

Finding a Win-Win: Planning and Data-Sharing Partnerships between Governments and Public Land Management Agencies

Memorandum 2: Methodology

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Introduction

This memorandum summarizes the proposed methodology for collecting and analyzing data and information in support of an applied research study titled, *Finding a Win-Win: Planning and Data-Sharing Partnerships between Governments and Public Land Management Agencies*.

The specific goals of this project are to:

- Identify examples of information coordination between Public Land Management Agencies (PLMAs) and transportation partners that result in process efficiencies, cost savings, and more effective transportation system delivery and/or management.
- Develop a suite of tools, resources, and usage guidelines to aid PLMAs and their partners in improving data coordination for better transportation systems.

This memorandum describes:

- The research questions to be addressed;
- The information and data needed;
- The stakeholder entities and individuals from whom to gather the information and data;
- The proposed methods to collect the information and data;
- Assumptions that will inform the methodology; and
- The general timeframe for the Data Collection and Analysis task (Task C).

This methodology is based in part on the information documented in *Memorandum 1: Background and Literature Review (March 2021)*.¹

Definition of Key Terms

The research team provides the following definitions as applied to this Study. These terms are defined in additional detail in *Memorandum 1: Background and Literature Review*.²

Transportation Agency/Organization

For the purposes of this Study, “transportation agency” or “transportation organization” refers to agencies with jurisdiction, planning, funding, ownership, or management responsibility for transportation systems (e.g., roads, trails, transit, marine, or aviation systems). Examples may include State Departments of Transportation (DOT), Metropolitan Planning Organizations (MPO), and other local or agency related divisions focusing on transportation issues.

Public Land Management Agency

A Public Land Management Agency (PLMA) is any public agency that manages land for public access and use. These uses can include recreation, resource protection, and economic uses, such as resource extraction or energy production. PLMAs include federal land management agencies, as well as parks and conservation agencies managed by states, regional governments, counties, or municipalities. PLMAs may own and manage transportation systems within their boundaries.

¹ Federal Highway Administration. 2021. “Finding a Win-Win: Planning and Data-Sharing Partnerships between Governments and Public Land Management Agencies. Memorandum 1: Background and Literature Review.” <https://highways.dot.gov/federal-lands/programs-planning/studies/pads>.

² Ibid.

Research Questions

Accurate and up-to-date data is critical for transportation planning; however, the types of data available and the process for accessing them are not always clear, especially when applied to transportation systems that provide access to or within public lands. This research project aims to fill some of these gaps, and considers both the data and the process of sharing data.

In order to focus this research on planning and data sharing partnerships, the study team developed high-level research questions:

- Why do PLMAs and transportation agencies share data?
- How do PLMAs and transportation agencies share and use data?
- What are the challenges to data sharing?

These high-level questions served as the basis for the literature review, and the project team will further explore them in later phases of this project. To address these questions, the project team has developed the following, more specific research questions:

- What types of data do PLMAs and transportation agencies use to support planning on public lands?
- How do PLMAs and transportation agencies use data to inform decision-making?
- What are the characteristics of successful PLMA and transportation agency data sharing examples?
- What are the barriers to effective data sharing between PLMAs and transportation agencies?
- What do PLMAs and transportation agencies need to share data more effectively?

This memo expands upon each of these high-level research questions below.

[What types of data do PLMAs and transportation agencies use to support planning on public lands?](#)

Establishing data sharing partnerships requires determining which data must be, could be, or may not need to be shared for transportation planning on public lands. Once planners identify the data sets, they are better positioned to determine whether they exist, who has them, and the quality of the data.

This research project will explore:

- The primary types of transportation data for transportation planning in a public lands context; and
- Additional types of transportation data or transportation-related data that could be beneficial when applied to this process.

[How do PLMAs and state/local transportation partners use data to inform decision-making?](#)

For this study, the team will review how PLMAs and their federal, state, and local agency partners approach transportation decisions across the entirety of the transportation project lifecycle (e.g., planning, project selection, design, operations, maintenance, etc.). Although this research project focuses primarily on using data sharing to support transportation planning, agencies' decision-making

processes typically apply across project phases. As a result, the project team will also consider data sharing throughout the transportation project lifecycle.

