- » Technical Transfer Documents

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The agenda today includes the following:

- Welcome and Introductions
- Project Purpose
- Research Approach
- Research Findings
- Key Challenges
- Key Lessons
- Technical Transfer Documents

Ground Rules

- » If you have a question, please raise your hand, we will address questions during designated break points
- » If you need to step away, please do not press hold.
- » Please put yourself on mute
- » Thank you!

3

If this presentation is being provided by webinar, we suggest using this slide:

- If you have a question, please raise your hand, we will address questions during designated break points
- If you need to step away, please do not press hold.
- Please put yourself on mute
- Thank you!

Technology Transfer Documents

1. Final Report
2. Quick Reference Guide (20 pages)
3. Flyer (2 pages)
4. PowerPoint Presentation

- » User-Friendly Materials
- » Quickly glean research and key findings
- » Materials can be found on the project website:

<http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4156>



Today we'll provide an overview of the research and resulting products for NCHRP 20-65, Task 67. These include:

- Final Report
- Quick Reference Guide (20 pages)
- Flyer (2 pages)
- PowerPoint Presentation (This presentation)

Materials can be found on the project website:

<http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4156>

Research

» Purpose:

- **Synthesize** the practice of multimodal coordination across State DOT, MPOs, and Regional Transit Agencies
- **Highlight** examples of successful coordination between highway and transit improvements (such as in a major corridor) and in the role of State DOT project delivery of multimodal transportation solutions
- **Document** and communicate successful strategies which can be duplicated in a variety of contexts

5

State departments of transportation (DOT) and their agency partners face many challenges in planning, programming, financing, and delivering multimodal projects. This problem is in part due to the historical siloed nature of multimodal planning. It is also due to the complexity of such projects, the requirement for coordination of numerous transportation agencies and often multiple jurisdictions, and the alignment of such agencies, the public, and other stakeholders on what constitutes the most effective transportation solutions for their region.

The AASHTO Standing Committees on Planning, Environment and Public Transportation identified the need for a synthesis on the practice of multimodal coordination across State DOT, metropolitan planning organizations (MPO), and regional transit agencies. This synthesis will highlight examples of successful coordination between highway and transit improvements (such as in a major corridor) and in the role of State DOT's delivering or assisting in the delivery of multimodal transportation solutions. The objective of this research is to examine, document, and communicate successful strategies and efforts which can be duplicated in a variety of contexts and situations and which promote solutions that benefit the multiple stakeholders involved.

Research

» Approach:

- Conduct **Literature Review and Interviews**
 - › Investigate distinguishing features of multimodal transportation planning / coordination and identify areas of the country for case studies / research
- Research / Interview **Six Case Studies**
 - › Develop case studies which encapsulate successful models of coordination and project delivery for multimodal projects through panel interviews
- Prepare **Technical Assistance / Technical Transfer Documents**
 - › Synthesize findings from literature review, interviews, and case study panel interviews into various technology transfer documents, including a quick reference guide, one page flyer, and PowerPoint presentation
- Conduct **Webinars**
 - › Develop webinars to panel members, case study interviewees, and FHWA / FTA staff to present findings and gather feedback for the final documents
- **Finalized Technology Transfer Documents and Final Report**

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Task 1: Conduct Literature Review and Interviews

Conduct an extensive literature review and facilitate interviews to identify distinguishing features of multimodal transportation planning/coordination with strong transit solutions, identify and synthesize current FTA and FHWA guidance regarding multimodal transportation planning and project delivery and to identify four to five areas of the country for case studies/research.

Task 2: Research Five Areas of the Country for Case Studies

Under Task 1, five areas of the country that provide exemplary examples of multimodal coordination were identified. Task 2 will further research and develop case studies on those areas. Results of the case study analysis and research will be used to create the initial draft content for tech transfer products (outline and key messages) and will inform the products developed in Tasks 3, 4 and 5.

Task 3: Prepare Technical Assistance/Technology Transfer Documents

Based on the results of the literature review, interviews, case study panel interviews, and additional case study research, this task prepares materials that provide technical assistance and materials that transfer knowledge. These draft materials will be reviewed during Webinar #1 and presented as final in Webinar #2. They will be presented in Webinar #3, to initiate technical transfer to interested state DOTs, transit authorities, jurisdictions, and other interested parties. These materials will also be presented in the Final Report.

Task 4: Conduct Webinars

Conduct two webinars with the case study panel interviewees as well as FHWA and FTA staff to assist in developing effective outreach materials, as well as a public webinar to share the results of the study with all interested parties, including FTA and FHWA as well as interested state and regional transportation providers.

Task 5: Finalize Technology Transfer Documents and Prepare a Final Report

Prepare a final report that includes finalized technology transfer documents, webinar result summaries, and recommendations on Federal guidance.

Preliminary Findings – Characteristics of Successful Multimodal Projects

» Literature Review and Interviews

• Shared Vision and Goals:

- › Allow a connection between planning and operations across departments and agencies and supporting open communication and cooperation

• Consolidated Operations and Organization:

- › Organize intra-agency departments to maximize efficiency and support multimodal discussion and collaboration

• Shared Data and Information:

- › Ensure staff have adequate data, analysis, and decision-making tools across multiple modes and departments

• Dedicated Funding Source:

- › A lack of flexible funding across modes was identified as a major barrier for multiple coordination and projects

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The **literature review plus early interviews discovered four findings** common to all successful project planning, development, implementation and multi-agency coordination:

- **Shared Vision and Goals:** Develop a method to establish and share common vision and goals, allowing a connection between planning and operations across departments and agencies and supporting open communication and cooperation. The shared vision can also support an organizational culture shifting focus from automobile and highway improvements to investments towards alternative modes of transportation.
- **Consolidated Operations and Organization:** Organize intra-agency departments to maximize efficiency and support multimodal discussion and collaboration. Support by strong leadership at all levels of government can further improve collaboration and coordination within an agency.
- **Shared Data and Information:** Ensure staff have adequate data, analysis, and decision-making tools across multiple modes and departments. Shared data can also monitor performance measures and support solutions and initiatives that require cooperation from multiple departments and agencies.
- **Dedicated Funding Source:** A lack of flexible funding across modes was identified as a major barrier for multiple coordination and projects. Finding or developing a sustainable and committed funding source for operations, maintenance, and capital projects can streamline the process and make them more viable.

