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NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

NCHRP RESEARCH REPORT 1002

Metropolitan Planning Organizations

STRATEGIES FOR FUTURE SUCCESS

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2022

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

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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, under Agreement No. 693JJ31950003.

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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 1002

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The NCHRP Project 08-122 panelists were encouraged by the research team throughout the project to provide input on the draft surveys, literature summary, interim report, the rescoping that occurred during the pandemic, expert panelist candidates, and draft reports. They responded with gusto to provide the research team with invaluable insights from a range of perspectives.

FOREWORD

By Dianne S. Schwager
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NCHRP Research Report 1002: Metropolitan Planning Organizations: Strategies for Future Success, is a practical resource for metropolitan planning organizations (MPOs) and their state departments of transportation (DOTs) partners to help address their evolving roles and face many of the challenges in the 21st century. It provides strategies for adaptation and improvement that will be effective in a wide range of MPOs that vary in size, structure, resources, and regional context. In addition to MPOs, this report and the supplementary research deliverables will benefit state DOTs, key stakeholders, and partners as they collaborate to address future transportation and related needs of their communities.

MPOs, present in metropolitan areas of the United States for more than 50 years, were conceived and have persevered because transportation networks and travel operate at scales larger than any one city or county. The federal rules that form the underlying foundations of metropolitan planning at MPOs are fairly durable, but the MPOs have evolved and continue to change in response to local needs as well as national and global forces that pose challenges to MPOs. These challenges include changes in trip-making behaviors, technology, climate, land use, social order, and funding.

Under NCHRP Project 08-122, "Metropolitan Planning Organizations: Strategies for Future Success," the research team led by Metro Analytics was asked to develop a comprehensive resource to inform and guide the evolving roles and functions of MPOs in partnership with their key stakeholders for the 21st century, taking into account the diversity among MPOs such as population served, the complexity of the region (e.g., number of jurisdictions), the scope of responsibilities, governance structure, staff and financial resources, technical capacity, and level of interaction with stakeholders.

The research approach and products of this study were substantially shaped by the COVID-19 pandemic and its attendant impacts, shifting the research team away from more traditional case studies to conducting eight Regional Roundtables (focused discussions with MPOs and their state DOTs, transit operators, and federal partners) and eight Information Forums (webinars open to all MPOs and the public) to discuss important topics and assess the state of coordination with MPOs and their partners, respectively. The view at the time, while uncertain, created the sense of opportunity to understand at a first-hand level how MPOs were adapting in real time to these substantial challenges.

A centerpiece of *NCHRP Research Report 1002: Metropolitan Planning Organizations: Strategies for Future Success* is Chapter 3, which presents best-practice challenges and tools to address 12 important concerns of MPOs: social equity, financially constrained planning, inclusive community engagement, improved curb space utilization, emerging transportation-related technologies, changing travel patterns, changing demographics, incorporating resilience

into plans, evaluation of future uncertainty in planning, regional freight, staff retention at MPOs, and shared mobility.

In addition to this report, the research produced a searchable innovation database and eight short videos summarizing the eight topics addressed in the Information Forums conducted during the project. The database and videos can be downloaded from the National Academies Press website (www.nap.edu) by searching for *NCHRP Research Report 1002: Metropolitan Planning Organizations: Strategies for Future Success.*

CONTENTS

Note: Photographs, figures, and tables in this report may have been converted from color to grayscale for printing. The electronic version of the report (posted on the web at www.nap.edu) retains the color versions.

SUMMARY

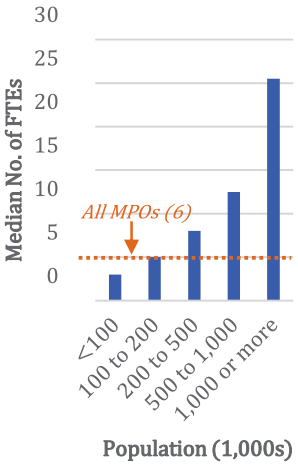
Metropolitan Planning Organizations: Strategies for Future Success

A History of Change and Adaptation

This report presents strategies to facilitate the future success of metropolitan planning organizations (MPOs) throughout the United States. MPOs have been a steady presence in the metropolitan areas of the United States for 50 years or longer in some instances. MPOs were conceived and have persevered because transportation networks and travel itself operate at scales larger than any one city or county. Sub-regional travel moves at this scale to take advantage of economic circumstances: people may choose to live further away from their jobs to afford a larger home; freight originates from distant ports or modes; and businesses locate at regional nodes or smaller towns to take advantage of savings in travel costs, access to consumers, or simply because it is cheaper than locating in the central business district of a large city.