The research project will explore:

- State and local planning processes relevant to PLMAs;
- PLMA planning processes relevant to state and local transportation agencies;
- Differences and similarities in the goals for transportation data sharing between PLMAs and transportation agencies;
- Differences and similarities in transportation data access and analysis between these groups;
- Stage of the planning process or lifecycle process that data is shared; and
- Additional stakeholders relevant to PLMA, state, and local transportation planning processes.

What are the characteristics of successful public lands information/data sharing examples?

The literature review informed common practices for establishing data sharing partnerships. This research study builds on that background by identifying practices specific to successful examples of sharing transportation data between PLMAs and partners.

The research project will explore:

- Motivations for data sharing partnerships;
- The communication and coordination efforts to initiate and build data sharing partnerships;
- The mechanisms, methods, or platforms agencies use to share transportation data; and
- Outcomes of data sharing partnerships, such as expected benefits, realized benefits, and unanticipated failures.

What are the barriers to effective data sharing between PLMAs and transportation agencies?

This part of the research will focus on what barriers exist to effective data sharing between PLMAs and transportation agencies. This will build on existing literature on barriers to effective data sharing partnerships, and use information from case studies to identify barriers specific to a public lands context.

The research project will explore:

- At what stage in the data sharing process agencies face challenges;
- Challenges associated with sharing particular types of data;
- Challenges experienced by particular types of agencies in sharing data;
- Differences in IT infrastructure or data storage between agencies;
- How agencies overcame or attempted to overcome any identified barriers; and
- What resources agencies think would be helpful to overcome barriers.

What do PLMAs and transportation agencies need to share data more effectively?

This part of the research will focus on what resources and support PLMAs and transportation agencies need to engage in more successful data sharing partnerships. It will explore best practices and lessons learned from case studies, as well as feedback from the research panel and other sources.

The research project will explore:

- How to establish and maintain the mechanisms for data sharing (working groups, agreements, shared platforms, etc.);
- Existing opportunities to standardize transportation data to better share across agencies;
- Resources (e.g., funding, staff training, shared platforms) needed for data sharing partnerships; and
- The role regional and national agencies could play in facilitating data sharing.

Proposed Collection Methods

This study requires strategic and targeted use of literature (including PLMA and transportation agency publications, academic journals, and related documents), conversations with planning staff and technical experts, and analysis of existing data and tools.

Literature Review

The study began by investigating the why, how, and what high-level questions identified in the research statement and introduction section above. Using those questions as a framework, the study team conducted a literature review. The review process included key word searches in various databases and websites, including the Transportation Research Information Database (TRID), Western Transportation Institute resources, Federal Geographic Data Committee (FGDC), Transportation Research Board publications, U.S. Department of Transportation publications, FHWA plans and studies, State DOT and local agency research related to transportation on public lands, university research reports, and academic journals.

Through the literature review, the project team gathered information on data sharing partnerships with other types of organizations and the available tools to support these processes. The final literature review includes sections on the purpose and benefits of data sharing; challenges to data sharing; data management sharing processes; and a summary of previous PLMA and transportation agency planning and data sharing efforts.

Technical Research Panel (TRP)

The research team assembled a technical research panel (TRP) to ensure the study purpose, approach, findings, and deliverables align with project goals and public land management needs at key project milestones. The research team will facilitate up to eight TRP meetings throughout the research process. The TRP consists of participants from the following organizations or types of organizations:

- Bureau of Land Management
- Bureau of Reclamation
- City planning and/or department of transportation
- County planning
- Economic development agencies or organization
- FHWA Federal-Aid Division Office
- FHWA Office of Tribal Transportation and/or Bureau of Indian Affairs
- National Park Service
- Nonprofit parks advocacy or research organization

- Private planning or engineering practitioner
- State Department of Transportation
- Regional planning organization
- State or local parks and/or other land management department
- United States Forest Service
- University researchers
- United States Army Corps of Engineers
- United States Fish and Wildlife Service

The TRP is integral to the study, as participants have direct experience in the planning and data sharing processes that are the subject of this study. The TRP's primary purpose is to help guide the research process, and provide input and insight on the research team's progress.

The TRP will also be involving in identifying and selecting case studies. Members will help connect the research team to resources or contacts for case studies.

