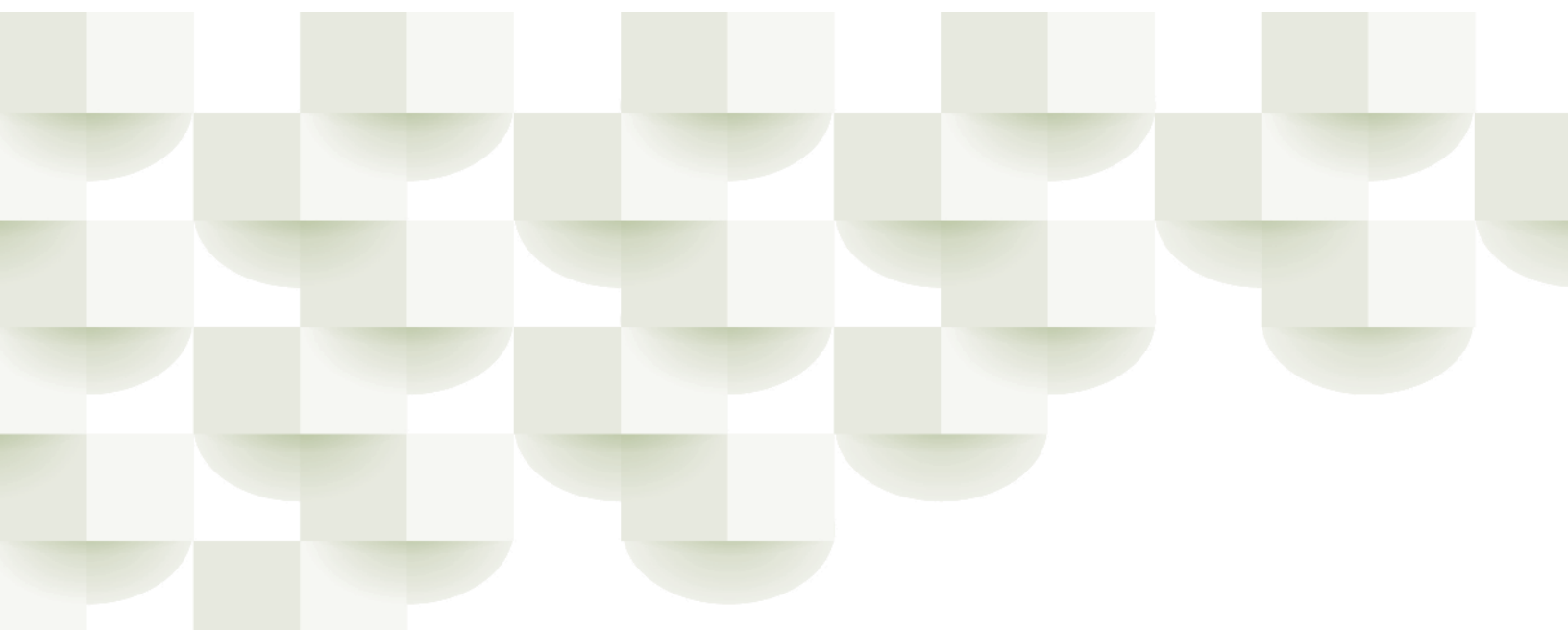


NCHRP

Research Report 1158

National
Cooperative
Highway
Research Program

Developing Snapshots for Transportation Planning



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NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Systematic, well-designed, and implementable research is the most effective way to solve many problems facing state department of transportation (DOT) administrators and engineers. Often, highway problems are of local or regional interest and can best be studied by state DOTs individually or in cooperation with their state universities and others. However, the accelerating growth of highway transportation results in increasingly complex problems of wide interest to highway authorities. These problems are best studied through a coordinated program of cooperative research.

Recognizing this need, the leadership of the American Association of State Highway and Transportation Officials (AASHTO) in 1962 initiated an objective national highway research program using modern scientific techniques—the National Cooperative Highway Research Program (NCHRP). NCHRP is supported on a continuing basis by funds from participating member states of AASHTO and receives the full cooperation and support of the Federal Highway Administration (FHWA), United States Department of Transportation.

The Transportation Research Board (TRB) of the National Academies of Sciences, Engineering, and Medicine was requested by AASHTO to administer the research program because of TRB's recognized objectivity and understanding of modern research practices. TRB is uniquely suited for this purpose for many reasons: TRB maintains an extensive committee structure from which authorities on any highway transportation subject may be drawn; TRB possesses avenues of communications and cooperation with federal, state, and local governmental agencies, universities, and industry; TRB's relationship to the National Academies is an insurance of objectivity; and TRB maintains a full-time staff of specialists in highway transportation matters to bring the findings of research directly to those in a position to use them.

The program is developed on the basis of research needs identified by chief administrators and other staff of the highway and transportation departments, by committees of AASHTO, and by the FHWA. Topics of the highest merit are selected by the AASHTO Special Committee on Research and Innovation (R&I), and each year R&I's recommendations are proposed to the AASHTO Board of Directors, the FHWA, and the National Academies. Research projects to address these topics are defined by NCHRP, and qualified research agencies are selected from submitted proposals. Administration and oversight of research contracts are the responsibilities of NCHRP.

The needs for highway research are many, and NCHRP can make significant contributions to solving highway transportation problems of mutual concern to many responsible groups. The program, however, is intended to complement, rather than to substitute for or duplicate, other highway research programs.

NCHRP RESEARCH REPORT 1158

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FOREWORD

By Jennifer Libby Weeks

Staff Officer

Transportation Research Board

NCHRP Research Report 1158: Developing Snapshots for Transportation Planning documents the process of developing four Snapshots of Planning Practices, concise and visually appealing documents that report on current planning practices in use by transportation agencies in four practice areas: Complete Streets, Data Sharing for Performance Management, Collaboration on Local Freight Delivery, and Economic Analysis to Support Decision-Making. This report will be immediately useful to transportation planners from state departments of transportation and other regional and local agencies seeking to incorporate or improve their transportation planning practices in the four areas covered by the Snapshots.

Transportation planning agencies and officials face a rapidly evolving technical, policy, legislative, and procedural environment. Agency professionals often seek the guidance of peers and experts to help them effectively address these challenges. Challenges include managing the demand for new transportation technologies and services within the confinements of existing streets, navigating the effects of growing e-commerce on travel patterns, managing resilience and risks, and implementing transportation planning in compliance with federal and state laws and regulations.

Under NCHRP Project 08-128, “Snapshots of Planning Practices,” Cambridge Systematics, Inc., developed four concise and visually appealing documents summarizing agency practices and listing resources for application in four transportation planning topic areas. The research process included completing a literature review as well as conducting surveys and interviews with agency stakeholders to develop practice vignettes and other resources to share with colleagues in the Snapshot documents. Interviews and a workshop with practitioners shaped the content details and the design of the Snapshot documents.

In addition to *NCHRP Research Report 1158*, *NCHRP Web-Only Document 431: Snapshots of Planning Practices* and an implementation plan are available on the National Academies Press website (nap.nationalacademies.org) by searching for *NCHRP Research Report 1158: Developing Snapshots for Transportation Planning* or *NCHRP Web-Only Document 431: Snapshots of Planning Practices*.



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Background

NCHRP Project 08-128, “Snapshots of Planning Practices,” reinitiates the concept of developing planning Snapshots with a focus on current and emerging topics in transportation planning. In general, planning Snapshots provide guidance and practical resources to transportation agencies and stakeholders so that they can address these topics and issues effectively and with the most up-to-date approaches and tools.

The four Snapshot topics included in this effort are Complete Streets, Data Sharing for Performance Management, Collaboration on Local Freight Delivery, and Economic Analysis to Support Decision-Making. These four topics represent current issues in transportation planning for state departments of transportation (DOTs) and municipal planning organizations (MPOs).

The focus of the four products are as follows:

- **Complete Streets:** Policies, methods, tools, and processes used by state DOTs and MPOs to accommodate different modal uses of the roadway and roadway rights-of-way.
- **Data Sharing for Performance Management:** Strategies, methods, processes, and procedures for identifying, adopting, and sharing specific data and planning performance metrics.
- **Collaboration on Local Freight Delivery:** Successful collaborations between state DOTs, MPOs, local governments, and private-sector freight providers to address the growing demands of goods movement.
- **Economic Analysis to Support Decision-Making:** Processes and tools used by state DOTs, MPOs, and local transportation agencies to assess and evaluate the economic value of transportation investments to inform decision-making.

NCHRP, in partnership with the AASHTO Committee on Planning, managed the original Snapshot series between 2013 and 2018 through NCHRP Project 08-36(120). These Snapshot products presented high-level information on current planning practices in areas such as integrated planning, innovations in long-range planning, freight planning, crash data, and connected and autonomous vehicles. The process for developing these products was focused on conducting and synthesizing practitioner surveys. Each Snapshot was prepared independently over a period of a few months.

During the NCHRP Project 08-128 revived Snapshot effort, the process involved researching all four topics at once; completing a literature review and series of interviews to identify effective practice and lessons learned; highlighting noteworthy practices for agencies at different points in the implementation process; and offering tips, resources, and key practices to support agencies in their planning decisions.

The overarching goal was to make each Snapshot a resource that can be relied on by practitioners and decision-makers. Additionally, instead of just offering a Snapshot of the topic practice area at one point in time, these Snapshots are designed to serve as a resource for advancement.

The renewed Snapshots offer levers of change and resources to provide agencies the information they need for realistic practice implementation and program advancement.

In support of that goal, the project's objectives were to:

- Produce four new Snapshots of Planning Practices to add to the series of initial Snapshots produced under prior work;
- Create visual and valuable research-based products that provide transportation agencies with a synopsis of who is doing what, why, how, and where on each Snapshot topic; and
- Establish implementable strategies and methods to ensure that the Snapshot series remains a visible and valuable product that reaches broad audiences.

This report summarizes work undertaken from September 2023 through January 2025 as part of Phase I and Phase II of this project. In Phase I of this effort, the research team conducted a literature review and practitioner outreach. These investigatory tasks informed the development of four draft Snapshot products. In Phase II, the research team continued to refine the Snapshot products based on practitioner and project panel feedback and developed an Implementation Plan for Snapshot publication and dissemination.

Research Approach and Findings

This chapter will describe Phase I of this project, which included gathering data on each Snapshot topic, assessing that data for application within Snapshots, and developing a consistent design and content template for each of the four Snapshot products delivered under this effort.

There were several iterative phases of content generation as part of this phase. Initial work produced a synthesis of practice documentation, which functioned similar to a review of literature. Following this synthesis, researchers engaged practitioners and stakeholders to determine the leading practices and how to develop a product that would be useful to the target audience. Finally, this information was used to produce proposed Snapshot content, which highlighted key examples of the practice.

Snapshot Literature Review

The purpose of the literature review was to gather, assess, and document existing research and resources on each Snapshot topic and to identify core needs, gaps, and best practices for further development. The literature review focused first on state DOT, MPO, and city and county research and best practices. As needed, the research team also incorporated resources and research from a variety of nontraditional practitioners. This review examined topical, timely research that could inform the practitioners to engage and the topics to cover in practitioner interviews.

For each Snapshot topic, the literature review presented the following information:

- **Key Practitioner Questions:** To determine what practitioners might be most interested in learning about through each Snapshot, the research team used online tools, Google Bard and Google Trends, to summarize search engine inquiries related to each topic area. This information provided information on potential focus areas or sections for later Snapshot content.
- **Topic in Practice:** To begin developing a list of potential agencies for outreach, this part of the literature review catalogued agencies implementing emerging practices in the field. The research team identified several potential case studies for further investigation and research. Case studies were identified based on:
 - Achieving a mix of state, regional, and local agencies operating in rural and urban communities, and
 - Achieving a mix of agencies of different relative sizes, program maturity, and funding and resource constraints.
- **Topic in Research:** To leverage current research on Snapshot topics, current research is summarized on each topic that informed subsequent tasks.
- **Next Steps:** Recommendations are summarized for practitioner engagement based on findings of the literature review.

After the literature review was completed, the research team requested feedback from the project panel to clarify the focus of each topic area and to recommend potential agencies or programs for engagement.

State of the Practice Assessment

The practitioner engagement undertaken as part of this project was designed to gain a better understanding of leading practices related to each Snapshot topic and to gather feedback on the content and design of the Snapshots. To reduce survey fatigue, engagement was focused on virtual fact-finding and direct conversations.

The project team engaged practitioners through a multifaceted approach that included focus groups, interviews, and outreach to committees and industry organizations. The first section of this summary is organized according to type of outreach conducted, which included the following:

- **Committee and Industry Organization Outreach:** Presenting to AASHTO groups and soliciting input on interviewees and thematic areas of focus. Interviewed representatives from the National Association of City Transportation Officials (NACTO) and the Association of Metropolitan Planning Organizations (AMPO) on all topic areas and gathered ideas for potential interviewees.
- **Focus Groups:** Convening two focus groups with practitioners and facilitating breakout groups organized around Snapshot topic area. The focus group invitation and interview guide can be found in Appendix A and Appendix B.
- **Interviews:** Conducting targeted conversations with key agencies in each topic area to gather input on leading practices as well as Snapshot form. The discussion guides for interviews can be found in Appendix C and Appendix D.