In addition to these four frequent findings, the literature summarized other key topics and initiatives to help support successful coordination for multimodal planning and projects, including:

- Supporting opportunities for collaboration among a wide variety of documents, studies and projects
- Gauging the political climate and governance, which could support or discourage multimodal projects
- Considering unique contracting practices, such as a design-build approach, to shorten project construction and planning
- Maintaining communication and supporting activities and initiatives involving the community and stakeholders
- Finding a specific person or organization to serve as the leader of the effort and spearhead the initiative
- Using momentum from previously successful multimodal projects for other initiatives
- Establishing supportive policies and legislation

Literature Review and Interviews

» Federal Guidance

- Minimal guidance for multimodal projects

Gap	Recommendation
No single location for multimodal guidance	Create a website with guidance and direction of multimodal projects
Little guidance on steps need to be taken from beginning to end of project	Provide joint FHWA / FTA guidance, best practices on meeting Federal requirements, and/or guidance on which Federal agency should lead
No clear guidance on initial coordination with FHWA or FTA	Develop guidance providing better understanding when to approach FHWA / FTA or when to start NEPA process
Full array of options for multimodal projects for NEPA is not highly visible	Provide more guidance on NEPA options and/or create website dedicated to multimodal project guidance
Definition of 'multimodal' is unclear	Establish a common FTA / FHWA definition of multimodal and provide examples
Projects receiving grants from 2+ Federal sources are hindered by multiple grant compliance requirements	Provide FHWA / FTA guidance on interpreting guidance from two Federal agencies or develop joint guidance
No guidance on multimodal agency coordination	Provide guidance for specific agency-agency type interactions

8

Research found that there is an overarching guidance gap from FTA and FHWA, specifically a lack of information specifically on multimodal projects, in particular for projects with highway and transit components. The overall gaps, and proposed recommendations to address each gap, are listed below:

- There is a lack of a single location for multimodal guidance.
 - **Recommendation:** Consider creating a website devoted to guidance and direction on multimodal projects.
- There is little guidance on the steps need to be taken from the beginning to end of a multimodal project.
 - **Recommendations:**
 - Consider providing joint FTA/FHWA guidance for common types of multimodal projects, on a webpage dedicated to multimodal project guidance; (E.g. guidance for specific common multimodal project types (e.g., BRT with designated lanes, multimodal stations, any facility that includes right of way for two or more modes);
 - Consider providing guidance and best practices on how to meet both FHWA and FTA requirements for projects that receive both FHWA and FTA funding. This guidance would focus on approaches to navigating and complying with all planning and programming FHWA and FTA compliance requirements throughout a project;
 - Consider providing joint FHWA/FTA guidance that indicates for each possible multimodal project type/situation, which Federal agency should be the lead or which Federal requirements should be followed (rather than both FHWA and FTA) would be exceptionally helpful in facilitating project advancement; or
 - Consider providing "One USDOT" guidance. Considering having FHWA and FTA jointly address compliance requirements and take steps to make compliance more straight forward. An example to consider could be the "One DOT" agreement signed for the "T-Rex" project in Denver. This document's purpose was primarily to set the principles that the agencies would move forward with one set of rules and one set of guidelines. (Each agency did keep their own DBE rules).
- Clear guidance is not available on when to initial coordination with FHWA or FTA on a multimodal project.
 - **Recommendation:** Consider developing guidance providing a better understanding as to when to approach FHWA / FTA or when to start the National Environmental Policy Act (NEPA) process. This would streamline the project and decrease confusion. Where conditions are right, there should be early notification and coordination with FTA/FHWA. Consider recommending 'trigger points' for initiating or accelerating coordination with the Federal agencies.
- Although there is guidance on NEPA, the full array of options for multimodal projects is not highly visible:
 - **Recommendation:** Consider providing more information or guidance as to NEPA options (such as using the Tiered NEPA approach), on a webpage dedicated to multimodal project guidance.
- The definition of 'multimodal' is unclear.
 - **Recommendation:** Consider establishing a common FHWA / FTA definition of this term and providing examples of project types, components, or criteria to meet this definition.
- Similar to other guidance gaps for multimodal projects, projects that receive grants from more than one Federal funding source are hindered by two sets of grant compliance requirements.
 - **Recommendation:** For Federal grant receipt and utilization – consider providing FHWA and FTA guidance on how to interpret guidance from two Federal agencies, or as indicated above, consider developing joint guidance.
- There is not guidance on multimodal agency coordination.
 - **Recommendation:** Consider providing guidance for specific agency-agency type interactions to ensure compliance with federal requirements (e.g., UTA/UDOT, transit agency/MPO).

Literature Review and Interviews

» Selected Case Studies

- Moving Ahead Bus Rapid Transit Project
City of Eugene, Oregon and Lane Transit District
 - › Portfolio Management Concept
- BaltimoreLink | Baltimore, Maryland
- Clifton Boulevard Transportation Enhancement Project | Cleveland, Ohio
- I-5 Transit Bypass Project (Bus on Shoulders) | Washington State DOT
 - › Practical Solutions
- South Capitol Rail Runner Station | New Mexico DOT
- Integrated Corridor Management US-75 | DART

CS conducted ten interviews (in some cases covering multiple projects per agency) to assess and recommend the list of case studies. Based on the results of the interviews, including the lessons learned, best practices, and transferability of these lessons, CS identified 5 particular projects that were recommended for Case Studies panel interviews, and one to be developed as a case study without a panel interview.