Database Research and Scan for Additional Data Sharing Examples

Beyond the literature review and recommendations from the TRP, the research team will scan for additional examples of data sharing between PLMAs and partners in various databases and transportation groups. Examples include:

- FHWA Road Safety Audits
- FHWA Transportation Management Area (TMA) Certification Reviews
- Relevant TRB committees
- Relevant research conducted by University Transportation Centers

Case Studies

The research team will also reach out to stakeholders to gather the information and data for case studies. These case studies will highlight how public lands management agencies and transportation agencies are using data sharing partnerships to achieve shared goals. These case studies will help examine best practices for partnerships to coordinate information/data sharing for planning, delivering, and managing transportation systems on and near public lands.

The methodology for conducting the case studies is as follows:

1. Establish case study selection criteria
2. Identify candidate case studies through database scans, TRP workshop, and broad "Call for Case Studies"
3. Develop final case study list per selection criteria
4. Develop case study method, format, and evaluation
5. Conduct outreach to case study subjects
6. Conduct case study discussions
 - a. Conduct interviews and workshops, including up to 10 site visits (as possible)
 - b. Review background materials
 - c. Map planning and data sharing processes
 - d. Conduct up to 10 site visits (as possible)
7. Synthesize cross-case study findings for Research Panel review

The information gathered from case studies may include, but is not limited to:

- Identification of common challenges that initiate data coordination efforts;
- Formation and maintenance of agency relationships;
- Data needs and innovations;
- Agencies involved;
- Tools and data platforms used;
- Application of data to project planning, selection, design, implementation, lifecycle management, and evaluation;
- Application of data to agency and user needs and travel patterns, including adaptive management of travel demand and public lands use;
- Lessons learned; and
- Results of collaborative data sharing efforts.

Case Study Selection Criteria

The TRP helped identify and define criteria for selecting case studies that cover the full range of examples discussed below.

Multi-Agency Involvement

The case studies should include a variety of types of agency involvement, such as:

- One-to-one data sharing examples;
- Data sharing that include three or more agencies;
- Open data sharing with an unspecified number of agencies; and
- Publicly-shared data.

These data-sharing relationships primarily include traditional transportation and public lands stakeholders, but they also may include other agencies, such as state-level environmental agencies, universities/research entities, non-profits, and private data providers. The research will cover the different data sharing policies and processes each of these types of agencies have, and how that influences their data sharing efforts.

Variety of Types of Data

The case studies should include a range of types of data, including not only traditional transportation data related to safety, traffic volume, transportation assets, or road ownership and maintenance, but also on cross-cutting topics like environment, resiliency, and equity. The examples should include multiple modes of travel. The case studies should include examples of sharing data that is easy to collect, as well as data that is less common or needs to be collected by innovative methods. The case studies should include both public and proprietary data. Finally, the case studies should include data in different forms, such as tabular, geospatial, longitudinal, and historic data.

Replicability

In order for case studies to be useful, they need to be replicable by other agencies. Case studies should provide an easy-to-follow roadmap for other agencies to implement similar data sharing efforts, with consideration given to agency policies, mechanisms for partnering, governance, project context, and costs. Case studies should highlight how agencies overcame similar challenges, and how identified gaps could be filled to better facilitate data sharing.

Diversity of Circumstances and Contexts

Case studies should apply across public lands with a variety of circumstances and contexts, such as:

- Examples in rural, suburban, and urban areas;
- Examples that are local and regional in scale;
- Examples with limited staff capacity and with trained staff;
- Examples that span a range of costs, including consideration of cost effectiveness;
- Examples that consider the range of transportation needs to and within public lands, including recreation, economic development, and community connectivity; and
- Examples with different agency goals for data sharing.

Different Project Phases

The case studies should include examples across different project phases, including those identified in Figure 1, which shows a generalized version of the transportation planning process. This process will be used as a starting point in case study discussions to understand agencies' transportation decision-making processes. Case study examples will include a focus on how data-driven decision making feeds into all elements of this process.