Committee and Industry Organization Outreach

The research team delivered a presentation on the project in two AASHTO forums. The team also met with representatives from AMPO and NACTO to identify leading organizations and practices for each Snapshot topic area. Table 1 summarizes that outreach.

Table 1. Summary of committee and industry organization engagement.

Date	Group Engaged	Description of Outreach
March 8, 2024	AASHTO: Committee on Planning Leadership—Presentation and Discussion	The research team developed a presentation and delivered an overview of the research effort to the AASHTO Committee on Planning—initially to the committee’s leadership team, and then to the full committee. The team used these opportunities to advertise the project and invite attendees to the upcoming focus groups. Meeting attendees were also invited to provide feedback on the project via email.
March 22, 2024	AASHTO: Committee on Planning—Presentation	
May 29, 2024	AMPO	The research team met with representatives from AMPO to discuss leading practices on all four Snapshot topics. This opportunity was used to identify notable practices in each Snapshot area and to discuss the different practices along the maturity spectrum. AMPO representatives identified multiple agencies, resources, and upcoming webinars that connected to the research focus.
June 17, 2024	NACTO	The research team met with the Senior Program Manager for Policy at NACTO to discuss leading practices on all four Snapshot topics. The conversation helped pinpoint difficulties that agencies face as they move along the maturity model, as well as examples of leading programs. The NACTO representative provided relevant resources, entities, and insight into each of the topics.

Focus Groups

To gather insights from industry leaders and practitioners, the research team organized two focus groups. Practitioners identified in the literature review but not selected for interviews were invited to these focus groups. Additionally, the research team engaged with applicable committee leaders from TRB and AASHTO to distribute invitations. The invitation included a registration survey that participants could use to indicate the Snapshot topic they were most interested in discussing. This information guided the creation of breakout groups, which allowed for more focused conversations on each topic. The invitation for the focus groups and the discussion guide used to support the breakout groups can be found in Appendix A and Appendix B, respectively.

The focus group meetings began with a brief presentation and overview of the research topics. Participants were then split into two breakout groups based on topic. In total, the research team contacted 72 individuals or agencies for participation, resulting in two focus groups with 25 participants in total. Table 2 summarizes the organizations represented at each meeting.

Key Focus Group Takeaways

The following subsections summarize takeaways from the focus groups by topic area. The only topic not discussed explicitly during the focus groups was economic analysis. The research team found that few participants were interested in this topic on its own, but many were interested in its relation to other topics (e.g., economic measures as they relate to Complete Streets or freight movement).

Complete Streets Implementation

Participants highlighted key challenges related to Complete Streets implementation and examples of leading practices. Implementation challenges occur when:

- There is a state road that is designed for higher-speed traffic but also has destinations that need to be served by transit. This is also a safety concern.
- There is a need to justify Complete Streets' economic impact because of the ongoing maintenance implications of these projects.

Table 2. Focus group dates and attendees.

Date/Time	Organizations Represented	Attendees by Topic
3/26/2024 11:00 a.m. ET	<ul style="list-style-type: none"> • Atlanta Regional Commission • Colorado DOT • FHWA Office of Planning • Florida DOT • Future Planning Consulting • ICF International • Maricopa Association of Governments (MAG) • Ohio DOT • Urban Freight Lab (WA) • West Piedmont Planning District (VA) • Virginia DOT • Virginia Transportation Research Council 	<ul style="list-style-type: none"> • Complete Streets: 7 • Data Sharing for Performance Management: 4 • Collaboration on Local Freight Delivery: 4 • Programmatic Economic Measures to Evaluate and Prioritize Transportation Projects and Investments: 0
3/27/2024 1:00 p.m. ET	<ul style="list-style-type: none"> • FHWA • HDR, Inc. • Kansas DOT • Minnesota DOT • North Carolina DOT • Oregon Metro • Port of Oakland • Virginia DOT • Washington State DOT 	<ul style="list-style-type: none"> • Complete Streets: 3 • Data Sharing for Performance Management: 2 • Collaboration on Local Freight Delivery: 3 • Programmatic Economic Measures to Evaluate and Prioritize Transportation Projects and Investments: 2

- There is a need to create bike lanes that are safe and appealing to cyclists and accommodating to people with disabilities.

One participant noted that transportation professionals can build relationships with local health partners to talk about Complete Streets in terms of public health.

Leading Complete Streets practices identified during the focus groups include those detailed in the Minnesota DOT (MnDOT) Complete Streets guide (MnDOT n.d.-a) and Complete Streets Transportation Hierarchy Tool (MnDOT n.d.-b), the Washington State DOT (WSDOT) legislative Complete Streets mandate (WSDOT 2023) and Washington State Complete Streets statute (Washington State Legislature 2022), and the Florida DOT (FDOT) Context Classification Guide (FDOT 2022).

Data Sharing for Performance Management

Participants noted that mapping tools should be used as a central repository for multiple data sources to create one accurate source. Examples of mapping tools and initiatives highlighted by participants include the Sun Cloud Explorer [Maricopa Association of Governments (MAG) n.d.], the Virginia freight plan interactive map (VTrans n.d.), the Philly Freight Finder [Delaware Valley Regional Planning Commission (DVRPC) n.d.], and the Atlanta Regional Commission Freight Cluster Plans (Atlanta Regional Commission n.d.).

In terms of data collection and sharing, participants mentioned data sources such as individual stakeholders (e.g., rail carriers) but highlighted the need for data from the private sector, businesses, and local stakeholders. Participants also expressed a need for data sharing agreement templates, resources to determine estimates and impacts of freight projects, and data-sharing and analysis performance methods. For successful partnerships, DOTs must be able to easily share data with MPOs and other entities.

Collaboration on Local Freight Delivery

Practitioners focused on leading practices in the freight industry and on the overlap of freight delivery with data sharing and Complete Streets. Practitioners feel they have a limited view of freight industry activity. Data resolution is not currently fine enough to assess local delivery, and obtaining better data will likely require enhanced stakeholder involvement. Key stakeholders to engage include carriers like United Parcel Service (UPS), FedEx, Amazon, less-than-truckload carriers, and utilities (power companies, plumbers, etc.) with large vehicles.

A participant from the Port of Oakland marine terminals explained how the port presents an end-to-end use for customers by tracking freight metrics through staff input and cameras (Port of Oakland n.d.). Similarly, the city of Portland's newly updated freight plan is unique in that it looks at measures for curb usage and availability, especially in the central commercial district (Portland Bureau of Transportation 2023).

Practitioners also discussed the overlap between Complete Streets and freight delivery. One participant noted that their agency reaches out to developers and stakeholders in walkable urban areas to ask how they are considering freight movement.

Interviewee Selection

The literature review informed the selection of an initial set of interviewees. The research team's goal was to speak with two to three individuals in each audience category (e.g., state DOT, MPO, city) for each topic. These interviewees were identified based on a few characteristics:

- Association with innovative practices identified in the literature review
- Feedback from subject-matter experts and the project panel
- AASHTO and TRB committee outreach

During the interviews, participants offered further recommendations for agencies they considered leaders in one of the four topic areas. This resulted in additional interviews being conducted for each topic area. The initial list of interviewee recommendations and interviews that were completed can be found in Table 3. Additional interviewees were identified by people interviewed during the first round or from the project panel. A prioritized list of interviewees by Snapshot topic as they were presented to the panel is summarized by topic in Appendix E.

Practitioner Interview Takeaways

Initially, the research team determined an interviewee list from the results of the literature review for each Snapshot topic. The initial round of engagement resulted in eight agencies identified for interviews and seven interviews scheduled. After the initial round of engagement, additional leading agencies were identified through past practitioner interviews and through focus group feedback. As a result, the research team scheduled several additional conversations to gather more information. Each of the practitioner interviews by topic area is listed in Table 3.

Complete Streets

The research team conducted interviews with representatives of Arlington County, Virginia, on March 19, 2024, the Metropolitan Transportation Commission (MTC) on April 9, 2024,

Table 3. Initial interviewee recommendations and completed interviews.

Interviewee Recommendations	Completed Interviews
Complete Streets	
Arlington County Virginia	Arlington County, Virginia
Bay Area Metropolitan Transportation Commission (MTC)	MTC
MnDOT	Kansas DOT
New Jersey DOT	Michigan DOT
Ohio DOT	
Oregon Metro	
Data Sharing for Performance Management	
City of Atlanta	DVRPC
City of Cincinnati	MnDOT
Iowa DOT	Michigan DOT
NACTO	Utah DOT
Open Mobility Foundation	
The Eastern Transportation Coalition	
Utah DOT	
Collaboration on Local Freight Delivery	
Atlanta Regional Commission	MAG
Colorado DOT	Michigan DOT
District of Columbia DOT	NYC DOT
MAG	Seattle DOT/Urban Freight Lab
NJ Office of Planning Advocacy	Virginia DOT
New York City (NYC) DOT	
Seattle DOT	
Texas DOT	
Programmatic Economic Analysis to Evaluate and Prioritize Transportation Projects and Investments	
Atlanta Regional Commission	Broward MPO
MTC	Michigan DOT
Broward MPO	Ohio DOT
Kansas City DOT	
Ohio DOT	
Port of Oakland	
Texas DOT	
Virginia DOT	

Kansas DOT on May 3, 2024, and Michigan DOT on June 6, 2024. Table 4 summarizes findings from these conversations.

Data Sharing for Performance Management

The research team conducted an interview with representatives of Utah DOT on March 28, 2024, MnDOT on May 7, 2024, Michigan DOT on June 6, 2024, and DVRPC on June 7, 2024. Table 5 summarizes findings from these conversations.

Table 4. Complete Streets—interview summaries and findings.

	Leading Practices	Key Takeaways
Arlington County, Virginia	<ul style="list-style-type: none"> Arlington County's Neighborhood Complete Streets Program evolved from its Neighborhood Traffic Calming Program. The Traffic Calming Program initiated some projects that sparked neighborhood opposition; this new program, which involves a neighborhood commission, is designed to address these and other Complete Streets–related dynamics. The program represents a multimodal approach toward Complete Streets that goes beyond simply lowering speeds. After being evaluated based on a data-driven prioritization matrix, projects are evaluated by the five-member Neighborhood Complete Streets Commission. Once projects are approved, there is a Six-Step Public Engagement Guide that the program uses to communicate with the community about the project. The program issued its first call for projects in 2017 and received 350+ applicants. Since the first projects were funded in 2020, the program as allocated or spent \$4.25 million on neighborhood projects. There are nine pilot projects ongoing. In the future, Arlington County sees opportunities to increase the backgrounds, experiences, and perspectives within the Neighborhood Complete Streets Commission and to develop more clearly defined project scoring processes in key focus areas. 	<ul style="list-style-type: none"> Divesting small local projects to the advisory groups like the Neighborhood Complete Streets Commission can help agency boards operate more efficiently and engage community members in planning processes. The pilot projects may be a repeatable model for cities with similar challenges (e.g., lack of pedestrian infrastructure and space constraints). A key challenge is data collection, specifically around traffic counts. There are regulatory barriers to Complete Streets implementation. There are acute challenges to obtaining additional right-of-way. Arlington County would be interested in hearing more about how agencies manage institution gridlock.
MTC	<ul style="list-style-type: none"> MTC had one of the first regional Complete Streets policies (established in 2006). This policy worked to advance Plan Bay Area 2050 objectives of achieving state and local compliance with applicable laws, policies, and standards, including the California Complete Street Act of 2008. MTC adopted a new policy in 2022 that called for all projects funded all or in part with regional discretionary funding or receiving MTC endorsements to adhere to the Complete Streets policy. This includes: <ul style="list-style-type: none"> All projects must implement the Complete Streets policy as recommended in local and countywide plans. Projects on the Active Transportation Network must incorporate design principles based on the “All Ages and Abilities” contextual guidance (NACTO 2017). MTC adopted these “design principles” rather than “design standards” to allow flexibility among implementing agencies. As part of this update, a Complete Streets checklist process is required for all projects with a total project cost of \$250,000 or more. The checklist is a form to help ensure local compliance with Complete Streets policy and applicable laws. MTC's broad goal is to ensure regional policy alignment; in funding projects, MTC looks to fund those that meet the One Bay Area goals. 	<ul style="list-style-type: none"> MPOs can use policy and funding mechanisms to significantly increase the number of Complete Streets projects in a region. Identifying a priority Complete Streets network for project funding helps ensure alignment across organizations. Pairing a Complete Streets policy with the regular transportation plan updates allows MTC to simultaneously update the policy and mechanism. Pulling from DOT, town, and city planning documents allows MPOs to avoid continuously reinventing the wheel. Hiring community-based organizations to gather input for Complete Streets policy ensures alignment with preexisting networks, plans, and relationships. MTC representatives indicated that they wished they had instituted performance reporting metrics and requirements prior to project funding to ensure their ability to accurately track progress and progress impact.

Table 4. (Continued).