Key Challenges to Coordinate Multimodal Projects

- » Many agencies and jurisdictions still operate in **'siloed'** functional departments.
- » **Coordination** for projects with many components can be technically challenging and it is difficult to know the status of all of the moving parts.
- » **Compromise** is often required to stay on schedule and have a good project
- » It is essential to effectively conduct **coordinated public outreach** to key stakeholders
- » **Legal proceedings** for the transfer and use of funds can be a significant obstacle

10

Transportation solutions requiring multiple agencies, interests, goals and high degrees of effective coordination can expect (by their very nature) to face obstacles and project management challenges. The case studies profiled herein are no different – each tells a story (some of which are ongoing) of the need for all parties to buy into a common vision of project purpose and outcomes from the earliest stages of project conception. The high and visible commitment level of each agency brings about new degrees of resource sharing and resourcefulness – staff in one agency discover staff in another who have data, tools, and capability to meet analysis needs or the process leads to cross training and educational opportunities that otherwise would not have existed.

Funding is a big driver in the success of projects and a multi-agency coordinated approach can force staff to dig into the complexity of FHWA and FTA requirements and devise a funding strategy which leverages local, state, federal dollars to advance the project. Project management is often the opposite of a hierarchical approach – rather depending upon the stage of project development one agency may cede control to another. This requires trust and confidence which is built from day one and strengthened as each agency reaffirms its commitment through various expected (and unexpected) obstacles. Finally, as in any negotiated process, a level of compromise to defer individual interests for the sake of meeting broader, more comprehensive goals is a hallmark of each case study and integral to its success.

Key Challenges to Coordinate Multimodal Projects

- » **Compliance** with inconsistent state, FHWA, and FTA requirements is very challenging, and resource-intensive
- » In some projects, one agency needs to cede control to other agencies, this requires **trust and confidence** building to establish effective coordination
- » There are typically **insufficient funding** programs for transit projects
- » It can be challenging to correctly **identify partners** and ensure their involvement early in the project

11

Transportation solutions requiring multiple agencies, interests, goals and high degrees of effective coordination can expect (by their very nature) to face obstacles and project management challenges. The case studies profiled herein are no different – each tells a story (some of which are ongoing) of the need for all parties to buy into a common vision of project purpose and outcomes from the earliest stages of project conception. The high and visible commitment level of each agency brings about new degrees of resource sharing and resourcefulness – staff in one agency discover staff in another who have data, tools, and capability to meet analysis needs or the process leads to cross training and educational opportunities that otherwise would not have existed. Funding is a big driver in the success of projects and a multi-agency coordinated approach can force staff to dig into the complexity of FHWA and FTA requirements and devise a funding strategy which leverages local, state, federal dollars to advance the project.

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MovingAhead Bus Rapid Transit Project

- » Integrate regional **multimodal transportation and land use planning**.
- » A political **project champion** at varying levels of government is critical to success.
- » Conduct **joint outreach** to directly address local political concerns and reach all stakeholders.
- » Hold regularly scheduled **in-person meetings** for staff and/or stakeholders.
- » Coordinate the project from the **ground-up**, from planning to implementation.



Eugene, Oregon

12

The MovingAhead Bus Rapid Transit project, underway as of summer 2017, is an excellent demonstration of learning from past project implementation challenges and evolving planning processes and partnerships to improve multimodal project coordination. This project is a good example of how a jurisdiction and transit agency can coordinate bicycle and pedestrian projects into transit projects and across the transit system. It also identifies several areas where the Oregon Department of Transportation (ODOT) supported implementation of the BRT and Moving Ahead Bus Rapid Transit projects.

Lane Transit District, the Cities of Eugene and Springfield, the Lane Council of Governments, and the local community were involved in the implementation of these routes, building off of the State's support for multimodal projects since the mid-1990s. Many successful projects have a 'champion'. For Moving Ahead, a benefit of this project is its collaborative nature, therefore, there is not one agency 'leading' nor one champion. It wasn't a 'one leader – the rest follow' type of situation. Instead, staff from LTD and the City of Eugene banded together to jointly manage and support the MovingAhead BRT project as expansion of BRT and bicycle/pedestrian facilities. They all saw approaching this together as a necessity. They were joint champions.

Project Summary

Lane Transit District (LTD) is the transit operator in Lane County, Oregon, primarily operating in the metropolitan areas of Eugene and Springfield. In addition to fixed bus routes and ADA service, LTD operates two bus rapid transit (BRT) lines, with a third set to open in fall of 2017. LTD started operating BRT, called Emerald Express (EmX), in 2007, connecting key destinations throughout the region. LTD, the Cities of Eugene and Springfield, the Lane Council of Governments, and the local community were involved in the implementation of these routes, building off of the state's support for multimodal projects since the mid-1990s.

After receiving significant resistance to previous BRT projects from stakeholders such as local businesses, LTD and the cities learned numerous lessons from implementation of the first EmX lines, including that transit projects need to be coordinated and supportive of larger regional planning efforts and coordinated with future land use. They also learned that having the City be a key lead in transit project implementation is beneficial, and that outreach to local businesses must be direct and targeted. The cities and LTD staff have learned that the system needs to be planned holistically, together, considering all modes. See the Portfolio Management concept described at the end of this case study for an evolving approach to holistic corridor planning. The lessons from EmX implementation led to the MovingAhead Bus Rapid Transit project, a collaborative project of the City of Eugene and LTD to work with the community and stakeholders to prioritize corridors for near-term transit, bicycle, and pedestrian infrastructure enhancements. In the past, these project types were implemented independently, rather than in a coordinated fashion.

LTD, the City of Eugene, and partners are working together to help the public understand the nature of partnership; they need to continue education that Moving Ahead Bus Rapid Transit project is not only a LTD project, but also owned by the City of Eugene. There was a change in branding to demonstrate this unity, strategically showing that the City of Eugene and LTD joined together to implement this project. The MovingAhead BRT project logo and brand displays this partnership: this is a clearing house for transit/bike/pedestrian solutions for the entire community, not just one agency.

A key value of the MovingAhead BRT project is the coordination of transit and future land use assumptions, providing mobility to corridors with greatest growth in population and employment. Another purpose of the project is to make clear how transit projects support regional economic, quality of life, and mobility goals, building from and implementing the local plans, Envision Eugene and LTD's Long Range Transit Plan. As of writing this document (Summer 2017), the MovingAhead BRT project is underway.