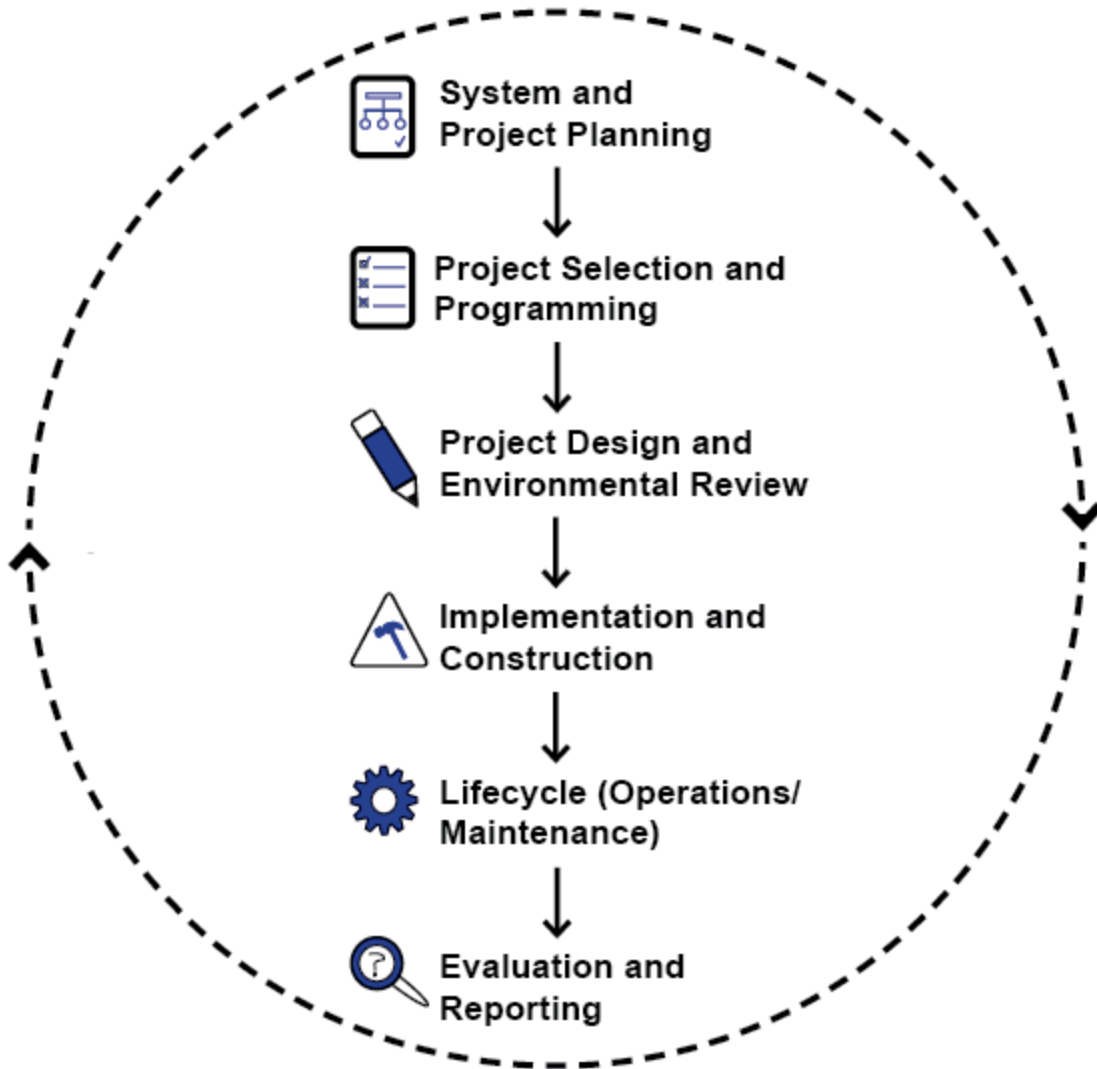


Figure 1: Generalized Transportation Planning Process

Case Study Assumptions

The project team makes the following assumptions related to the case study methodology.

Compliance with the Paperwork Reduction Act

The Paperwork Reduction Act (PRA) is a law that governs how the Federal government collects information from the public. This research is subject to the PRA, and the Volpe Center may need to seek Office of Management and Budget (OMB) approval for any survey or structured interviews of non-federal PLMAs and transportation partners. The PRA does not apply to collecting information from staff at Federal agencies.

Travel Restrictions

Due to restrictions on travel related to the Covid-19 pandemic, there will be limited opportunities for representatives of the research team to conduct site visits or attend in-person meetings. The project team will only travel if and when USDOT travel guidance allows travel and it is safe for both the project team and meeting participants. If necessary, the project team will hold meetings virtually in lieu of travel.