	Leading Practices	Key Takeaways
Kansas DOT	<ul style="list-style-type: none"> While Kansas DOT is in the scoping phase of its Complete Streets program, the agency has implemented multiple strategies around Complete Streets implementation. Once the program is implemented, Kansas DOT will likely call the initiative the Safe Streets Program instead of a Complete Streets program. Kansas DOT has developed a geographic information system (GIS) layer of known preferred routes for cyclists (the “Priority Route Network”) and implemented a process wherein projects overlapping this layer must undergo additional evaluation of shoulder width. The state encourages local department to apply for Safe Streets funding and established an initiative where the state will match all Safe Streets and roads for all applications funds. This program was so successful that the state began matching all discretionary funding. Kansas DOT established the “Kansas Infrastructure Hub” and the “Built Kansas Fund” to provide technical assistance for applications. Kansas DOT also offers post-application support. Kansas DOT’s Local Roads Safety initiative was an effort to encourage (with the aid of state funding) all 105 counties in Kansas to develop a local roads safety plan. In support of this effort, Kansas DOT developed an active transportation planning toolkit for small- and mid-sized communities. 	<ul style="list-style-type: none"> Before formalizing its Complete Streets program, Kansas DOT worked to implement multiple Complete Streets programs and initiatives, and this has set up its future Complete Streets program for success. Agencies may want to consider alternative branding to “Complete Streets” for their programs. Kansas DOT had multiple champions of its Complete Streets initiatives—from the governor to Kansas DOT staff. It is important for champions to advocate for Complete Streets initiatives and implementation within an organization. The state is committed to funding projects across the state, and Kansas DOT has developed multiple resources to support local agencies in application development and project implementation.
Michigan DOT	<ul style="list-style-type: none"> Michigan is currently working on updating its Complete Streets design guidelines to allow for more flexibility in implementation. Michigan DOT is now looking at larger scale corridor plans for Complete Streets implementation. 	<ul style="list-style-type: none"> Flexibility in design guidelines at the state level can help cities and MPOs implement the programs in a way that fits their needs. Identifying key corridors at many scales can help create a connected Complete Streets network.

Table 5. Data sharing for performance management—interview summaries and findings.

	Leading Practices	Key Takeaways
Utah DOT	<ul style="list-style-type: none"> Utah DOT’s UPlan is its central hub for GIS data and applications. Utah DOT did not have a GIS resource before UPlan. With this tool, Utah DOT hoped to proactively identify potential issues early in the planning process as they emerged and to eliminate alternatives sooner. Utah DOT has undergone two rounds of a data-driven development process, leveraging readily available and real-time data whenever possible. The UPlan performance measures data portal equips Utah DOT and state MPOs with the tools to visualize and analyze data. This platform supports MPOs in meeting necessary requirements, including those mandated by FHWA. In target development, Utah DOT prioritizes transparency to ensure MPOs understand the target-setting process and have data access. While MPOs have the flexibility to set their own targets, they typically use the Utah DOT system. 	<ul style="list-style-type: none"> Data maintenance is labor intensive. Utah DOT noted that it was important to clearly identify maintenance responsibilities within the department and to sufficiently staff these roles. A significant accomplishment of UPlan has been fostering collaboration with other agencies that share their data with Utah DOT and develop trust. An additional functionality Utah DOT would like to develop is the ability to analyze data in GIS beyond just representing it on a map. For example, this could be used to determine the impact of a project on access to jobs.

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Table 5. (Continued).

	Leading Practices	Key Takeaways
	<ul style="list-style-type: none"> • In addition to sharing externally, UPlan has also become an internal data hub, allowing data dissemination within Utah DOT that goes beyond spreadsheets and databases. • Utah DOT is currently working to establish data governance standards through a data management plan. The objective is to identify data sets that are historical, personal, or official to create a single point of access. The Statewide Asset Manager has led this data governance effort in coordination with Utah DOT's head of IT and a consultant. • Responsibility for managing a large and complex system like UPlan is dispersed, which is why delineating responsibilities is crucial. Utah DOT has at least 20 staff members that work on UPlan in addition to a core staff of six individuals who oversee GIS agency-wide. 	<ul style="list-style-type: none"> • Utah DOT would like information on how other agencies measure success of online tools (e.g., measuring how many people are using them or the level of user experience) and how they make determinations around key data issues (e.g., data usage and storage). • Utah DOT also highlighted the work of Wasatch Front Regional Council and its data hub, which is available for public use.
MnDOT	<ul style="list-style-type: none"> • MnDOT produces annual scorecards to track performance on the transportation system, Minnesota Transportation Reports, and a Transportation System Performance Report for the state legislature. • In 2016, MnDOT published the Performance Measure Dashboard, an online tool that shows annualized data visualization and mapping under eight performance topics. MnDOT's Minnesota 511 online, open-data portal provides readily available information on transportation conditions, such as road reports, critical disruptions, lane closures, and weather conditions. • While MnDOT performs some interagency data collection, data are primarily sourced from external partners. MnDOT has data governance initiatives and domain stewards in place, but its partners are also responsible for data governance and quality control procedures. • MnDOT has experienced challenges in connecting the data to the dashboard in real time. Data must be reviewed and analyzed before they are uploaded into the dashboard. Furthermore, MnDOT does not always have direct access to the data warehouses, which makes it increasingly challenging to update the dashboard efficiently. 	<ul style="list-style-type: none"> • Data collection and maintenance are often time consuming and resource intensive. Despite these challenges, it is important to distribute data in multiple formats to reach as many audiences as possible (e.g., dashboard, static reporting). • Data-sharing tools can be used to respond to a crisis in real time. MnDOT resources provided the public and stakeholders with easily accessible information during a 2007 bridge collapse. • The data are often further away than they seem. MnDOT does not always have direct access to the data warehouses, which makes it increasingly challenging to provide updates efficiently. This causes a delay from the time the data are gathered to when they are displayed on the dashboard/report. • MnDOT aims to improve its transportation measures to better address local needs without compromising efficiency.
Michigan DOT	<ul style="list-style-type: none"> • Michigan's Transportation Asset Management Council (TAMC) has a robust system in place for collecting and sharing pavement and bridge data for performance management. • There is not a mature program in place for collection of active transportation data; there are generally fewer resources available to do this. 	<ul style="list-style-type: none"> • Data sharing for some types of data can be easy, especially where there are already systems in place to do so.
DVRPC	<ul style="list-style-type: none"> • DVRPC's Philly Freight Finder is an interactive freight mapping and data platform that displays regional freight data. • The tool was first developed using Strategic Highway Research Program 2 grant funds, and it was required to be open-sourced. The code for the original Philly Freight Finder is publicly accessible through GitHub. • Over time, the tool has evolved and developed into a multi-tool platform including county freight profiles, maritime performance indicators, and links to downloadable data. • DVRPC works in close collaboration with its freight advisory committee, the Delaware Valley Goods Movement Task Force, to determine stakeholder needs and consult with freight advisors as the platform evolves. • DVRPC collects multiple data sources to feed into the platform: publicly available data sets, data sets developed within the agency, and one-time purchased data. 	<ul style="list-style-type: none"> • Data management can be challenging, and it is difficult to frequently update the platform. Once the data are collected, they must be cleaned, aggregated, and joined across datasets before they can be used in the tool for performance management. • In the future, DVRPC would like to further develop the platform through process automation by directly connecting the platform to the agency data portal and implementing automatic updating. Additionally, there may be an opportunity to add features, such as the option to search for an address in the tool.

Collaboration on Local Freight Delivery

The research team interviewed planners from MAG on March 20, 2024, New York City DOT on April 9, 2024, Michigan DOT on June 6, 2024, and Seattle DOT/Urban Freight Lab on August 22, 2024. Table 6 summarizes findings from these conversations. The team also interviewed Virginia DOT on April 24, 2024, but found that there was not substantial overlap between the Snapshot topic and Virginia DOT's activities.

Programmatic Economic Measures to Evaluate and Prioritize Transportation Projects and Investments

The research team met with representatives from Ohio DOT on March 20, 2024, Broward MPO on March 25, 2024, and Michigan DOT on June 6, 2024. Table 7 summarizes findings from these conversations.

Table 6. Collaboration on local freight delivery—interview summaries and findings.

	Leading Practices	Key Takeaways
MAG	<ul style="list-style-type: none"> MAG's most pressing challenges related to local freight delivery involve truck parking availability. Within MAG's member region, there are diverse community and truck parking needs. MAG has undertaken a few efforts to address needs on this topic: <ul style="list-style-type: none"> Truck Parking Best Practices Study: MAG examined peer cities to gain insights into the industry and identify best practices. Freight Subarea Project Assessments: These studies pinpoint engineering solutions to better accommodate trucks and establish freight corridors. They also include public outreach and engagement with stakeholder groups, including MAG contacts, member agencies, and freight companies. Partnership with Arizona DOT: MAG collaborates closely with Arizona DOT, and there is a plan for specified partners to engage on truck parking issues. MAG plans to dive deeper into those partnerships with the next round of funding. MAG also noted that in Arizona, each city and town manages its zoning independently, and MAG lacks regional land-use authority. For this reason, partnerships and active communication are crucial for its initiatives. 	<ul style="list-style-type: none"> In fast-growing areas with many abutting industrial and residential areas, there may be truck parking challenges that create issues for freight movement. In the future, MAG sees opportunities to collaborate with private developers, regional agencies, trucking associations, and state advocacy groups (including multimodal) on truck parking issues. Currently, there is room to grow in terms of collaboration. In terms of Snapshot content and form, MAG is interested in accessing the raw data behind any statistics presented. Having the opportunity to follow links to additional resources is immensely useful.
New York City (NYC) DOT	<ul style="list-style-type: none"> NYC DOT's Off-Hour Delivery Program (OHD) started as a pilot in 2009. NYC DOT partnered with 30 businesses that agreed to deliver during off hours and install trackers to the delivery vehicles to track traffic and delivery metrics. The 1.5-year pilot generated benefits including a reduction in daytime congestion, reduced interactions with vulnerable road users, and cost savings for receivers and transporters. NYC Economic Development Corporation has since worked to expand and institutionalize this program. In 2019, it reached the goal of 500 businesses and officially launched the program citywide. In recruiting voluntary participants, DOT pitched businesses on the increased certainty of truck arrival time, reduced delivery times, reduced need to engage with deliveries during peak customer hours, and decreased delivery costs. NYC DOT has pivoted to incentivizing participation to expand the program's reach and participation. In 2024, it began using \$6 million in Congestion Mitigation and Air Quality funding for an incentive program. Funding will help small businesses participate that do not have resources or infrastructure to support off-hour deliveries. 	<ul style="list-style-type: none"> Programs like OHD can encourage participation by offering financial incentives. Transporters are the parties most likely to immediately see the benefits of programs like OHD. The receivers have been the more challenging group to sell on making changes to delivery hours. This program was supported through broad and early engagement with businesses that were receivers. NYC DOT also strategically targeted early participants based on those with existing sustainability commitments or engagement. Related programs can also drive participation in programs like OHD. For NYC DOT, the advent

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Table 6. (Continued).

	Leading Practices	Key Takeaways
	<ul style="list-style-type: none"> Noise complaints have emerged as a central challenge to this effort. NYC DOT has collaborated with the Department of Environmental Planning to manage these complaints. In response to this issue, NYC DOT has released a noise toolkit with recommendations for receivers, transporters, and residents on reducing noise. Data sharing is another challenge. Broadly, freight companies are wary of sharing potentially competitive data. NYC DOT has entered into sole-source agreements with private-sector transporters but continues to experience challenges around data quality. Off-hour delivery is just one tool NYC DOT is implementing to improve freight delivery. The agency is also exploring utilizing cargo bike operators, activating waterways to deliver freight, curb management, and building micro-hubs and secure lockers to increase delivery efficiency and security. 	<p>of congestion pricing has already driven interest in OHD because tolls are lower in off-peak hours. Additionally, some revenue from congestion pricing will be used to fund further OHD participation incentives.</p> <p>In terms of Snapshot content and form, case studies are the most useful. New York City looks outside of the United States for many of its case studies; staff noted practices in London and Montreal that were used to model the OHD Program.</p> <ul style="list-style-type: none"> NYC DOT would appreciate being able to connect with other cities and share ideas, potentially through a cohort of peer agencies. C40, a global network of mayors who are collaborating to reduce their cities' emissions by 50 percent by 2030, provides a resource for connecting and sharing resources with peer agencies on some topics.
Michigan DOT	<ul style="list-style-type: none"> Michigan DOT is integrating its Freight Plan into its Long-Range Transportation Plan. Michigan DOT recognizes the joint focus of these plans on providing safe and accessible transportation for non-motorists and prioritizing movement of goods. Michigan DOT has asked how it can support placemaking in local communities while also achieving freight delivery. 	<ul style="list-style-type: none"> This combination is innovative. The Long-Range Transportation Plan has not moved beyond the planning phase but has set goals and precedents. The integration of the Freight Plan and the Long-Range Transportation Plan shows the importance of local freight delivery and the need to mitigate the impact on local communities.
Seattle DOT/Urban Freight Lab	<ul style="list-style-type: none"> The Open Mobility Foundation, Urban Freight Lab, and the Seattle DOT received a \$2 million grant for curbside management digitization, which they used to launch the Urban Freight Lab's Last Mile Freight Curb Access Program. This program is designed to change commercial vehicle driver behavior and promote responsible curb use by providing them real-time information. They are leveraging academic partners for their analytical capabilities, research, and outreach. These third-party partners could be better positioned to engage with freight carriers or other private operators. Coordinating with Complete Streets work ensures that loading zones and other project designs are aligned. Outsourcing elements of their data collection has allowed them to collect specific granular parking and traffic data that are needed for their curb digitization. 	<ul style="list-style-type: none"> They have used nontraditional partnerships, such as with hospitality associations and automakers, to support their work. Gaps remain in their understanding of how third-party delivery vehicles (e.g., food delivery services, building services) use the curb. They have identified differences in the use of the words "parking" and "loading zones" that can lead to confusion.