For Reference only:

Primary Agencies

- Lane Transit District (LTD) – For the MovingAhead BRT Project, LTD is a project sponsor and project management responsibilities in collaboration with the City of Eugene.
- The Cities of Eugene and Springfield – The Cities are responsible for planning and programming for roadway, bicycle, and pedestrian projects. For the MovingAhead BRT project, the City of Eugene is the project sponsor and has project management responsibilities in collaboration with LTD. Springfield is not part of the Moving Ahead Bus Rapid Transit project as the Springfield BRT system is largely built out.
- Lane Council of Governments (Central Lane MPO) – Because of the NEPA process, Federal guidelines require the MPO to be involved in the selection of a locally preferred alternative. Many of the processes have to be approved by the MPO. The MPO also funded some public outreach. They helped implement the transit vision, represented broader communities for specific corridors, and participated in project management/documentation work. The MPO has regional meetings every week, where participants not directly participating in committees can get project updates. The MPO meetings are a good place for different agencies to come together, develop relationships, and share information.
- Oregon DOT – ODOT participates in the MovingAhead BRT project and is always active in the local agencies' processes. The DOT has an organization structure where an ODOT representative is available to talk on day to day basis.
- The Eugene City Council and LTD Board – Final decision-makers on the project.
- The Main Street Governance Team – Project guidance as jurisdictional representatives, and dispute resolution body. Adopted formal protocols for operation and decision-making.
- Stakeholder Advisory Committee – Designed to be representative of community-wide and corridor interests. Role to advise the CC and LTD Board on the decision to pursue a project or not.
- Community and business leaders – early conversations to test the waters for a project.
- Better Eugene Springfield Transit (BEST) – Formed as counter to West Eugene EmX project opponents, broadened role over time into metro-wide role and took on roadway safety.
- Fronting business and property owners – Specifically involved as those potentially or perceived to be most negatively impacted.

BaltimoreLink

- » Develop a **realistic timeline**.
- » Encourage as much coordination as possible at all staff levels, **in-person**.
- » Do not hesitate to **change the norm**.
- » **Break down barriers** of miscommunication.
- » Understand the **perspectives** of partner agencies and transit users.
- » **Be flexible**.



Baltimore, Maryland

13

NCHRP selected this case study because of the numerous and effective coordination approaches used by the MDOT-MTA and partner agencies. The project exemplifies a strong State DOT role, coordination required within a large city to undertake a large and far-reaching project. This project also encountered challenges that might be addressed by revisions to Federal guidance.

Project Summary

The BaltimoreLink project addresses three overall improvements: service, infrastructure, and outreach. The change in service will enhance the current transit network by strengthening connections and mobility. To support the reliability and accessibility of this new service, MDOT-MTA and the City of Baltimore are installing various infrastructure improvements, including dedicated bus lanes, transit signal priority, transfer facilities, wayfinding signs and maps, and last mile connections through bike share, car share, and local transit operators. The outreach component included gathering feedback to draft plans, and also included working closely with the community to communicate about change in service, helping riders navigate the system, and gathering community feedback. BaltimoreLink launched in June, 2017. The agencies involved in planning and implementing BaltimoreLink have identified key lessons learned that can be applied to coordination of future transit projects. The lessons included that agencies should develop a realistic timeline, encourage as much coordination as possible at all staff levels, especially in-person meetings; take chances and do not hesitate to change the norm; break down barriers of miscommunication; seek to understand the perspectives of partner agencies and transit users; and be flexible.

Coordination of MDOT-MTA and the City also led to other positive outcomes for cost efficiency, project quality, and project schedule. For example, when designing and purchasing new signs, rather than the City and transit agency producing and installing separate signs, the City language for the signs "Tow-Away Zone" was added to the bus-only lane signs. Coordination allowed for better siting of transfer locations, and an accelerated permitting process. MDOT-MTA also conducted several large, day-long workshops for all agencies involved in the BaltimoreLink project. The workshops' purpose was to bring all working groups and organizations 'up to speed', presenting the progress of subprojects and plans. The workshops provided a chance to ensure everyone had access to all planning and construction updates, so that each focus group or agency can ensure all plans and project components align. The workshops employed strategies to ensure workshops are interactive and to guarantee each group can gather ideas from all partners to align and improve the Plan. These workshops were modeled after a strategic planning workshop, to break down silos, bring everyone up to the same level of knowledge.

For Reference Only:

BaltimoreLink was a multifaceted project, significant and effective coordination was necessary to plan and implement a successful project.

The Maryland Department of Transportation – Maryland Transit Administration (MDOT-MTA) is the transit operator within the State of Maryland and is a Transportation Business Unit of the Maryland Department of Transportation (MDOT). The administration oversees a wide variety of transit services, operating local and commuter buses, light rail, metro subway, commuter trains, and paratransit services. The MDOT-MTA Office of Planning and Programming led the Planning and Implementation of BaltimoreLink, with support from the MDOT Secretary's Office (TSO), Office of Planning and Capital Programming (OPCP), and Office of Real Estate, the Baltimore City Department of Transportation and Department of Planning, the Maryland Department of Planning and transit advocates. There was strong support for this project at various levels, including Governor Hogan, Transportation Secretary Pete Rahn, and MDOT-MTA Director of Planning and Programming, Kevin Quinn (Acting Administrator of the MDOT-MTA as of summer 2017). **Office of Planning and Programming, Maryland Transit Administration (MDOT-MTA)** – As the transit operator, MDOT-MTA was responsible for the project definition, which include improvements to service, infrastructure, and operations. In addition to transit improvements, the project was to include implementing bike share at transit stations and add bike parking at transit stations.

The Secretary's Office (TSO), Office of Planning and Capital Programming (OPCP) Maryland Department of Transportation – Provided financing, helped to coordinate a successful TIGER Grant application (North Avenue Project) (\$27 million) which helped mend the relationship between Baltimore City and MTA/MDOT, participated in biweekly meetings. The Secretary's Office also was engaged when there were issues coordinating between entities.