These concepts and the federal rules that form the underlying foundations of metropolitan planning at MPOs are fairly durable assumptions, but the MPOs themselves have evolved in a myriad of ways to respond to localized needs over several decades of operation, including the size of staffing and other resources (see Figure S-1). Some MPOs are more involved in land-use decision-making to better link development practices and transportation services. Some are focused on system preservation, roadway expansion, or facilitating active modes of travel; smaller MPOs may be working hard to produce the basic long-range plans as well as guiding work programs, board meetings, and improvement programs that are stipulated by federal law.

MPOs and their member governments have endured, and even thrived, under substantive changes: performance-based planning, management systems, environmental justice, air quality conformity, trends toward more workers per household, trends toward preferences for automobile travel, and trends away from automobile travel to walking and biking. Priorities have shifted as well—from urban living to suburban and back to urban again; from shopping in malls to shopping online; from working in factories to offices or at home, a more common practice during the global pandemic starting in 2020.



Source: 2016 survey with 70% of MPOs responding; Kramer et al. 2017.

Figure S-1. Median staff sizes of full-time employees by size of population in planning area.

The New Challenges Are Different

With this degree of change and the durability of MPOs through it, the temptation is to gloss over the current challenges as simply the next wave in a recurring cycle of changes. However, several concurrent forces are posing unique challenges to MPOs now, in addition to some concerns that have not gone away. During this study, the United States experienced levels of political dissatisfaction and polarization that potentially influenced some of the engagement results. The Black Lives Matter movement is the latest attempt to raise awareness

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of persistent disparities in personal resources and opportunities for millions of Americans, some of which the TRB has publicly acknowledged are influenced by transportation-related decisions. Then, in early 2020 after this study had commenced, news came that hundreds of people had become sick in a province of China and that the virus, COVID-19, had the potential to spread rapidly to other places and people.

A Study of Adaptation Had to Adapt

The outcomes and products of this study were substantially shaped by the COVID-19 coronavirus; its attendant impacts shifted the research team away from more traditional case studies to conducting Regional Roundtables and Information Forums (webinars open to the public) to discuss important topics and assess the state of coordination with MPOs and their partners, respectively. The view at the time, while uncertain, created the sense of opportunity to understand at a firsthand level how MPOs were adapting in real time to these substantial challenges.

An example of this is the large survey conducted in early- and mid-2020 for this project (see Appendix E). About half of the 129 respondents gave their replies before the pandemic lockdowns occurred, and about half responded during the full lockdown. The responses showed some differences but also gave the study process some time to reconsider the planned Phase II work program and how it could be adjusted to this new reality. For instance, one such change was that expert panelists on eight very different, but often interconnected, topics that MPOs identified in Phase I research of the literature and early conference engagement replaced detailed case studies.

The MPOs frequently discussed in literature reviews (including the one developed for this project) are often large and possess resources and specialized talents not available to the majority of their peers, so input from a range of MPOs was sought throughout the study. A database of best practices, termed "Innovation Database," was modified to be more robust, and each of its 108 records is searchable by region and MPO size as well as keywords.

Since MPOs noted that communication and coordination with partners were challenged (an ever-present concern for many MPOs), eight Regional Roundtables were prepared and conducted involving people from a dozen states and nearly 20 MPOs with the intention of understanding how collaboration works and the best practices for making it better. In this way, at a time of heightened separation, canceled conferences, and two-dimensional communication across digital divides, outreach was conducted that benefited the research process and outcomes.

An unanticipated benefit, and one that the research team hopes becomes a more commonplace occurrence in large-scale studies like this, is that communication was actually strengthened as a result of the study. Important information was shared through Information Forums conducted during the study rather than simply absorbing the limited time and resources of MPOs and their partner agency staff through surveys and telephone interviews.