Table 7. Programmatic economic measures to evaluate and prioritize transportation projects and investments—interview summaries and findings.

	Leading Practices	Key Takeaways
Ohio DOT	<ul style="list-style-type: none"> Ohio DOT is in the process of developing a strategic transportation and development analysis. This analysis will be used for a statewide study of the Ohio transportation system in collaboration with the Department of Development and the Governor's Office of Workforce Transportation. This effort emerged from the governor's mandate that Ohio DOT engage and develop an analysis that aims to answer the question: "How can the transportation system further support economic growth?" A statute has required analysis of two corridors in the state, but Ohio DOT is currently studying over 50. This project will identify opportunities to support economic development, analyze demographic information to predict growth, identify major economic centers, evaluate workforce trends, develop forecasts for passenger and freight demand over multiyear periods, and identify economic growth opportunities such as corridor improvements. The goals are to use growth models to better understand insights into access control and risks around interregional trade routes, and to delineate responsibilities between Ohio DOT and regional planners. Additionally, the agency hopes to move toward more project-based planning. 	<ul style="list-style-type: none"> This unique analysis helps Ohio DOT identify opportunities for the transportation system to support economic growth in the state. Ohio DOT collaborates in this effort with the Department of Development and the Governor's Office of Workforce Transformation, and there is a high level of engagement from state leaders. Their investment in the project can sometimes be challenging, but overall, it is helpful to have buy-in from leadership. Ohio DOT identified Utah DOT and MnDOT as other national leaders in this area. As far as Snapshot content, mixed media with embedded links to other content is ideal. The National Highway Institute provides a model for developing engaging electronic learning content.
Broward MPO	<ul style="list-style-type: none"> Broward MPO has integrated a 10-point scale of economic vitality into its project prioritization process. The criteria consider factors such as freight and goods movement, state of good repair, and a project's location relative to an activity center. Broward MPO uses a high-level evaluation system to streamline project prioritization rather than using a complex equation for economic impact assessment. This approach aims to ensure transparency and ease of communication with the MPO's committee and board members. Additionally, the citizen advisory committee, technical advisory committee, and MPO board are given the opportunity to provide feedback. Broward MPO has experienced challenges and limitations related to data availability. It has worked with business data in the past and found that the granular data provided are not useful; it needs macroeconomic data, which are not as readily available. The state of Florida provides information, and Broward is looking into other data sources, but there is not a clear solution. 	<ul style="list-style-type: none"> Broward struggles with data availability across projects, especially in terms of macroeconomic data. Broward MPO also shared insights related to economic measures for Complete Streets. One factor it considers is real estate prices. The economic impact of Complete Streets is difficult to capture though, and it wants to increase tracking for employment, sales, development, and redevelopment. Without quantitative data, it has to rely on qualitative data such as before-and-after images. Broward highlighted the need to explain the process to nontechnical community members through resources such as the Complete Streets Toolkit and community bike rides. In terms of Snapshot design/dissemination, Broward MPO prefers webinars and highly designed PDFs that highlight leading agencies.
Michigan DOT	<ul style="list-style-type: none"> Michigan DOT utilizes TREDIS, an economic analysis tool, to develop a multimodal economic benefit analysis system. TREDIS calculates the economic impacts as well as the benefits and costs of proposed projects, programs, and policies. Michigan DOT is currently in the development phase with this tool, but over time hope to use it for project prioritization and implementation. In developing the tool, Michigan DOT has integrated data from across departments (e.g., from the aeronautics database tool and transit system value tool), which enables staff to use a common data source. Michigan DOT has an ongoing research effort to develop the Multi-Objective Decision Analysis (MODA) tool. A long-term goal is to regularly integrate economic benefit analysis into the decision-making process. Michigan's long-range transportation plan includes its Freight Plan and its Active Transportation Plan, which serves as a useful opportunity to convene a range of stakeholders. Michigan DOT is actively considering the trade-offs between local placemaking and freight delivery needs. 	<ul style="list-style-type: none"> Development of software/tools can be time intensive and expensive. In Michigan DOTs case, it was important for maintaining leadership buy-in that modal divisions actively advocated for the project. Even using the TREDIS tool, Michigan DOT anticipates it will be too expensive and time intensive to evaluate economic benefits at a project level. Michigan DOT would like to learn more about the resources and staffing necessary to be a leading organization on this topic. In terms of these Snapshots, Michigan DOT hopes to learn more about the nuts and bolts of how other DOTs and MPOs are evaluating economic measures and approaching prioritization and how many resources these efforts require within an organization.

Overall Engagement Findings

Information collected through practitioner interviews and focus group discussions yielded several key conclusions regarding Snapshot content and design:

- **Practitioners prefer simple, visual content with external links:** Practitioners want resources that summarize topics at a high level in a visually engaging but simple manner. Practitioners likened the Snapshots to the function of executive summaries in reports; those summaries are easily digestible and give readers enough information to be informed but not overwhelmed. Practitioners also noted that they wanted these simple visual products to offer readers the opportunity to learn more; links to external content, raw data, maps, and other supporting documentation are appreciated.
- **Practitioners want resources that offer solutions for different types of agencies:** There is a desire to see a range of options highlighted in the Snapshots so that any agency—regardless of urban or rural context, agency resources and capacity, or other factors—can engage in some part of the Snapshot’s findings. It was suggested that different Snapshots be developed for different audiences. At the very least, they should convey the extent to which more cutting-edge practices could be implemented on a smaller scale in another state, city, or region.
- **Practitioners want help sifting through resources and guidance:** Practitioners noted that there is already a great deal of guidance available on all the Snapshot topics. What would be most helpful would be to create a repository of the more authoritative sources of guidance rather than a new guidance document itself. This approach could be described as a “curated list of resources.”
- **A key feature of dissemination should be webinars and training:** Practitioners often attend webinars and training, and these would be useful forums for distributing information on the Snapshots. The American Planning Association, various industry committees and groups, and FHWA community planners might also be other resources for getting the word out.

Based on these takeaways, the research team developed a set of Snapshots that offer building blocks along a spectrum of resources, practices, and leading examples. The organizing principle for this spectrum was a maturity model to describe the evolution of a person or group over time, mapping capabilities to different maturity levels. The interviews and focus groups provided many different practice examples that could have been used for the case studies. The final case studies were chosen by selecting practices or programs that showed exemplary practices across a range of agency scales, maturity levels, and program designs. This method allowed the Snapshots to present a diversity of case studies with the goal of allowing users to see an agency similar to theirs reflected in the case studies.

Analysis of Sample Formats

In a memorandum, the research team investigated characteristics and design options related to the maturity model and building-block concepts. First, the research team examined existing approaches for developing maturity models. Maturity models generally describe the evolution of an organization over time, mapping capabilities to different maturity levels. This framework provides a tool for assessing current capabilities and understanding how a person or group can move to a subsequent maturity level. Originally developed to improve software development processes, different maturity models are now used across a range of industries and organization types. The following list identifies several maturity models that are commonly used today:

- **Capability Maturity Model (CMM):** The CMM is a process of identifying the current condition and how to move the product to the next specified level. The CMM grew out of the Software Engineering Institute and was developed to assess process maturity levels in software.

- **Capability Maturity Model Integration (CMMI):** CMMI was an effort out of the Software Engineering Institute to improve on weaknesses of the CMM model. CMMI considers process maturity more broadly and adopts a results-oriented approach toward key performance areas. CMMI is usable by industries besides the software industry.
- **Business Process Maturity Model (BPMM):** The BPMM framework further builds on the CMMI model. Specific to BPMM are Domain Process Areas, which describe the types of new measures that should be taken to lift the organization to the next maturity level.
- **People Capability Maturity Model (PCMM):** This model aims to assess the maturity of an organization's workforce practices to integrate workforce development into efforts around process improvement.

The research team then examined approaches within the transportation field and beyond toward placing organizations along a de facto maturity spectrum but with language and information that focuses more on ongoing process improvement than on fixed levels of maturity. Other research products and guidance have adopted a range of approaches toward helping agencies locate themselves on a maturity spectrum and for representing such a spectrum to audiences:

- **NCHRP WebResource 1: Reducing Greenhouse Gas Emissions: A Guide for State DOTs (NCHRP Project 25-56):** This guide provides guidance on practical and innovative methods for state DOTs to assess and advance emission reducing strategies in their planning and programming. After finding that DOTs struggled to find appropriate methods and programming decisions that match their needs and decision-making context, the research team developed a series of “self-assessments” to assist staff in determining where their agency falls on a variety of spectrums associated with greenhouse gas engagement. Level of DOT engagement was ranked generically from 1 through 4 (Cambridge Systematics, Inc., et al. 2022).
- **Data Visualization Methods for Transportation Agencies (Higgins et al. 2016a) and NCHRP Web-Only Document 226: Data Visualization Methods for Transportation Agencies (NCHRP Project 08-36/Task 128 VizGuide; Higgins et al. 2016b):** The VizGuide is intended as a resource for transportation professionals who want to use illustrations and visualizations to communicate their ideas to an audience. Derived from NCHRP Project 08-36/Task 128, “Data Visualization Methods for Transportation Agencies,” the site breaks content into six sections: Examples, Process, Charts, Style, Tools, and Resources (Higgins et al. 2016a). The Examples section offers short case studies and details where users can replicate some functionality with varying technical skills or software access. For example, a case study in one tool notes that “an intermediate knowledge of Microsoft Excel or Adobe Illustrator is necessary to replicate the dial, but a choropleth can be created easily in many visualization programs, including Tableau, Microsoft PowerBI, ArcMap, and QGIS” (Higgins et al. 2016a).
- **The Analytics Playbook for Cities: A Navigational Tool for Understanding Data Analytics in Local Government, Confronting Trade-Offs, and Implementing Effectively:** This report from the Harvard Ash Center is aimed at practitioners who are thinking about choosing to name their first Chief Data Officer, start their first analytics team, or empower an existing group of individuals. The report is offered online in PDF form. Though the format provides limited functionality, it gives an example of integrating examples and external content into an otherwise static document. The report's body offers sidebars with examples from cities, while an appendix expands on these case studies. Footnotes and body text provide clickable hyperlinks, connecting users to additional resources (Mashariki, Diaz, and Eaves 2020).
- **Cyber Essentials Toolkit:** This resource from the Cybersecurity and Infrastructure Security Agency (CISA) is a set of modules designed to break down the CISA cyber essentials into bite-sized actions for information technology (IT) and C-suite leadership to work toward full implementation of each cyber essential. Each chapter is an individual PDF that highlights key actions. Each key action includes a list of resources for taking action, which link to external resources. All actions are identified either as actions for leaders or discussions with IT staff or with service providers; the guide's simplicity makes the takeaways and responsibilities clear (CISA 2020).

Finally, the research team looked for visual examples of a maturity spectrum that would best fit the Snapshot format. Some key findings included:

- **Strategic Highway Research Program Capability Maturity Framework:** This framework provides an example of a transportation-related maturity model developed for the Strategic Highway Research Program. The maturity framework is process-driven and provides self-assessments to identify position along the maturity spectrum. It then provides six process improvement dimensions: business process, systems and technology, performance measurement, workforce, culture, and collaboration, as well as specific actions necessary to progress through four capability levels that range from “Ad-Hoc, Low Level of Capability” to “Optimized, Highest Level of Capability.” This model integrates self-assessments for each process improvement dimension (FHWA 2016).
- **Smart Cities Readiness Maturity Model:** This model provides five maturity levels and the various dimensions that a city must address/improve to mature along the spectrum. It provides details on different dimensions of Smart City programs, such as strategic intent, data, and stakeholder engagement, and what needs to be done to mature along the spectrum. It features five maturity levels, ranging from “Ad-Hoc” to “Optimized,” and provides an overview of how a level’s approach effects outcomes. This visualization provides a thorough and detailed resource for cities to understand where they fall along the spectrum and what they need to do to advance their programming (Scottish Cities Alliance, the Scottish Government, and Urban Tide 2014).