Baltimore City Department of Transportation – Participated in planning activities, helped to scope of work and select the project consultant team, coordinated to implement bus lanes and other improvements in the City right-of-way to improve access for multimodal transportation, and identified other opportunities for collaboration, such as conversion of a City parking lot to a MDOT-MTA bus loop.

Maryland Department of Planning – Provided coordination early on.

Transit Advocates – Supported project and helped improve routing and communicate to a broader audience about the planned changes.

Integrated Corridor Management US-75

- » Use **data and a travel demand model** to make informed decisions. For ICM, data was used to develop the model and the 144 predeveloped response plans, this provided a forum that benefited from expertise of both engineers and planners.
- » Conducted monthly meetings to discuss what did and did not work about the project.
- » Ensure **involvement of all agencies** who all have to approve of the selected ICM plan. For US-75, this requirement for real-time approval was key to getting all agencies agree to the ICM project.



14

This case study that provides an overview of successful Integrated Corridor Management (ICM). This project effectively crossed boundaries due to roadway ownership, mode, and jurisdiction, treating the entire network as one and have all agencies respond as a team.

Project Summary

Dallas Area Rapid Transit (DART) is the transit operator in Dallas, Texas and 12 surrounding cities, providing a wide range of services to over 200,000 passengers per day, including light rail, commuter rail, local bus, and paratransit service.

DART first lead the U.S.-75 Integrated Corridor Management (ICM) project, a collaborative and cooperative project for improving service along the U.S.-75 corridor; it is now lead by TXDOT. The project is in collaboration with the City of Plano, City of Dallas, City of Richardson, North Central Texas Council NCTCOG), Texas Department of Transportation (TxDOT), Texas Transportation Institute (TTI), and Southern Methodist University (SMU). U.S.-75 ICM began its development in 2006 and became fully operational in 2013.

The project aims to improve the flow of travel in real-time the corridor through multimodal and multijurisdictional coordination. The travel corridor includes DART's Line Light Rail Transit (LRT) and bus network, U.S.-75, hundreds of signals, tollways, managed HOV lanes, numerous local arterials and multiple traffic management centers. Pre-established and approved plans would be put into actions in response to major highway incidents, weather events, or other nonrecurring congestion. This cooperative management plan with the possible events and planned responses modeled was reviewed and approved by all partners in advance to allow for quick action. When an event occurs, all the participating agencies must provide verbal approval of the response plan to allow it to be implemented. With real-time data and preset responses, DART could make same-day decisions such as adding additional bus service or dispatching additional trains. As the lead agency in planning and implementing U.S.-75 ICM, DART leadership has identified key lessons learned that can be applied for future coordination. The lessons included having strong leadership with financial resources and technical expertise, having full-time staff solely working on the project, strong communication between involved partners, and utilizing the travel demand model to support consensus agreement on the response plan.

For Reference Only:

Project Leads and Key Stakeholders

The project aims to improve the flow of travel in real-time the corridor through multimodal and multijurisdictional coordination.

Dallas Area Rapid Transit (DART) is the transit operator in Dallas, Texas and 12 surrounding cities, providing a wide range of services to over 200,000 passengers per day, including light rail, commuter rail, local bus, and paratransit service. DART first lead the U.S.-75 Integrated Corridor Management (ICM) project, a collaborative and cooperative project for improving service along the U.S.-75 corridor; it is now lead by TXDOT. The project is in collaboration with the City of Plano, City of Dallas, City of Richardson, North Central Texas Council (NCTCOG), Texas Department of Transportation (TxDOT), Texas Transportation Institute (TTI), and Southern Methodist University (SMU).

Primary Agencies

- Dallas Area Rapid Transit (DART) – ICM Manager.
- Plano, City of Dallas, City of Richardson – Participated in development of the response plans and response through Traffic Management Centers (TMC).
- North Central Texas Council (NCTCOG) – Supported coordination, as agencies were accustomed to coordinating through NCTCOG meetings.
- Texas Department of Transportation (TxDOT) – Limited participation at first due to pilot nature of the project, role escalated in 2014 when it took on role of the ICM Coordinator.
- Texas Transportation Institute (TTI), and Southern Methodist University (SMU) – Involved from a research perspective.

Clifton Boulevard Transportation Enhancement Project

- » Align project goals with regional goals.
- » Create a **funding** package from a variety of sources.
- » Provide ample opportunities for **input from stakeholders**.
- » Enable the **project champion** to lead coordination efforts.



Cleveland and Lakewood, Ohio

15

This case study highlights a project for a primary corridor and a project type likely to be repeated across the U.S. The best practices conveyed in this case study can be applied broadly. This case study is representative of a mid-sized urban area.

Project Summary

The Clifton Boulevard Transportation Enhancement Project upgraded four miles of the corridor, enhancing access for all transportation modes. Beginning in 2007, the cities of Lakewood and Cleveland worked together to develop a conceptual plan to enhance Clifton Boulevard. The initial concept was to implement traffic calming measures to enhance access to the corridor for all transportation modes and improve the landscaping, lighting and transportation amenities. In 2009, RTA applied for and received federal stimulus funds to design and study the project and evaluate needs. The study investigated how to make the wide streets more easily accommodate transit, alleviate congestion, and address safety issues, especially for bicyclists and pedestrians. The findings resulted in a BRT line along the corridor, with a variety of other retrofits and enhancements such as new branded buses, rebuilt streets and sidewalks, and new bus shelters. The BRT service was named the Cleveland State Line. It opened in December 2014.

The RTA was the lead agency for the project. The City of Cleveland, City of Lakewood, Ohio Department of Transportation, Northeast Ohio Areawide Coordinating Agency (NOACA), and Cleveland State University (CSU) also played significant roles.

Each activity in the coordination process resulted in multiple outcomes to sustain and maintain project momentum. Key lessons were drawn from each step of the process and have broad applicability to similar projects in comparable metropolitan areas. In particular those lessons include having a project champion to skillfully lead the coordination effort; identification of project goals that align with regional goals; development of a funding package from a variety of sources; and ample opportunities for input from multiple, diverse stakeholders. These actions, encapsulated by the lessons learned and described in further detail below, are applicable to practitioners who seek to implement a multimodal success story in their respective context.