Finally, 12 issues were chosen to create the framework for the Toolkit for the 21st Century, which consists of two-page guides that, like the Innovation Database, are designed to be easily accessed and provide relevant resources to MPOs of varying sizes and contexts.

General Organization of This Report

After this summary, Section 1 of the report presents a description of the Innovation Database of best practices, short summaries of videos from the forums (both available online), and the Toolkit for the 21st Century (included in the report at the end of Section 1). These tools

were designed to be highly user-oriented, which was one of the conditions stressed during this project and by those providing input during the early stages of the study.

Section 2 delves into key issues facing MPOs now and in the near future, then shares how the study design was conceived—and then reconceived as a result of the global pandemic and cultural events—to address what MPOs told the research team were important matters. These topics were arranged into 12 functional areas and four categories (External Partnerships, Access to Resources, MPO Product Relevancy, and External Change Forces) to organize the preliminary findings of MPO issues. Key findings pertaining to these categories were derived from hours of discourse conducted during eight Regional Roundtables and eight Information Forums as well as an extensive review of related literature. Conclusions and directions for future research are followed by five appendices detailing the specific outcomes of literature reviews and engagement efforts.

SECTION 1

Strategies for Metropolitan Planning Organization Success

CHAPTER 1

Introduction

The MPO and the Moving Target

This report presents strategies to facilitate the future success of metropolitan planning organizations (MPOs) throughout the United States. The research recognized that although much has changed since the Highway Act introduced the vision of a cooperative, comprehensive, and continuing multimodal planning process (3C planning) for urban areas in 1962, the process continues to be central to metropolitan planning.

Little else remains the same. Even the seminal 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) seems of a bygone era as MPOs today grapple with an array of issues that were not anticipated 30 years ago. If the first 20 years of this century are an indication, MPOs will be challenged to stay abreast of emerging issues and opportunities to provide the visionary leadership their planning jurisdictions need to successfully navigate the uncertain waters ahead.

In approaching this research project, the research team and panel recognized the need to conduct a comprehensive, critical review of MPO strengths and weaknesses in light of 21st-century transportation issues, then identify ways of positioning MPOs throughout the United States for future success. Underpinning the approach was the recognition that MPOs, although starting from the same federal legislation and rule-making, have different resources, structures, and contexts that make some solutions a better fit than others.

This research project was initiated in the latter part of 2019 and was therefore significantly affected by the COVID-19 pandemic, which changed how the research was carried out and to some extent, what issues were addressed. Table 1-1 presents 12 topic areas developed from Phase I of the study and the impacts ascribed to the pandemic effects for each topic.

Objectives and Approach

NCHRP research projects benefit MPOs, state departments of transportation (DOTs), and key stakeholders and partners (including the public) by creating resources that are practical and meaningful. The stated goal of this research was to produce a comprehensive resource to inform and guide the evolving roles and functions of MPOs with strategies that respect the diversity of MPO size, structure, resources, and regional context as the 21st century unfolds.

Approximately 6 months after this research project was initiated, the project workplan was revised because of the effects of the COVID-19 pandemic. It became clear, for example, that the proposed in-person roundtables and case studies could not be conducted. The research plan modifications accelerated the interactions with MPOs and introduced virtual Regional Roundtables (gatherings of MPO staff and stakeholders) and Information Forums (webinars featuring expert panelists on eight topics and audience polling).

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Table 1-1. Examples of topic areas influenced by the global pandemic.