Panel Feedback

On May 2, 2024, the research team presented initial outreach findings and Snapshot design concepts to the NCHRP Project Panel. Panel feedback and research team responses to that feedback are summarized here:

- **The research team should be aiming for convergence:** The panel noted that the research team will know when outreach is complete when the team starts hearing the same things repeatedly. Given that this had not occurred at that time, it was clear that additional organizations should be contacted for interviews. Panel members recommended several organizations for additional outreach, including the following:
 - Complete Streets: Florida DOT, Nebraska DOT
 - Data sharing for performance management: Connecticut DOT
 - Collaboration on local freight delivery: New Jersey MPO
 - Economic analysis to support decision-making: Michigan DOT, Nebraska DOT
 The research team subsequently contacted those organizations for interviews, and was able to schedule an interview with Michigan DOT. The interview guide also changed based on the approval of the maturity model framework. The revised Phase I Interview Guide can be found in Appendix D.
- **The maturity model and compilation of resources approach makes sense:** The panel affirmed that the maturity model approach would allow the Snapshots to supply useful information to different types of organizations. It was noted that many agencies that struggle to move to implementation may remain at the initial stage for a long time; it is useful to provide resources and examples for those agencies as they establish the groundwork for future implementation. Further, the panel agreed that compiling different resources for organizations along the spectrum would be useful.
- **Certain Snapshots need to incorporate additional information:** While reviewing the draft interview and focus group findings, the project panel identified the need for additional information. For example, Complete Streets should include more information on public engagement, while the data sharing for performance management topic should include more

information on data-sharing agreements and platforms. The panel was also interested in learning more about where gaps remain, even for organizations identified as leading on the maturity spectrum. Where specific gaps were identified, the research team incorporated additional content into the Snapshots. The research team has documented in this report the findings related to the remaining gaps.

- **There are certain topics that should be highlighted across all Snapshots:** The research team noted that data sharing had emerged as an issue in all Snapshot topics. The panel agreed that this topic should remain an independent Snapshot but that it should be discussed as a distinct component of each of the other Snapshots. The research team responded to this by developing a data subsection (Data and Performance Management) for the practices summarized in each of the final Snapshot designs.



CHAPTER 3

Snapshot Content and Design Development

Prototype Planning Snapshot

Based on the engagement findings and an analysis of sample formats, the research team drafted an initial layout for the Snapshot products. Key features of this design were as follows:

- **Building, Maturing, and Leading:** The spectrum initially developed for these Snapshots was divided into three categories:
 - “Building” describes practices, examples, and resources relevant to agencies that are new to the topic area or setting up a new program.
 - “Maturing” describes practices among agencies that are expanding or growing their efforts in a topic area and taking on increasingly complex aspects of the topic.
 - “Leading” describes practices, examples, and resources relevant to agencies that are innovating or establishing national best practices in a topic area.
- **Key Practices, Examples, and Resources:** The Snapshots initially were split into three distinct pages offering key elements that practitioners said they wanted to see in the Snapshot products.
 - “Key Practices” quickly identifies what agencies in each area of the spectrum are doing. Key practices were divided into three elements common across all columns:
 - Organization, Workforce, and Partnerships: Key practices identified in this category include activities related to the development of relationships internally and externally to advance a policy or program, workforce capacity or training need, and topics related to the structure of the organization itself.
 - Data and Performance Management: Key practices identified in this category include activities related to data collection and management, data sharing, monitoring and evaluation, and performance reporting.
 - Policy and Program Design: Key practices identified in this category include activities related to establishing or expanding programs or policies to achieve the desired outcomes.
 - “Examples” provides a quick overview of a single agency’s practice in an area to orient readers to what a building, maturing, or leading agency looks like.
 - “Resources” offers links to guidance, toolkits, or other agencies’ work products that can help direct and inform agencies’ work, whether they are just building their practices or are a national leader in the topic.

The initial draft Snapshot design used the content developed for the Complete Streets topic; the draft Snapshot design is included in Appendix F.

Revised Snapshot Design and Engagement

Phase II of this project involved in the creation of the revised Snapshot products, consultation with practitioners and the project panel to refine these products, and development of final research products and implementation plans. This work was organized into two major tasks: finalization of the Snapshot prototypes and re-engaging practitioners to collect feedback on the draft.

Revised Snapshot Designs

On July 31, 2024, the project panel and the research team convened for an interim meeting in Washington, DC. At this meeting, the research team presented the first iteration of the Snapshot prototypes and solicited input on these products. The Task 6 memo summarizes key design changes implemented in these updated Snapshots. Key input received was as follows:

- **The Snapshots should include content that answers the question “Why is this topic important?”:** In response to this feedback, the research team added a new cover page with a “Why?” heading for each topic. This section explains why each topic is important. Adding a cover page provided an opportunity to expand the written and visual content to lay the groundwork for each Snapshot topic.
- **The Snapshots should be more visual:** The panel felt that there was too much text and too few infographics, images, or other graphics. In response to this, the research team designed the next Snapshot prototype to integrate a visual By the Numbers section on the new cover page and, as available, add a graphic to the same page. The team also incorporated photos into the organizational practices described on the Examples page.
- **The current organization may imply a value judgment:** The categories Building, Maturing, and Leading, though designed to be somewhat neutral in language, may still be too strong and imply a value judgment. In response to this feedback, the research team considered several alternative naming conventions and adopted the following new category names: Designing, Enhancing, and Advancing.
- **There should be greater emphasis on the levers of change and how organizations can choose to optimize for different things:** The key practices are divided into three categories, which are the levers of change: Organization, Workforce, and Partnerships; Data and Performance Management; and Policy and Program Design. In response to this feedback, the research team added some explanatory text to the key practices introduction.
- **The Snapshots should be expanded to offer more examples and organization types:** For example, the research team should seek to include a mix of DOTs, MPOs, and urban/rural jurisdictions. In response to this feedback, the research team incorporated additional examples into the Examples page.
- **Snapshots should identify remaining questions or gaps:** In addition to highlighting areas for future research or exploration, this would provide something for the leading organizations to look into. In response to this feedback, the research team identified remaining questions in a callout box on the Key Practices page.

Following this meeting, the research team incorporated panel feedback for revised Snapshot products. This effort included:

- Adding a navigation (or cover) page to the Snapshots that provides visualizations and a topic overview and directs practitioners to the Snapshot content most useful to them.
- Expanding “Examples” pages to include more examples that cover a wider range of organization types.
- Incorporating specific content edits to each topic that reflected panel feedback. For example, the economic measures topic name was revised from “Programmatic Economic Measures Evaluate and Prioritize Transportation Projects and Investments” to “Economic Analysis to Support Decision-Making,” and the local freight topic was revised from “Agency Collaboration on Freight Delivery in Local Communities” to “Collaboration on Local Freight Delivery.” These nomenclature changes are intended to simplify and clarify the Snapshot topic focus. The Complete Streets topic was expanded to include more content on freight and public transit.
- Revising the current organization from “Building, Maturing, and Leading” to “Designing, Enhancing, and Advancing” to ensure that the terms used to describe the spectrum do not indicate a value judgment.

Practitioner Engagement

For Phase II practitioner engagement, the project team focused on re-engaging practitioners who participated in Phase I to gather feedback on the key practices, examples, and resources for each of the Snapshot topics and identifying any remaining questions and gaps in the research. Additionally, practitioners were asked for feedback on the Snapshot design and the continuation of the Snapshot series.

The project team engaged practitioners through a multifaceted approach that included a webinar, interviews, and outreach to industry organizations. The sections that follow are organized according to the type of outreach conducted, which included the following:

- **Industry Organization Outreach**
 - **Interviews:** Conducting additional conversations with representatives from AMPO and NACTO to discuss Snapshot content and layout.
 - **AASHTO Conference on Data Management and Analytics, Planning, and Performance-Based Management (September 16–20, 2024) St. Louis, Missouri:** Presented midpoint findings to the Committee on Planning at the AASHTO Conference on September 19th.
- **Webinar:** Conducting a Snapshots Midpoint Assessment and Feedback Webinar to obtain feedback from interviewees, focus group members, and other interested practitioners.

Industry Agency Outreach

The research team presented an overview of the project and research findings at the AASHTO Committee on Planning meeting on September 19th, 2024. Key points from this presentation and resulting discussion included distribution methods, long-term document storage, and topic identification, including how topics are chosen, specificity, and the production process.

The research team conducted follow-up interviews with representatives of AMPO and NACTO, as these agencies had been interviewed in the Phase I engagement. These organizations were engaged to provide feedback on the Snapshot content and design for all four Snapshot topics. Table 8 summarizes the outreach and key takeaways.

Webinar

The project team organized a webinar to gather insights from practitioners who were involved in the Phase I engagement, including interview and focus group participants. Additionally, the project team engaged committee leaders from AASHTO to distribute invitations to key industry leaders. The invitation included a registration survey that participants could use to indicate the Snapshot topic they were most interested in discussing. In total, the project team contacted 57 individuals or agencies for participation, resulting in 37 total webinar participants. The invitation for the webinar and the discussion guide used for facilitation can be found in Appendix G and Appendix H.

The project team conducted the webinar on October 9, 2024. The presentation began with an overview of the project and research goals, the project progress to date, and an outline of the engagement findings. The key practices and examples for each Snapshot topic were shared, and participants were asked to participate in a discussion on Snapshot content and format. Then, the Snapshot design was shared, and practitioners were asked to weigh in on the effectiveness of the product and Snapshot distribution. Feedback from the webinar discussions is outlined in the next subsection.

Table 9 shows the agencies represented at the webinar.

Key Takeaways

The feedback gathered during the Phase II practitioner engagement was generally positive. Most feedback provided insight into how to distribute the Snapshots and how the Snapshots can continue to be useful to practitioners. Key input that led to Snapshot content changes included

Table 8. Interview dates and summaries.

Interview Date	Interviewee/ Engagement	Key Takeaways
September 19, 2024	AASHTO Committee on Planning	<ul style="list-style-type: none"> • General: Suggestions for distribution of the final Snapshots include those who currently work on these issues and the next generation of planners. There is general consensus that the Snapshot program should continue, and a process to continuously update the Snapshots and identify new topics should be developed.
September 20, 2024	NACTO	<ul style="list-style-type: none"> • General: Suggested a simplified approach to infographics. Recommended outlining basic requirements for DOTs and MPOs interested in the topic. • Complete Streets: Recommended adding an example that speaks to “why make streets complete?” • Data Sharing for Performance Management: Recommended a more visual narrative approach and including more examples on data analysis. • Collaboration on Local Freight Delivery: Appreciated the content of this Snapshot and recommended reducing the number of infographics and diversifying examples. • Economic Analysis to Support Decision-Making: Highlighted the need for efficient resource use and guidance for this.
October 2, 2024	AMPO	<ul style="list-style-type: none"> • General: Appreciated the Snapshot framework for its clarity and comprehensibility. Highlighted need for scalability for small MPOs and recommended including practices that they could apply. • Complete Streets: Recommended changing an FTA resource because it is outdated and including a discussion of economic benefits of Complete Streets. • Data Sharing for Performance Management: Recommended including a discussion of efforts to create better data linkages (e.g., connecting hospital records to crash data). • Collaboration on Local Freight Delivery: Recommended including Southern California Association of Governments (SCAG) as a leading practitioner and adding more information on truck parking. • Economic Analysis to Support Decision-making: No significant feedback.

information that one of the case studies did not quite capture recent changes in the DOT’s current program. Based on this feedback, the research team sent each agency their Snapshot case study blurb to ensure that their work was captured accurately as of the date of the draft final report. The research team received feedback from 10 agencies, nine of which provided updates that are reflected in the final Snapshot content.

A year-long communications campaign was recommended to disseminate the Snapshots. Existing industry conferences and associations, such as AASHTO, AMPO, NACTO, and the

Table 9. Webinar date and attendees.

Date/Time	Organizations Represented
10/9/2024 1:00 p.m. ET	<ul style="list-style-type: none"> • Arizona DOT • Chicago Metropolitan Agency for Planning • Virginia Department of Rail and Public Transportation • FDOT • Hawaii DOT • Illinois DOT • Indiana DOT • FuturePlan Consulting (FL) • Kentucky Transportation Cabinet • MAG • Montana DOT • Michigan DOT • MnDOT • Missouri DOT • National Association of Development Organizations (NADO) • New York DOT • Oregon Metro • Pennsylvania DOT • North Carolina DOT • Utah DOT • Virginia DOT • WSDOT

National Association of Development Organizations (NADO), should be utilized. Additionally, nontraditional, topic-specific groups should be engaged. Participants support continuing the Snapshot series and noted that working on multiple topics at once can highlight connections across the Snapshots. Maintaining relevance is challenging because of frequent changes in agency practices. NCHRP should select topics that are relevant over time while also finding a way to address emerging trends.

Final Snapshot Content and Design

The final Snapshot products reflect the feedback from the project panel and stakeholders. Changes were made based on feedback received during the interim panel meeting (discussed previously) and feedback from individual agencies on their key practice descriptions. The updated and final Snapshot products can be found on the NAP website (nap.nationalacademies.org) by searching for *NCHRP Web-Only Document 431: Snapshots of Planning Practices*.

Implementation Plan

The Implementation Plan identifies potential strategies for the release and distribution of the Snapshots series to enhance awareness and ensure ongoing relevance. The initial set of Snapshots developed through NCHRP Project 08-36(120) relied on traditional distribution channels and an independent website that was hosted by the contractor.