For Reference only:

Project Leads and Key Stakeholders

The Greater Cleveland Regional Transportation Authority (RTA) is the public transit agency for Cleveland, OH and surrounding suburbs. RTA owns and operates the RTA Rapid Transit rail system, which consists of one heavy rail and two light rail lines, and extensive bus service and downtown trolley service.

Primary Agencies

- Greater Cleveland Regional Transportation Authority (RTA) – Served as the project lead. This was a natural fit due to the type of project and their involvement, relationship to all project partners.
- The City of Cleveland and City of Lakeland, through which Clifton Boulevard runs. Staff from both cities were involved in project details.
- Ohio Department of Transportation (ODOT) – Own the roadway and partnered in finding flexible, financial solutions.
- Cleveland State University (CSU) – Purchased naming rights to the new Bus Rapid Transit (BRT) service. Many CSU students use the service.
- Northeast Ohio Areawide Coordinating Agency (NOACA) – The transportation and environmental planning agency serving Cuyahoga, Geauga, Lake, Lorain and Medina counties. NOACA is also the designated MPO for Northeast Ohio. NOACA assembled project funding from several sources

I-5 Transit Bypass Project (Bus on Shoulder)

- » Think **outside of the box** and consider unorthodox approaches.
- » Identify ways to **optimize the system** and make best use of existing highway capacity.
- » Have a strong **project champion** that is willing to lead the coordination effort.
- » Identify an **evaluation plan** to monitor, measure, and report on success.



Seattle and Everett, Washington

16

This case study demonstrates collaborative nature of this project to effectively address increasing levels of congestion in a cost effective manner, on Interstate 5 (I-5) between Seattle and the city of Everett, which lies approximately 25 miles to the north. The I-5 Transit Bypass Project (Bus on Shoulder) is a forthcoming project (not yet implemented as of summer 2017) example that exemplifies the Practical Solutions approach described at the end of this case study.

Project Summary

The Interstate 5 (I-5) Transit Bypass (Bus on Shoulders) Project was conceived as a means to address increasing levels of congestion on I-5 between Seattle and the City of Everett, which lies approximately 25 miles to the north. Economic and residential growth have significantly increased demand in the travel corridor exacerbating peak hour congestion and decreasing reliability. In recent years, High Occupancy Vehicle (HOV) travel times have increased by almost 20 minutes, and the HOV lanes in the corridor are performing substantially below travel speed standards. As a result transit reliability has diminished with more than 25 percent of bus trips arriving late. Buses and park-and-ride facilities remain overcrowded, with a significant number of people standing for trips of 65 minutes or more. These conditions highlight the fact no one agency has historically been responsible to address the central issues – and the level of financial resources needed to apply a larger, comprehensive solution are unavailable. To address these issues, WSDOT and Community Transit initiated a multiagency assessment to develop a near-term (one to four year) action plan to improve transit performance in the corridor. A one day workshop was held in March 2015 to jump start this effort. At the workshop, a small group of agency experts brainstormed and assessed options and developed a list of feasible improvements. A work team comprised of key staff from Community Transit, WSDOT, First Transit and Spokane Transit developed a list of potential transit bypass locations and other possible actions at the workshop. They then began to engage other agencies and form an informal coalition to pursue improvements. Since then, WSDOT and Community Transit developed a proposal to test the use of freeway shoulders as transit bypass lanes during heavy traffic congestion on southbound I-5.

The effort resulted in a plan to implement the solution. Through additional study, the group discovered that some drainage basins along the shoulders need to be reinforced to handle the additional load of buses. The agencies set out to secure additional funding to reinforce the basins and advertise to support constructability. Community Transit was the lead agency for the project and WSDOT was a primary partner, not only in provision of funding but also in leading concept development and coordination. Additional agencies with significant involvement include Puget Sound Regional Council (PSRC), Sound Transit, FHWA, FTA, Washington State Patrol, and Spokane Transit (provided independent, outside of the region input) The PSRC offered tools, facilitation, and planning resources to move the project forward and facilitated conversation between agencies, provided data analysis of travel on the corridor, and briefed the board.

For Reference Only:

Project Leads and Key Stakeholders

The project is designed to directly address the increasing travel demand between Everett and Seattle and alleviate the resulting highway congestion, improve travel time, and improve transit reliability.

Washington State Department of Transportation (WSDOT) and Community Transit initiated a multiagency assessment to develop a near term (one to four year) action plan to improve transit performance in the corridor. A one day workshop was held in March 2015 to jump start this effort. At the workshop, a small group of agency experts brainstormed and assessed options and developed a list of feasible improvements. A work team comprised of key staff from Community Transit, WSDOT, First Transit and Spokane Transit developed a list of potential transit bypass locations and other possible actions at the workshop. They then began to engage other agencies (such as Puget Sound Regional Council) to form an informal coalition to pursue improvements. Since then, WSDOT and Community Transit developed a proposal to test the use of freeway shoulders as transit bypass lanes during heavy traffic congestion on southbound I-5.

Primary Agencies

- Washington Department of Transportation (WSDOT) – Owns and operates I-5, and served as a primary partner.
- Community Transit – Public transit authority, and operator of local bus, paratransit, vanpool, and commuter bus services. Served as a primary partner.
- Spokane Transit – Attended the brainstorm workshop, although they do not operate buses in the Seattle region (Spokane is located in eastern Washington).
- Puget Sound Regional Council – Served in a supporting role. Their goal was to facilitate the conversation to move the project along when needed. Developed reports of conditions in the I-5 corridor that helped demonstrate the need to find solutions.
- Sound Transit – Regional transit authority that operates light rail, commuter rail, and express bus services. Sound Transit 3 (ST3), a ballot measure to approve funding for Sound transit service expansion, was approved by voters in 2016. ST3 added funding for this projects; Sound Transit recognized the value and identified the project as one deserving of financial support.
- Washington State Patrol – Supportive and accommodating of this effort. They operate on the shoulders of the Interstate, which now need to be shared with transit, so it was critical to have them on board as a willing partner. WSDOT took the lead on working with them.
- FHWA and FTA – Have been a key partner in supporting this project. The project is the first of its kind operating in the region.