TOPIC	PANDEMIC IMPACT
Changes Presented by Technology (scenario planning, big data)	Mining/Utilizing/"Mashing" Data to Understand Changing Travel Patterns Incorporate Economic Modeling into Forecasting, Project Prioritization Impacts to the 2020 Decennial Census Revising Travel Models to Include Risk Assessment/Event Scenarios
Changing Demographics, Lifestyle Trends, and Travel Patterns	Changes to (declines in) Campus-Related Travel Sharp Decrease in Tourism (a planning factor) Sharp Increase in Bicycle/Pedestrian Infrastructure Slowing Down/Reversal of Urbanization and Large Corporate Offices Sharp Decrease in Air Travel
Freight Impacts (including effects of e-commerce)	Commercial Deliveries Down (not door-to-door retail) Re-Onshoring/Changes in Just-in-Time Delivery Approaches Logistics/Supply Chain Involvement Increasing (even in nonport areas) More e-Commerce and Delivery Conflicts (increase in door-to-door retail)
Resiliency Planning and Actions (including climate change)	Working with Private Sector to Ensure Mobility Service Continuity Economic Resiliency Ascending in Importance (equity issue) Dispersed Land Uses (opportunity for fringe, small-town, rural communities)
The MPO Role in Financing Projects and Using All Funds Effectively	Decrease in Federal/State Fuel Taxes and Funding Movement Away from Large, High-Cost Projects Shorter-Term Contracting Agreements for Planning, Design, Services
Emerging MPO Roles in Transit (including new technology and services)	Sharp Decrease in Ridership and Loss of Transit Services (equity issue) Acceleration of Microtransit/Mobility as a Service (MaaS) in Some Markets Increased Engagement with Telework Options
Staff Capacity (including number and technical proficiency)	Potential for Improved Retention due to High Unemployment/Market Uncertainty New Emphasis on Different Skills (telework, technical tools, MaaS, active mode) Move from Full-Time Employees to Part-Time, Temporary, and Contract Employees
The MPO Role in Financing Planning or Other Services/Operations	Bigger Role in Acquiring/Managing Funds and Projects Shifting MPO Services to Focus on Funding/Financing Projects and Services Movement Away from In-Person Meetings/Revise Bylaws to Allow Remote Voting
Responding to "IoT," On-Demand Services, Micromobility	Increase in Interest for MaaS and "Internet of Things" (IoT) to Supplement Traditional Transit Services Re-Positioning Ride Hailing/Push for Driverless Vehicles Ensuring Equity-Based Considerations in Technology Transportation Design
Supporting Affiliated Objectives, like Safety, Security, Economy, Equity	Sharp Increase in Economic Impact Involvement Adding Pandemic Response to Definition of "Security" (MPO planning factor) Supporting Dispersed and Disrupted Economies (low-income communities)
Collaboration/Engagement with Public, Stakeholders, Officials	Broader Range of and Reliance on Technology-Enabled Engagement Tools Sharp Decrease in Personal Engagement Techniques Collaboration with Nontraditional Health, Security, Service Agencies
Collaboration in Large Regions (including with other MPOs)	Motivation to Forge New/Strengthen Existing Partnerships Coordination with Federal/State Agencies on Service Disruption Contingency Plans "New Regionalism" and the Rise of Interconnected MegaRegions

Phase I—Research Approach

- **Task 1: Kickoff and Amplified Workplan.** Conducted official kickoff with the NCHRP Senior Program Officer (SPO), project panel, and research team to help refine the deliverables, schedule, and administrative tasks of the project.
- **Task 2: Integration of Past and Ongoing Work.** Developed a baseline understanding of existing research and resources and compiled examples of MPO innovations that will be useful to practitioners. A 325-record literature database and review were conducted (see summary in Appendix C). Based on preliminary findings from the literature search, an Innovation Database was developed with over 100 records of best practices searchable by topic, keyword, region of the country, and MPO size. The Innovation Database is available on the National Academies Press website (www.nap.edu) by searching for *NCHRP Research Report 1002: Metropolitan Planning Organizations: Strategies for Future Success*.
- **Task 3: MPO Outreach/Engagement.** Directly engaged MPO practitioners in online and in-person activities. The research team conducted presentations at three conferences in late 2019: Association of MPOs (AMPO), National Association of Regional Councils (NARC), and American Public Transportation Association (APTA) (see Appendix D). An MPO survey was launched before March 1, 2020, and remained open until July 10, 2020. The total survey response was 129 (30% of all MPOs), approximately half of which responded to the survey before lockdowns from COVID-19 occurred and half afterward. This dichotomy afforded an opportunity to compare responses to the survey during pre- and post-COVID eras (see Appendix E).
- **Task 4: Interim Report and Meeting.** Reviewed the first phase of the research and discussed how to reformulate the workplan to address opportunities and challenges presented by the global pandemic. Figure 1-1 is a graphic illustration that shows how the research project was redesigned as a result of the global pandemic.