The objective of this plan is to outline goals for increasing awareness and distribution of the series while addressing challenges, such as the need for active communication, long-term support, and continuous maintenance of Snapshot products online. Through state-of-the-practice interviews, webinars, panel meetings, and conference discussions, the research team gathered insights and documented strategies for dissemination, sustained usage, and sharing to broaden the impact of the Snapshots and ensure long-term success. The Implementation Plan can be found on the NAP website (nap.nationalacademies.org) by searching for *NCHRP Research Report 1158: Developing Snapshots for Transportation Planning*.

To promote consistency and relevance, the Snapshot format should be institutionalized with a standardized approach to future projects. This will also help practitioners understand and use the Snapshots more effectively moving forward. A feedback mechanism should be developed that enables agencies to report updates, changes, and advancements in their programs. Agencies not originally featured could also request consideration for inclusion in a Snapshot. To maintain accuracy over time, a regular review process should be implemented to periodically assess key practices and resources.

The plan provides a road map for increasing the visibility and sustainability of the Snapshot series. Key strategies include engaging with industry and nontraditional partners, developing a robust communication strategy, and addressing impediments such as technical and hosting challenges, resource constraints, and the need for ongoing updates. Future steps could focus on leveraging industry networks and digital tools to improve search visibility, and on standardizing the Snapshot format for consistency. The immediate next steps would include:

1. Establishing online hosting and maintenance plans;
2. Engaging key stakeholders and identifying any additional organizations necessary to support dissemination;
3. Executing a targeted communications rollout that includes social media outreach, webinars, and presentations at industry events; and
4. Creating a plan to update the Snapshots over time and developing a new set of Snapshots.

Conclusions and Suggested Research

This research report has documented the research performed as part of the development of the Snapshots of Planning Practices. Key findings of the work are summarized in the following:

- The literature review identified several key topics for each of the four Snapshot topic areas, including key practices, program resources, and potential interviewees.
- Stakeholder engagement provided insight into key practices and which agency case studies to highlight in the Snapshots. Engagement also guided the design and formatting of the Snapshots to ensure that they were the most useful to the target audience.
- The Implementation Plan identified multiple next steps to ensure that the Snapshots are findable by those that would benefit from them.

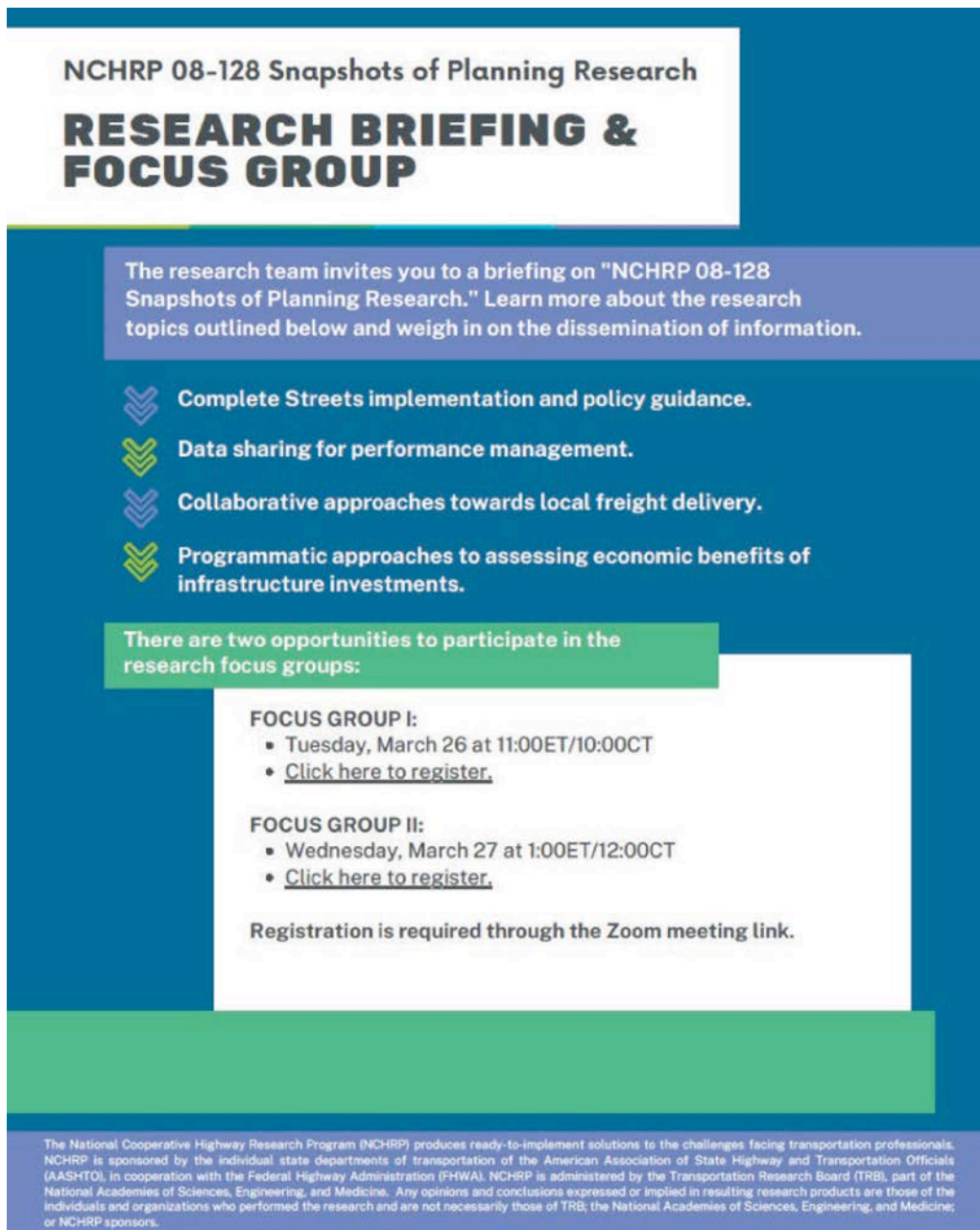
The Implementation Plan also identifies areas for continued research. This includes establishing hosting and maintenance plans, engaging in stakeholders to support dissemination, and developing a communication rollout plan once the Snapshots are ready for roll out. Additionally, continued engagement with stakeholders to identify new Snapshot topics, develop research scopes, and support dissemination will be important to ensure that the products are useful to practitioners.



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Focus Group Invitation

The graphic is a vertical rectangle with a blue background. At the top, a white box contains the text 'NCHRP 08-128 Snapshots of Planning Research' and 'RESEARCH BRIEFING & FOCUS GROUP'. Below this, a purple box contains an invitation to a briefing. A list of four topics with chevron icons follows. Then, a green box states there are two opportunities to participate. Below this, a white box lists the details for two focus groups. At the bottom, a green box contains a disclaimer.

NCHRP 08-128 Snapshots of Planning Research

RESEARCH BRIEFING & FOCUS GROUP

The research team invites you to a briefing on "NCHRP 08-128 Snapshots of Planning Research." Learn more about the research topics outlined below and weigh in on the dissemination of information.

- Complete Streets implementation and policy guidance.
- Data sharing for performance management.
- Collaborative approaches towards local freight delivery.
- Programmatic approaches to assessing economic benefits of infrastructure investments.

There are two opportunities to participate in the research focus groups:

FOCUS GROUP I:

- Tuesday, March 26 at 11:00ET/10:00CT
- [Click here to register.](#)

FOCUS GROUP II:

- Wednesday, March 27 at 1:00ET/12:00CT
- [Click here to register.](#)

Registration is required through the Zoom meeting link.

The National Cooperative Highway Research Program (NCHRP) produces ready-to-implement solutions to the challenges facing transportation professionals. NCHRP is sponsored by the individual state departments of transportation of the American Association of State Highway and Transportation Officials (AASHTO), in cooperation with the Federal Highway Administration (FHWA). NCHRP is administered by the Transportation Research Board (TRB), part of the National Academies of Sciences, Engineering, and Medicine. Any opinions and conclusions expressed or implied in resulting research products are those of the individuals and organizations who performed the research and are not necessarily those of TRB, the National Academies of Sciences, Engineering, and Medicine, or NCHRP sponsors.

Figure A-1. Focus group invitation.



APPENDIX B

Focus Group Discussion Guide

This document was used to support discussion for the two focus groups convened by the research team.

Discussion Questions—Leading Practices (15 Minutes)

- First start with case studies—Anything we missed as far as leading practices nationwide. What are the emerging or innovative trends you are seeing? (steer toward DOT) (you or other agencies)
- What are some key challenges in your own work? What would you like to find out about other DOT or MPO practices on this topic?
- How would you expand/improve your own work in Complete Streets if more budget/resources/time?

Discussion Questions—Snapshot Content and Design (25 Minutes)

- When looking for information on a topic, what is most valuable? For example, best practices, survey results on what agencies are doing what, example policies or guidance, research findings, synthesis of problems and challenges, or summaries of solutions and implementation guidance?
- What type and level of information do you typically have time to consume? What do you not have time for?
- What information do you find yourself most commonly searching for or having to discover to prepare for meetings or briefings?
- What is your preferred media and format for research resources? Do you typically save, print, share, bookmark, or view resources?
- Are there examples of research products or summary briefings from the industry or from other industries that you have found helpful and valuable?
- How do you typically find, browse, share, and consume information on industry research?
- What specific information or best practices would you be most interested in learning about from other AASHTO agencies?
- What types of communication or follow-up around the Snapshot products would best ensure dissemination/use?
- What would make the visuals (photos, videos, graphics) more engaging and informative?
- Would media formats be most useful and effective in conveying the information?

Phase I Interview Discussion Guide

This document was distributed to interviewees in advance of the virtual interview.

Interview Guide

NCHRP Project 08-128, “Snapshots of Planning Practices,” builds on a previous research effort, NCHRP Project 8-36(120). NCHRP 8-36(120) produced 10 Snapshots between 2013 and 2018 that provided high-level information on innovative planning practices nationwide. You can review a previous iteration of a Planning Practices Snapshot at [https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP08-36\(120\)_Snapshot2016-008IntegratedPlanning.pdf](https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP08-36(120)_Snapshot2016-008IntegratedPlanning.pdf).

NCHRP Project 08-128 focuses on four areas of planning practice:

- **Complete Streets Implementation:** Policies, methods, tools, and processes used by state DOTs and MPOs to accommodate these different modal uses of the roadway and road rights-of-way.
- **Data Sharing for Performance Management:** Strategies, methods, processes, and procedures for identifying and adopting specific planning performance metrics.
- **Collaboration on Freight Delivery in Local Communities:** Collaborations between state DOTs, MPOs, local governments, and private-sector freight providers to address the growing demands of goods movement on transportation networks.
- **Programmatic Economic Measures to Evaluate and Prioritize Transportation Projects:** Best practices in calculating the economic impact of transportation projects to evaluate and prioritize transportation projects and investments.

In this project, we are engaging practitioners one-on-one and through focus groups to learn more about what will make these Snapshots more visible, useful, and informative and to draw out key case studies to highlight in these products. The questions that follow are divided into those related to case studies and Snapshot products. These questions will serve as a guide for conversation.

Case Study

In addition to any general questions to clarify the nature of the agency’s practice, program, or policy, we plan to cover the following topics:

- What do you think is innovative about this effort and what should other DOTs or MPOs learn from your experience?
- What specific aspects of the project could be adapted or replicated by other agencies?
- What worked well? What do you plan to change moving forward?
- What were the key challenges and successes experienced during the project?
- Are there any other national leading practices you used to model/design your practice/program/policy?
- How would you have expanded on the practice/program/policy if you had more time or resources?
- How did you measure success? Are there any results or data that demonstrate the project’s impact?
- What would you like to find out about other DOT or MPO practices on this topic?

Snapshot Content and Design

- When looking for information on a topic, what is most valuable? For example, best practices, survey results on what agencies are doing what, example policies or guidance, research findings, synthesis of problems and challenges, or summaries of solutions and implementation guidance?
- What type and level of information do you typically have time to consume? What do you not have time for?
- What information do you find yourself most commonly searching for or having to discover to prepare for meetings or briefings?
- Are there examples of research products or summary briefings from the industry or from other industries that you have found helpful and valuable?
- How do you typically find, browse, share, and consume information on industry research?
- What is your preferred media and format for research resources? Do you typically save, print, share, bookmark, or view resources?
- What specific information or best practices would you be most interested in learning about from other AASHTO agencies?
- What types of communication or follow-up around the Snapshot products would best ensure dissemination/use? If we have additional time, we will discuss the previous Snapshots products.
- How might the Snapshots more effectively communicate the key aspects of the project/initiative?
- What would make the visuals (photos, videos, graphics) more engaging and informative?
- What media formats are most useful and effective in conveying the information?
- What would make it easier for agencies to ingest key takeaways from the Snapshots to apply to their own work?

Revised Phase I Interview Guide

This document was distributed to interviewees in advance of the virtual interview. As the research team's understanding of Snapshot form and content evolved, so too did the information needs. This guide was revised to structure the conversation around the maturity model structure format that the project panel approved.