South Capitol Rail Runner Station

- » A strong **project champion** at the highest level of government in the State, is highly beneficial.
- » Take steps to ensure **ownership and interest** in the success of the project.
- » Provide ample opportunities for **public involvement** from citizens and stakeholders, including planning and design input on station locations and connection to trails.
- » Hold frequent **in-person meetings** with key agencies throughout project planning and implementation.



Santa Fe, New Mexico

17

This case study provides perspectives of a smaller city, and the southwestern geographical area. This case study also highlights coordination practices to produce a project that focuses on a specific project element – a transit station.

Project Summary

The South Capitol Rail Runner Station is a station in Santa Fe serving New Mexico's Rail Runner Express commuter rail, which connects the metropolitan areas of Santa Fe and Albuquerque, with the route parallel to Interstate 25 (I-25). The first phase of the Rail Runner system began operation in 2006. The second phase, an extension to Santa Fe, opened in late 2015.

The South Capitol Rail Runner Station was the first large state-regional-local initiative of its type.

The implementation of commuter rail service in this corridor began in August of 2003 when Governor Bill Richardson announced the State would pursue the implementation of commuter rail. In September 2003, the State Legislature passed a \$1.6 billion transportation improvement package that included implementation of this service. In February 2008 work began on site plans and design work for the South Capitol station. The Station includes a park-and-ride lot along with connections to a variety of bus services by multiple providers, including Santa Fe Trails, Santa Fe Pickup, New Mexico Department of Transportation (NMDOT) Park and Ride, and North Central Regional Transit District (NCRTD). The two-sided platform is a major stop for business commuters and for those wishing to make bus connections to other locations in and around Santa Fe. The State Government complex is in the vicinity of the station; other development, such as the construction of 15 three-story loft-style residences in 2008, has changed foot traffic, land use patterns, and economic vibrancy in the area. The commuter-oriented lofts represent a notable departure from typical density patterns in Santa Fe.

The development of service in this corridor required concurrent and well timed and coordinated efforts on many fronts. In addition to the agencies listed above, Rio Metro Regional Transit District, City of Santa Fe, Santa Fe MPO, and Mid-Region Council of Governments (MRCOG) were directly involved.

The agencies involved in planning and implementing the South Capitol Station have identified key lessons learned that can be applied to coordination for similar projects in other metropolitan areas, particularly small urban areas on the edge of rural locations. In particular those lessons include:

Having a strong project champion at the highest level of government in the State, and capitalizing on favorable conditions for success;

Successful coordination across multiple agencies, who all had ownership and interest in the success of the project;

Ample opportunities for public involvement from citizens and stakeholders, including planning and design input on station locations and connection to trails;

Holding frequent in-person meetings with key agencies throughout project planning and implementation; and

The panel interviews included a number of questions to establish the context, discuss the coordination processes, and coordination outcomes for the South Capitol Rail Runner Station Project. This section provides the questions, and a summary of the responses to the questions. Comments are attributed in cases to provide clarity.

For Reference Only:

Project Leads and Key Stakeholders

New Mexico Department of Transportation (NMDOT) was in the lead role. There was agreement because NMDOT was paying for the rail service and it was a priority of the governor. At other points, other agencies took the lead on certain tasks. The Mid-Region Council of Governments (MRCOG) took a lead role later in the project with organizing meetings and working with the public. They were able to operate with fewer restrictions than NMDOT staff would have. This allowed the project to be completed on time.

Primary Agencies

- New Mexico Department of Transportation (NMDOT) – Owns the rail line and operates park and ride lots.
- North Central Regional Transit District – Provides funding. They provide about 5 percent of the Rail Runner funding.
- Rio Metro Regional Transit District – Operates the train.
- City of Santa Fe – Owns and operate buses.
- Santa Fe MPO – Provided planning coordination, convened stakeholders for station evaluation, and provided data and mapping analysis.
- Santa Fe Trails – The City of Santa Fe bus system.
- Mid-Region Council of Governments, which provided planning and design coordination.
- The Chamber of Commerce and the travel and tourism industry – these parties were supportive of the commuter rail project.

Key Lessons

- » Meeting in-person still matters in the digital age
 - In-person meetings are critical, as the relationships that are developed are the backbone to successful project planning and delivery.
- » Be flexible and ready to adapt
 - Flexibility, adaptability and collaboration are critical to coordination for multimodal projects.
- » Aligning goals
 - Align the multimodal project with the existing planning process whenever possible; define common goals for the project and demonstrate how the project will support regional goals.

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Key lessons from these case studies include:

- Meeting in-person still matters in the digital age
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Technology Transfer Documents

1. Final Report
2. Quick Reference Guide (20 pages)
3. Flyer (2 pages)
4. PowerPoint Presentation

- » User-Friendly Materials
- » Quickly glean research and key findings
- » Materials can be found on the project website:

<http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4156>



Today we'll provide an overview of the research and resulting products for NCHRP 20-65, Task 67.

- These include:
- Final Report
- Quick Reference Guide (20 pages)
- Flyer (2 pages)
- PowerPoint Presentation (This presentation)

Materials can be found on the project website:

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NCHRP Project 20-65, Task 67

Coordinated Multimodal Project Planning





Agenda

- » Welcome and Introductions
- » Project Purpose
- » Research Approach
- » Research Findings
- » Key Challenges
- » Key Lessons
- » Technical Transfer Documents

Ground Rules

- » If you have a question, please raise your hand, we will address questions during designated break points
- » If you need to step away, please do not press hold.
- » Please put yourself on mute
- » Thank you!