Recent Changes to Planning Processes

PLMAs and transportation partners may have recently modified their planning processes or their use of tools and resources due to impacts from recent events, including the Covid-19 pandemic and climate disasters. The Volpe Center will seek to understand how the planning processes and use of tools/resources have changed based on these impacts, and what additional tools/resources might help PLMAs and transportation partners in times of transition.

Transportation Planning Process as a Starting Point

This research focuses on data sharing partnerships between PLMAs and partners. The research assumes a “one-to-many” relationship, discussing how PLMAs can connect with various partners to achieve shared transportation goals. Within the PLMA context, the research primarily focuses on transportation planning but also considers data sharing to inform decisions throughout the transportation project lifecycle. Agencies have different flow charts to illustrate the transportation project lifecycle, or the transportation planning process. Figure 1 includes a generalized version of this process that is used as a basis for this research.

Schedule and Next Steps

The research study’s Data Collection and Analysis task includes three subtasks. The subtasks are listed below with their respective proposed timeframes and the initial next steps within each subtask.

- Data Collection: March 2021 to September 2021
 - Conduct case studies, with the following interim deliverables:
 - List of case study criteria and call for case studies
 - Matrix for case study selection
 - List of selected case studies
 - Case study key questions and approach
 - Field reports from each case study (including any resources shared by participants)
 - Draft case study chapter, including case study write-ups and preliminary findings/themes
- Data Coordination and Data Sharing Toolbox: July 2021 to October 2021
 - Develop a toolbox with the following information:
 - Data sharing forums, platforms, and practices;
 - Partnership structures and governance;
 - Plans, studies, or project delivery tools;
 - Existing tools, benefits and barriers, and how to use them in different settings, such as the Congestion Management Toolkit (NPS) and INSTEP (NPS);

- Emerging data sources, such as mobile location data and Bluetooth traffic and visitor trip data collection;
 - Data sharing platform tools, which may be used primarily outside of PLMA context currently or perhaps outside of transportation altogether;
 - Gap analysis for tools that do not currently exist and the context for their use; and
 - Application and context of tools identified, including clarifying contexts for tools and resources needed to operate tools.
- Findings: September 2021 to December 2021
 - Summarize key findings and other recommendations based on the data collection and data coordination/data sharing toolbox tasks.
 - Identify data coordination and sharing approaches that are most successful, how data coordination can be more effective, what steps can be taken to further advance mutually-beneficial coordination, and a best practices framework for state PLMAs and partners to adapt into their existing planning and project delivery processes.

Appendix A: Transportation Planning Data

Data that is critical to the transportation planning process are captured in Table 1. This list will be updated to reflect additional information gathered during the research process.

Table 1: Data Use by Type

Data	Type(s) ³	Example of Uses	Source(s)
Road network	Spatial	Origin-destination pairs	Departments of transportation (all levels)
Intersection nodes	Spatial	Modeling	
Crash data	Spatial, Tabular	Road Safety Audits	Law enforcement agencies
Demographic	Spatial, Tabular	Population density,	Census, state and local agencies
Bus stop nodes	Spatial	Transit Network analysis	Transit agencies, DOTs
Traffic volumes	Tabular	Measure congestion	FHWA, state and local DOTs
Train station nodes (all rail)	Spatial	Transit network analysis	Transit agencies, DOTs

³ Integrated Land and Water Information System
http://ilwis.itc.utwente.nl/wiki/index.php/Basic_concepts:_Spatial_and_tabular_data

Data	Type(s)⁴	Example of Uses	Source(s)
Watershed	Spatial	Geometric design	Environmental management agencies
Floodplain	Spatial	Infrastructure resiliency	Natural resource or environmental management agencies
Bridges	Spatial	Modeling	Departments of transportation (all levels)
Culverts	Spatial, Tabular	Infrastructure resiliency	Departments of transportation (all levels)
Trails	Spatial, Tabular	Non-vehicle networks	Natural resource or environmental management agencies
Bicycle Routes	Spatial, Tabular	Non-motorized vehicle networks	DOT (All Levels)
Pavement condition	Spatial, tabular	Long range planning	Departments of transportation (all levels)
Asset location	Spatial	Long range planning	Managing agencies
Deferred Maintenance	Tabular	Long range planning	Managing agencies

⁴ Integrated Land and Water Information System
http://ilwis.itc.utwente.nl/wiki/index.php/Basic_concepts:_Spatial_and_tabular_data