NCHRP Project 08-128, "Snapshots of Planning Practices," builds on a previous research effort, NCHRP Project 8-36(120). NCHRP Project 8-36(120) produced 10 Snapshots between 2013 and 2018 that provided high-level information on innovative planning practices nationwide. You can review a previous iteration of a Planning Practices Snapshots at [https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP08-36\(120\)_Snapshot2016-008IntegratedPlanning.pdf](https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP08-36(120)_Snapshot2016-008IntegratedPlanning.pdf). In this project, we are engaging practitioners one-on-one to draw out key case studies to highlight in these products.

In addition to any general questions to clarify the nature of the agency's practice, program, or policy, we plan to cover the following topics in this interview:

- Within the topic(s) areas identified for this interview, where on Figure D-1 do you see your practice/program, and what were the steps you had to take to get there?
- What were the key challenges to building and maturing your practice or program?
- What would you do if you wanted to move to "leading" practices? What would be the benefit of doing so?
- Who are the other agencies you look to that are doing innovative things in any of the categories in Figure D-1?
- What would you like to find out about other DOT or MPO practices on this topic?

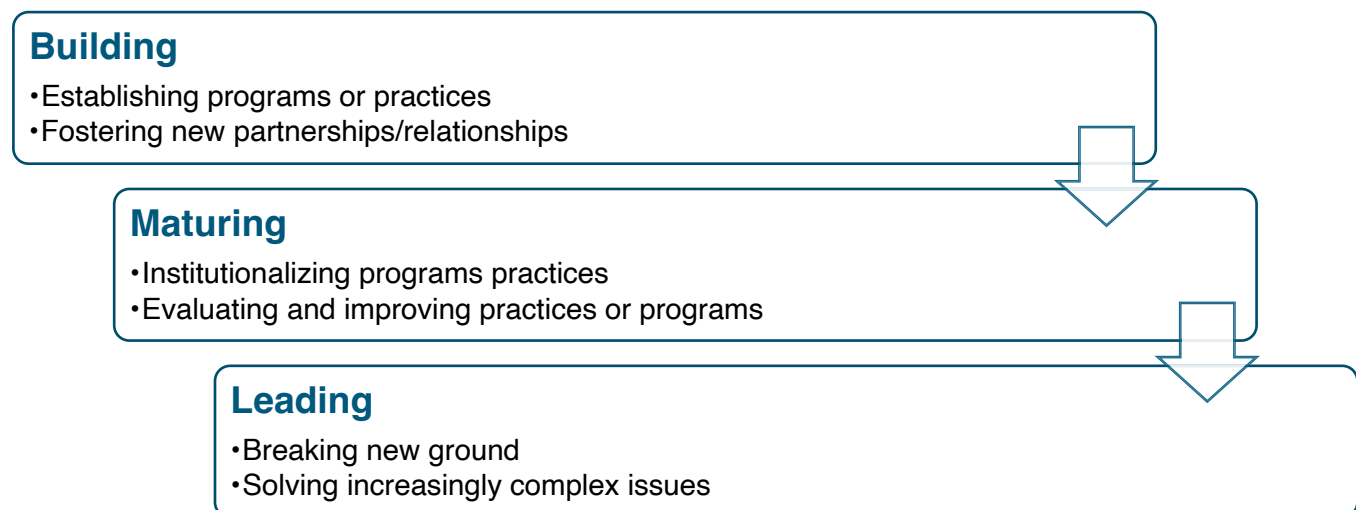


Figure D-1. Flow chart of the spectrum of practice.



APPENDIX E

Proposed List of Interview Candidates and Topics

After the literature review, the research team provided to the project panel a list of proposed agencies and organizations to be interviewed for each Snapshot topic. Each topic had a short list of priorities for the interviews followed by additional options. The table that follows summarizes this effort.

Complete Streets

Top Priorities for Interviews

- **Bay Area Metropolitan Transportation Commission (MTC) Regional Planning Program.** The MTC passed Resolution No. 4493, which requires all projects that seek to use regional funds to meet Complete Streets standards to receive discretionary funding or funding endorsements from MTC. This policy is unique and shows how an MPO can use policy to potentially significantly increase the number of Complete Streets projects in a region.
 - **Arlington County, Virginia.** The Neighborhood Complete Streets Commission is unique as it is made up of residents. This program was created in 2016 to make recommendations for projects to fund. In 2023, it recommended two projects to increase accessibility.
-

Additional Options for Interviews

- **Ohio DOT.** Ohio DOT has developed many guides and resources for implementing Complete Streets and bicycle and pedestrian facilities, including the Multimodal Design Guide and training on Complete Streets Policy Development.
 - **Oregon Metro.** Oregon Metro developed the Designing Livable Streets and Trails Guide, which provides guidance for the 2040 Growth Concept and the Regional Transportation Plan. Oregon Metro has opted to use the term “livable streets” and strives to provide networks of livable streets that provide all functions as a network.
 - **MnDOT.** In 2022, MnDOT provided a baseline transportation hierarchy project based on context, user type, and transportation characteristics. This tool is unique as it shows an example of resources that state agencies can use to prioritize Complete Streets projects for funding internally, as well as potential for future resources that can be made public for local jurisdictions.
 - **New Jersey DOT.** Bureau of Safety, Bicycle, and Pedestrian Programs. New Jersey DOT's Sustainable Jersey Land Use and Transportation Task Force supports the coordination of initiatives like Complete Streets. New Jersey recently developed a comprehensive approach to Complete Streets, including a guidebook for implementing, checklists, and standard operating procedures.
 - **WSDOT.** Washington lawmakers approved Senate Bill 5937, which added a new rule to the Revised Code of Washington stating that when planning state highway projects of \$500,000 or more, the DOT must consider Complete Streets principles.
 - **California Department of Transportation (Caltrans).** The Caltrans Complete Streets Action Plan follows the Director's Policy on Complete Streets passed in 2021, which requires that all Caltrans projects use Complete Streets principles. This is a unique example of statewide guidance on Complete Streets design and guidelines.
-

Data Sharing for Performance Management

Top Priorities for Interviews

- **City of Atlanta.** Representatives from the city of Atlanta were part of a TRB 2023 panel called Using Data to Improve Transportation System Performance. The city and Georgia Tech partnered to launch the North Avenue Smart Corridor Project. A major initiative within the Planning Department is SHIFT ATL.
- **Utah DOT.** UPlan is a web-based decision-support mapping and informational tool that lets users have complete or selective data sharing among work units within the DOT, between state DOTs, and with the public. Utah DOT has also developed a product for analyzing automatic traffic signal performance measures.

Additional Options for Interviews

- **City of Cincinnati.** Cincinnati was part of an innovative partnership with Uber through the Cincinnati Mobility Lab. The collaborative includes the Cincinnati USA Regional Chamber, the city of Cincinnati, and Ohio-Kentucky-Indiana Regional Council of Governments (OKI), in partnership with Southwest Ohio Regional Transit Authority (SORTA) and Transit Authority of Northern Kentucky (TANK).
- **The Eastern Transportation Coalition.** The Eastern Transportation Coalition's Transportation Data Marketplace is designed to provide coalition members with the ability to acquire reliable and real-time travel time and speed data for their entire roadway network without the need for sensors and other hardware. Members can select from a host of prequalified vendors to provide data in six distinct categories: travel time and speed, origin-destination, freight, waypoint, volume, and conflation.
- **NACTO.** NACTO was part of a 2023 TRB panel called Data-Driven Transportation Planning: A Vision for the Future. Along with the International Municipal Lawyers Association (IMLA), it also published the Managing Mobility Data report, which agencies and private-sector partners to share, protect, and manage data to meet transportation planning and regulatory goals in a secure and appropriate manner.
- **Iowa DOT.** Iowa DOT was part of a TRB 2024 panel called Breaking Down Organizational Silos with Data Standards. Iowa DOT also has a unique data management plan.
- **Southern California Association of Governments (SCAG).** One of SCAG's major initiatives is its Regional Data Platform, which is a collaborative data-sharing and planning platform.
- **Open Mobility Foundation.** The Open Mobility Foundation develops open-source standards and tools through a governance structure that brings together stakeholders from the public and private sectors to advance shared goals and work toward the common good.

Collaboration on Local Freight Delivery

Top Priorities for Interviews

- **NYC DOT.** The NYC Off-Hour Delivery Program is a pilot initiative by NYC DOT to encourage businesses to shift their deliveries from peak hours (7 a.m. to 7 p.m.) to off-hours (7 p.m. to 6 a.m.). The pilot included collecting and inventory of off-street loading docks to understand where there was/was not capacity. The Off-Hour Delivery Program has also collaborated with other organizations such as the NYC Economic Development Corporation on efficient use of the city's waterways to transport goods around the city, including areas around Brooklyn and Hunt's Point. More than just reducing congestion on NYC streets, this project also aims to improve public health by reducing emissions caused by trucks sitting in traffic.
- **MAG.** In seeking to address truck and driver shortages, MAG has identified strategies to shift to just-in-time delivery with strategically located distribution centers. MAG is conducting four freight

subarea project assessments in the industrial clusters of the MAG region that focus on moving goods more efficiently, reducing congestion, and improving safety.

Additional Options

- **Texas DOT.** TXDOT has integrated multimodal freight and economic considerations into its overall agency planning and programming. Its Multimodal Freight Mobility Plan and the Texas-Mexico Border Transportation Master Plan are innovative approaches to freight planning.
 - **Seattle Department of Transportation.** Seattle DOT has collaborated with the University of Washington's Urban Freight Lab on the Last Mile Freight Curb Access Program. In 2023, the Urban Freight Lab, Open Mobility Foundation, and Seattle DOT received a \$2 million Strengthening Mobility and Revolutionizing Transportation (SMART) grant for curbside management digitization.
 - **Colorado DOT.** Colorado DOT has developed a successful truck parking information system and employed successful strategies to improve parking availability. It partnered with the town of Bennett, CO, to solve the town's capacity needs and incentivize growth at a local facility.
 - **District DOT.** In 2017, the District of Columbia Department of Transportation launched its first curb space pilot in 2017 in partnership with a local business improvement district.
 - **Atlanta Regional Commission (ARC).** In 2019, ARC began working with local partners on freight cluster plans in areas with significant industrial development. The 2016 Atlanta Regional Freight Mobility Plan Update identified the need to conduct local, small area freight planning.
 - **New Jersey Office of Planning Advocacy.** In 2022, the New Jersey Office of Planning Advocacy released guidelines on warehouse development. The first-of-their-kind guidelines were created to help municipalities decide when to approve warehouse development while protecting New Jersey's infrastructure and environment.
-

Programmatic Economic Measures to Evaluate and Prioritize Transportation Projects and Investments

Top Priorities for Interviews

- **Ohio DOT.** In collaboration with the Department of Development and the Governor's Office of Workforce Transformation, Ohio DOT developed a Strategic Transportation and Development Analysis to be used for a statewide study of the Ohio transportation system.
 - **Broward Metropolitan Planning Operation.** Broward incorporated a 10-point scale for assessing the impact on economic vitality into its project prioritization process.
-

Additional Options for Interviews

- **MTC.** MTC uses an activity-based travel model to conduct a benefit-cost analysis (BCA) for any project with an estimated cost greater than \$100 million.
 - **Texas DOT.** Texas DOT has developed a BCA Grant Pipeline Screening tool that could be applicable to other types of transportation project screening processes.
 - **Atlanta Regional Commission (ARC).** In addition to having a quantitative criterion to score projects, ARC convenes the Transportation Equity Advisory Group and conducts a qualitative evaluation of projects via a two-pronged equity analysis to weight individual criteria used to score projects.
 - **Kansas City Department of Transportation.** The Eisenhower Transportation Program is a 10-year program that addresses transportation needs in Kansas; the process includes economic impact weighting criteria for expansion projects to help decide which ones to move forward.
 - **Port of Oakland.** The Port of Oakland has experience with BCAs for grant applications and has presented its lessons learned and how these BCAs could be useful for other parts of transportation prioritization.
 - **Virginia DOT.** The Virginia DOT SMART SCALE program evaluates potential transportation projects based on key factors, including their contributions to economic development.
-



APPENDIX F

Draft Snapshot Prototypes

The following pages present a draft Snapshot prototype.