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Research

» Purpose:

- **Synthesize** the practice of multimodal coordination across State DOT, MPOs, and Regional Transit Agencies
- **Highlight** examples of successful coordination between highway and transit improvements (such as in a major corridor) and in the role of State DOT project delivery of multimodal transportation solutions
- **Document** and communicate successful strategies which can be duplicated in a variety of contexts

Research

» Approach:

- Conduct **Literature Review and Interviews**
 - › Investigate distinguishing features of multimodal transportation planning / coordination and identify areas of the country for case studies / research
- Research / Interview **Six Case Studies**
 - › Develop case studies which encapsulate successful models of coordination and project delivery for multimodal projects through panel interviews
- Prepare **Technical Assistance / Technical Transfer Documents**
 - › Synthesize findings from literature review, interviews, and case study panel interviews into various technology transfer documents, including a quick reference guide, one page flyer, and PowerPoint presentation
- Conduct **Webinars**
 - › Develop webinars to panel members, case study interviewees, and FHWA / FTA staff to present findings and gather feedback for the final documents
- **Finalized Technology Transfer Documents and Final Report**

Preliminary Findings – Characteristics of Successful Multimodal Projects

» Literature Review and Interviews

- **Shared Vision and Goals:**
 - › Allow a connection between planning and operations across departments and agencies and supporting open communication and cooperation
- **Consolidated Operations and Organization:**
 - › Organize intra-agency departments to maximize efficiency and support multimodal discussion and collaboration
- **Shared Data and Information:**
 - › Ensure staff have adequate data, analysis, and decision-making tools across multiple modes and departments
- **Dedicated Funding Source:**
 - › A lack of flexible funding across modes was identified as a major barrier for multiple coordination and projects

Literature Review and Interviews

» Federal Guidance

- Minimal guidance for multimodal projects

Gap	Recommendation
No single location for multimodal guidance	Create a website with guidance and direction of multimodal projects
Little guidance on steps need to be taken from beginning to end of project	Provide joint FHWA / FTA guidance, best practices on meeting Federal requirements, and/or guidance on which Federal agency should lead
No clear guidance on initial coordination with FHWA or FTA	Develop guidance providing better understanding when to approach FHWA / FTA or when to start NEPA process
Full array of options for multimodal projects for NEPA is not highly visible	Provide more guidance on NEPA options and/or create website dedicated to multimodal project guidance
Definition of 'multimodal' is unclear	Establish a common FTA / FHWA definition of multimodal and provide examples
Projects receiving grants from 2+ Federal sources are hindered by multiple grant compliance requirements	Provide FHWA / FTA guidance on interpreting guidance from two Federal agencies or develop joint guidance
No guidance on multimodal agency coordination	Provide guidance for specific agency-agency type interactions

Literature Review and Interviews

» Selected Case Studies

- Moving Ahead Bus Rapid Transit Project
City of Eugene, Oregon and Lane Transit District
 - › Portfolio Management Concept
- BaltimoreLink | Baltimore, Maryland
- Clifton Boulevard Transportation Enhancement Project | Cleveland, Ohio
- I-5 Transit Bypass Project (Bus on Shoulders) | Washington State DOT
 - › Practical Solutions
- South Capitol Rail Runner Station | New Mexico DOT
- Integrated Corridor Management US-75 | DART

Key Challenges to Coordinate Multimodal Projects

- » Many agencies and jurisdictions still operate in **'siloed'** functional departments.
- » **Coordination** for projects with many components can be technically challenging and it is difficult to know the status of all of the moving parts.
- » **Compromise** is often required to stay on schedule and have a good project
- » It is essential to effectively conduct **coordinated public outreach** to key stakeholders
- » **Legal proceedings** for the transfer and use of funds can be a significant obstacle

Key Challenges to Coordinate Multimodal Projects

- » **Compliance** with inconsistent state, FHWA, and FTA requirements is very challenging, and resource-intensive
- » In some projects, one agency needs to cede control to other agencies, this requires **trust and confidence** building to establish effective coordination
- » There are typically **insufficient funding** programs for transit projects
- » It can be challenging to correctly **identify partners** and ensure their involvement early in the project

Moving Ahead Bus Rapid Transit Project

- » Integrate regional **multimodal transportation** and **land use** planning.
- » A political **project champion** at varying levels of government is critical to success.
- » Conduct **joint outreach** to directly address local political concerns and reach all stakeholders.
- » Hold regularly scheduled **in-person meetings** for staff and/or stakeholders.
- » Coordinate the project from the **ground-up**, from planning to implementation.



Eugene, Oregon

BaltimoreLink

- » Develop a **realistic timeline**.
- » Encourage as much coordination as possible at all staff levels, **in-person**.
- » Do not hesitate to **change the norm**.
- » **Break down barriers** of miscommunication.
- » Understand the **perspectives** of partner agencies and transit users.
- » Be **flexible**.



Baltimore, Maryland

Integrated Corridor Management US-75

- » Use **data and a travel demand model** to make informed decisions. For ICM, data was used to develop the model and the 144 predeveloped response plans, this provided a forum that benefited from expertise of both engineers and planners.
- » Conducted monthly meetings to discuss what did and did not work about the project.
- » Ensure **involvement of all agencies** who all have to approve of the selected ICM plan. For US-75, this requirement for real-time approval was key to getting all agencies agree to the ICM project.



Clifton Boulevard Transportation Enhancement Project

- » **Align** project goals with regional goals.
- » Create a **funding** package from a variety of sources.
- » Provide ample opportunities for **input from stakeholders**.
- » Enable the **project champion** to lead coordination efforts.



Cleveland and Lakewood, Ohio

I-5 Transit Bypass Project (Bus on Shoulder)

- » Think **outside of the box** and consider unorthodox approaches.
- » Identify ways to **optimize the system** and make best use of existing highway capacity.
- » Have a strong **project champion** that is willing to lead the coordination effort.
- » Identify an **evaluation plan** to monitor, measure, and report on success.



Seattle and Everett, Washington

South Capitol Rail Runner Station

- » A strong **project champion** at the highest level of government in the State, is highly beneficial.
- » Take steps to ensure **ownership and interest** in the success of the project.
- » Provide ample opportunities for **public involvement** from citizens and stakeholders, including planning and design input on station locations and connection to trails.
- » Hold frequent **in-person meetings** with key agencies throughout project planning and implementation.



Santa Fe, New Mexico

Key Lessons

- » Meeting in-person still matters in the digital age
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