Phase II—Development of Best Practices and Tools

- **Task 5: Eight Information Forums and Eight Regional Roundtables.** Conducted forums and roundtables from February 2021 to April 2021 to assess how MPOs and their partners

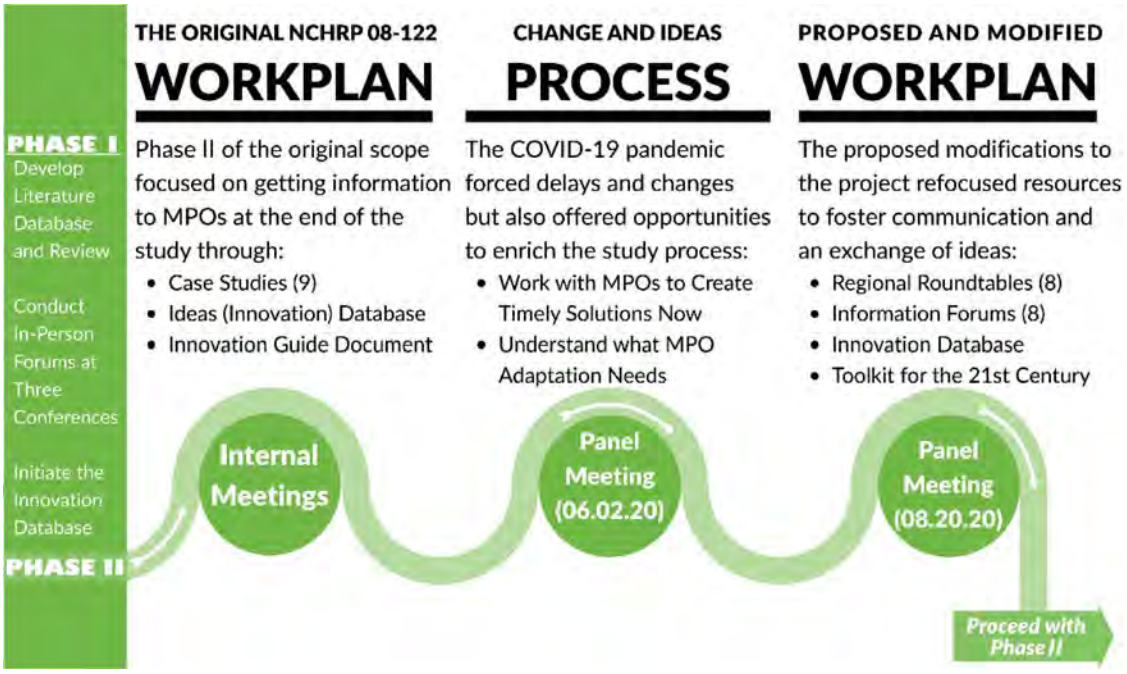

Figure 1-1. Modifications to Phase II to accommodate pandemic effects.

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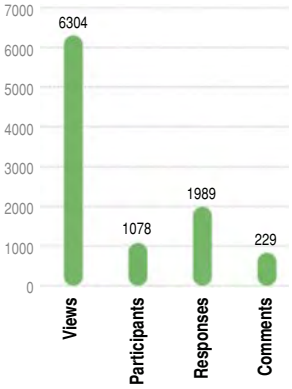

Figure 1-2. Information Forum participation.

Figure 1-3. Regional Roundtable participation.

Table 1-2. Participants in Regional Roundtables and Information Forums.

Regional Roundtables (8)		
Regional Roundtable Location	**Date (2021)**	**Roundtable Participants**
ID–MT–WY (multi-state)	10-Feb	4
DC–MD–VA (multi-state)	25-Feb	6
FTA Region 1	5-Mar	7
FTA Region 2	12-Mar	7
FTA Region 4	19-Mar	8
FTA Region 10	22-Mar	6
FTA Region 9	26-Mar	6
FTA Region 6	31-Mar	8