SNAPSHOTS OF PLANNING PRACTICES COMPLETE STREETS IMPLEMENTATION KEY PRACTICES		
Complete Streets are roadways designed to meet the needs of all roadway users, including pedestrians, cyclists, wheelchair users, and public transit users. The scope of this Snapshot is to identify and demonstrate the policies, methods, tools, and processes used by state DOTs and MPOs to accommodate these different modal uses of the roadway and road rights-of-way. Our research indicated that practitioners are seeking information on Complete Streets policy, community engagement approaches, and implementation/design.		
BUILDING	MATURING	LEADING
<p>ORGANIZATION, WORKFORCE, AND PARTNERSHIPS:</p> <ul style="list-style-type: none"> Identifying Complete Streets champions within organization. These individuals can lead engagement with the organization, with other agencies, and with other planning organizations in prioritizing and making the case for Complete Streets. Assessing staff familiarity with Complete Streets concepts and devising curricula for training staff on road diets, pedestrian and active transportation safety, multimodal roadways, as needed. <p>DATA AND PERFORMANCE MANAGEMENT:</p> <ul style="list-style-type: none"> Conducting an inventory of available data related to active transportation and starting to collect and consolidate relevant data and identify gaps. Identifying a prioritized active transportation network and translating this information into a geographic information system (GIS) layer. Agencies also may make this layer available internally and provide guidance on how to integrate the information into the project scoping process. <p>POLICY AND PROGRAM DESIGN:</p> <ul style="list-style-type: none"> Establishing a Complete Streets policy. This policy could include: goals/objectives, discussion of existing data gaps, key messaging (both internally and with members of the public), mechanisms and processes for public involvement/ input on projects, and model design principles or standards. Considering immediate funding sources for Complete Streets projects. If possible, exploring funding opportunities such as state matching funds. 	<p>ORGANIZATION, WORKFORCE, AND PARTNERSHIPS:</p> <ul style="list-style-type: none"> Identifying and engaging active transportation and pedestrian coalitions and stakeholders. Working collaboratively with partner agencies to determine ongoing responsibilities related to maintenance of Complete Streets infrastructure. Integrating the understanding of these roles into Complete Streets policies. Utilizing relationships established in the "Building" phase to encourage localities to develop their own local road safety plans. <p>DATA AND PERFORMANCE MANAGEMENT:</p> <ul style="list-style-type: none"> Establishing performance measures for Complete Streets projects. For example, agencies might look at bicycle/ pedestrian fatalities, mode shift, miles of infrastructure built, equity in active transportation usage. Implementing strategies identified in Complete Streets policy document to fill existing data gaps. <p>POLICY AND PROGRAM DESIGN:</p> <ul style="list-style-type: none"> As the Complete Streets program expands, utilizing pilots as demonstrations of non-standard roadway designs. Ensuring adequate evaluation mechanisms are in place in order to justify approaches to be implemented more widely. 	<p>ORGANIZATION, WORKFORCE, AND PARTNERSHIPS:</p> <ul style="list-style-type: none"> Deepening relationships with active transportation and pedestrian coalitions by conducting to these groups to discuss the organization's approach towards Complete Streets and to seek input. Institutionalizing Complete Streets as an integral component of certain types of transportation projects. Explore opportunities to use funding mechanisms to encourage inclusion of multimodal users early in conceptual project phases. <p>DATA AND PERFORMANCE MANAGEMENT:</p> <ul style="list-style-type: none"> Standing up a public-facing portal that visualizes established performance metrics and measures related to Complete Streets. Integrating bicycle and pedestrian data into regional transportation modeling. Expanding data collection as needed and explore data exchanges as a way to share and combine Complete Streets data across or within organizations. <p>POLICY AND PROGRAM DESIGN:</p> <ul style="list-style-type: none"> Establishing resources for technical assistance for Complete Streets implementation. This technical assistance may be linked to state funding programs. Developing Complete Streets education and/or toolkits for organization staff. Addressing regulatory barriers to Complete Streets (e.g., right-of-way acquisition). As needed, utilize relationships and champion established in the "Building" phase to advocate for legislative action.

SNAPSHOTS OF PLANNING PRACTICES

COMPLETE STREETS IMPLEMENTATION | EXAMPLES

BUILDING

While Kansas DOT (KDOT) has not implemented its Complete Streets program to date and sees itself in the “scoping” or “infancy” stage with regards to Complete Streets, the organization has done substantial work to prepare the agency to implement such a program.

KDOT has developed a GIS layer of known preferred routes for cyclists (the “Priority Route Network”) and implemented a process wherein projects overlapping this layer must undergo additional evaluation of shoulder width. KDOT also matches funding for all Safe Streets and Roads for All funding. For these grantees, KDOT established the Kansas Infrastructure Hub and the Built Kansas Fund, which is an organized technical assistance program for applications. Additionally, KDOT’s Local Roads Safety Initiative was an effort to encourage (with the aid of state funding) all 105 counties in Kansas to develop a local roads safety plan. In support of this effort, KDOT developed an active [transportation planning toolkit](#) for small- and mid-sized communities.

The champion identified in Kansas was the Bureau Chief of Transportation Safety. The Secretary of Transportation, Governor, and several staff members also championed the effort, which is communicated as a safety initiative (the “Safe Streets Program”).



MATURING

The Arlington Neighborhood Complete Streets Program (NCS) was established in 2016. A key feature of the NCS is the establishment of a Neighborhood Commission, a 5-member board that advises the County’s board and makes project recommendations. Divesting responsibility to this advisory body allows the board to operate more efficiently and effectively and allows for greater civic participation in Complete Streets implementation.

Having addressed most straightforward Complete Streets projects in the County by 2016, NCS’ task was to tackle increasingly complex projects. A key practice of NCS is the use of pilot projects to test out new approaches towards Complete Streets. For example, NCS has used pilots to test out a shared streets approach in locations where the DOT does not have usable right of way (ROW) to provide a sidewalk. NCS currently has nine pilot projects ongoing and plans to launch an additional three projects. Since 2020, they have allocated \$4.25 million towards Complete Streets Projects, including both Capital and Tactical (pilot) projects. The NCS itself is funded through the County’s Capital Improvement Plan.

NCS uses its [Neighborhood Complete Streets Program Guide](#) to guide project selection and prioritization. This document ensures that safety is the main objective of the proposed project.

**Neighborhood
Complete
Streets**



LEADING

In March 2022, MTC adopted a new Complete Streets Policy (MTC Resolution No. 4493), which requires that projects funded with regional funds implement local Complete Streets plans and implement All Ages and Abilities design guidelines on the Active Transportation Network. In support of this policy, MTC offers a [Complete Streets checklist](#), which can be used by agencies applying for regional transportation funds to make sure that people who bike and walk are considered early in project development.

MTC’s [Active Transportation Network Map](#) is an interactive public-facing portal that incorporates active transportation locations across the Bay Area. Layers display priority development areas, equity priority communities, transit rich areas, and planned and existing transportation infrastructure by county.

MTC also provides funding, toolkits, webinars and other resources to help cities create Complete Streets. For example, MTC offers resources and a toolkit for Complete Streets “Quick-Build” projects. MTC and the Bay Area Governments (ABAG) coordinate to offer technical assistance resources across Complete Streets topics on their [portal](#).



**METROPOLITAN
TRANSPORTATION
COMMISSION**

SNAPSHOTS OF PLANNING PRACTICES

COMPLETE STREETS IMPLEMENTATION | RESOURCES

BUILDING

[Walkable Urban Thoroughfares](#): This Institute of Transportation Engineers' (ITE) guidebook provides guidance for practitioners to design major urban streets to support walkable and bikeable communities, compact development, and mixed land uses.

[Complete Streets Policy Framework](#): This Smart Growth America and National Complete Streets Coalition (NCSC) guidance document identifies the elements of a comprehensive Complete Streets policy to help communities develop and implement Complete Streets policies and practices.

[Moving to a Complete Streets Design Model: A Report to Congress on Opportunities and Challenges](#): This FHWA report to Congress identifies opportunities and ongoing challenges for Complete streets implementation and details its approach to furthering Complete Streets to improve safety and accessibility for all users.

[Complete Streets Transformations](#): This document provides examples of how to implement a Complete Street, specifically on arterials, using six scenarios.

[Proven Safety Countermeasures](#): This resource provides 28 countermeasures that are effective at reducing fatalities and injuries. The strategies fall into categories such as speed management, pedestrian/bicyclist, and intersections.

MATURING

[Designing for All Ages and Abilities](#): This National Association of City Transportation Officials (NACTO) guide builds on their Urban Bikeway Design Guide and sets criteria for implementing bike facilities for all ages and abilities to make the bike network safe and equitable for the majority of people.

[Association for Pedestrian and Bicycle Professionals Complete Streets Policy Statement](#): This guide provides policy statements on Complete Streets which includes example plans, key program elements, and additional resources.

[From Policy to Practice: A Guide to Measuring Complete Streets Progress](#): This Smart Growth America report provides guidance on what city/county/MPO/community partners can measure to support Complete Streets implementation, what the goals of the performance measures are, and how to choose metrics that support the program's goals and vision. They provide a menu of over 100 different metrics that fall under three categories: process, implementation, and impact.

[Tools to Diagnose and Solve the Problem](#): This web page provides many tools that can help analyze and understand pedestrian and bicycle safety to inform countermeasures and policies to address any problems.

LEADING

[Create Thriving, Activity Friendly Communities](#): This resource, developed by the National Collaborative on Childhood Obesity Research, provides an Economic Indicators Library that can help practitioners measure the economic benefits of active-friendly communities.

[The Metropolitan Transportation Commission's \(MTC\) guidance for compiling a "Complete Streets Checklist"](#): The Complete Streets Checklist is a form to help ensure local compliance with CS Policy and applicable laws. It is submitted to MTC online as part of a grant application process.

This research identifies [Complete Streets state statutes and summarizes qualitative analysis of state complete street laws](#). This study provides key insights into the legislative landscape of Complete Streets state laws.

Webinar Invitation

A vertical graphic with a blue background and a green footer. At the top, a white box contains the text 'NCHRP 08-128 Snapshots of Planning Practices' and 'MID-POINT ASSESSMENT AND FEEDBACK'. To the right is a green 'REGISTER HERE' button with a hand cursor. Below this, the words 'WEBINAR INVITATION' are written in large, bold, light blue letters. A text block follows, thanking participants and inviting them to a webinar. Below this is a list of four research topics. At the bottom, a calendar icon is next to 'WEDNESDAY 10.9.24' and a clock icon is next to '12:00-1:30pm CT'.

NCHRP 08-128 Snapshots of Planning Practices

**MID-POINT ASSESSMENT
AND FEEDBACK**

REGISTER HERE

**WEBINAR
INVITATION**

Thank you for your prior participation in NCHRP 08-128 Snapshots of Planning Practices. You are invited to an upcoming webinar to discuss mid-point findings from our practitioner interviews and focus groups.

We'll review research insights and seek your feedback on the practices, examples, and resources we've identified across the four research topics:

- Complete Streets
- Economic Analysis to Support Decision-Making
- Data Sharing for Performance Management, and
- Agency Collaboration on Freight Delivery in Local Communities.

 **WEDNESDAY
10.9.24**

 **12:00-
1:30pm CT**

Figure G-1. Webinar invitation.



APPENDIX H

Phase II Interview Guide

This document was distributed to interviewees in advance of the virtual interviews conducted during Phase II of this effort. As the research team’s understanding of Snapshot form and content evolved, so too did the information needs. This guide was revised to structure the conversation to solicit feedback on the draft Snapshots and to identify any gaps in the draft content.

The NCHRP Project 08-128, “Snapshots of Planning Practices,” builds on a previous research effort, NCHRP Project 8-36(120) and is producing Snapshot products across four research topics: Complete Streets, Economic Analysis to Support Decision-making, Data Sharing for Performance Management, and Collaboration on Local Freight Delivery.

The Snapshots outline key practices, examples, and resources for each topic along a spectrum. The spectrum shows how organizations grow over time by “designing,” “enhancing,” and “advancing” their programs. This research is intended to capture high-level national trends on these topics while being visually interesting and useful to practitioners. In this conversation, we hope to gather feedback on the key practices, examples, and resources we have developed across all four topics. The draft Snapshots are attached to this meeting invite.

Key Practices

- Are the practices placed at the right point on the spectrum? (e.g., do any stand out as more/less “advanced” than their positions on the spectrum implies?)
- Do any of these practices surprise you and/or reflect your perception of emerging practices?
- Are any key practices missing?
- In your view, what are the outstanding questions or future research needs?

Examples

- Are the practices placed at the right point on the spectrum? (e.g., do any stand out as more/less “advanced” than their positions on the spectrum implies?)
- Are there any examples missing from these examples?

Resources

- What types of resources are practitioners looking for on this topic?
- What resources do you currently use or have used in the past?

Abbreviations and acronyms used without definitions in TRB publications:

A4A	Airlines for America
AAAE	American Association of Airport Executives
AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
ACI-NA	Airports Council International-North America
ACRP	Airport Cooperative Research Program
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATA	American Trucking Associations
CTAA	Community Transportation Association of America
CTBSSP	Commercial Truck and Bus Safety Synthesis Program
DHS	Department of Homeland Security
DOE	Department of Energy
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FAST	Fixing America's Surface Transportation Act (2015)
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GHSA	Governors Highway Safety Association
HMCRP	Hazardous Materials Cooperative Research Program
IEEE	Institute of Electrical and Electronics Engineers
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITE	Institute of Transportation Engineers
MAP-21	Moving Ahead for Progress in the 21st Century Act (2012)
NASA	National Aeronautics and Space Administration
NASAO	National Association of State Aviation Officials
NCFRP	National Cooperative Freight Research Program
NCHRP	National Cooperative Highway Research Program
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
PHMSA	Pipeline and Hazardous Materials Safety Administration
RITA	Research and Innovative Technology Administration
SAE	Society of Automotive Engineers
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005)
TCRP	Transit Cooperative Research Program
TEA-21	Transportation Equity Act for the 21st Century (1998)
TRB	Transportation Research Board
TSA	Transportation Security Administration
U.S. DOT	United States Department of Transportation

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