Information Forums (8)			
Information Forum Topic	**Date (2021)**	**Panelists**	**Attendees**
Micromobility	17-Feb	3	141
Funding of Projects and Programs	16-Mar	2	217
Social Equity	17-Mar	2	153
Engagement in the Time of COVID-19 and Beyond	22-Mar	2	112
Land-Use Shifts	23-Mar	2	133
Resiliency, for Real	30-Mar	3	46
MPO Staff Retention and Attraction	31-Mar	2	131
Integrating Technology into MPO Practice	29-Apr	2	114

were adapting during the COVID-19 disruption. This provided a rare opportunity to understand how MPOs were adapting in real time. Over 1,000 participants joined the eight Information Forums, providing valuable information to MPOs and their partnering agencies. The forums also served to gather information directly from panelists as well as indirectly through interactions (virtual). Two of the Regional Roundtables were conducted with three MPOs from adjacent states (Idaho, Montana, and Wyoming) with small- and mid-sized MPOs; and one with Virginia, Washington, DC, and Maryland (i.e., large MPOs). The other six Regional Roundtables were conducted with one to two MPOs from the same state and frequently included the FTA, the FHWA, and transit and state DOT representatives. Fifty-two professionals participated in the Regional Roundtables.

Table 1-2 summarizes and lists the topics and participation for each Information Forum and Regional Roundtable. The latter used the 10 FTA regions as a mechanism for distributing the roundtables geographically. Figures 1-2 and 1-3 illustrate the extent of participation in the Information Forums and Regional Roundtables.

- **Task 6: Toolkit for the 21st Century.** Created short, two-page information sheets on 12 topics, with best practices. Each was developed based on the Phase I literature review, Innovation Database research, and Phase II interactions with MPOs through the Information Forums and Regional Roundtables.
- **Task 7: Draft and Final Reporting.** Developed and includes this final report, supplemented by a searchable Innovation Database of best practices and eight short videos that present summaries of the Information Forums. The Innovation Database and videos are available on the National Academies Press website (www.nap.edu) by searching for *NCHRP Research Report 1002: Metropolitan Planning Organizations: Strategies for Future Success*.

Overview of Contents of the Report

The report is organized into two sections followed by the appendixes. This first section includes two additional chapters that describe the Innovation Database and Toolkit for the 21st Century, each providing strategies for the future success of MPOs. The second section contains three chapters that present the research undertaken during Phase I, Regional Roundtables, and Information Forums, followed by the final chapter of conclusions.

CHAPTER 2

Innovation Database

This chapter introduces the online Innovation Database that houses best practices as a practical tool for use by MPO practitioners. It integrates the findings and conclusions from both phases of this research. The literature review of 325 sources and survey of 129 MPOs completed in Phase I directly informed how the database was organized into major topics, regions, and MPO size. As such, the database has been developed so that it is useful to MPOs.

The database contains 108 examples of innovative responses to some of the most challenging planning issues facing metropolitan regions today. The database includes innovations and best practices from MPOs that range in size and location, with the goal of providing useful examples of planning practices applicable to any MPO in the nation. The purpose and use of this database are described in the balance of this chapter. The Innovation Database is available on the National Academies Press website (www.nap.edu) by searching for *NCHRP Research Report 1002: Metropolitan Planning Organizations: Strategies for Future Success*.

Purpose of the Innovation Database

The Innovation Database is a portable, searchable database that MPO practitioners can use to respond to current and future planning challenges. During early outreach at the NARC and AMPO conferences in 2019, two comments about the Innovation Database stood out: it must produce resources and information that a standard internet search does not, and it should not duplicate an existing resource. The literature review of 325 sources and survey of 129 MPOs completed in Phase I directly informed how the best practices were organized and how the practices could be searched by keyword, major topic, region, and MPO size (a surrogate for resource levels). As such, the database has been developed so that it is useful to MPOs in a variety of contexts.

In total, the database contains records from MPOs ranging from very small to very large and spanning the nation from coast to coast. Some records (innovations and best practices) are derived from non-MPO sources and are considered "national" in scope. The records represent a diverse range of MPOs so that smaller MPOs with fewer resources may find the database as useful as large MPOs with many resources to carry out innovative initiatives. The inclusion of examples from smaller MPOs makes the database more useful and ensures that small and large MPOs can learn from each other by reviewing the examples in this database.

Because the database is organized in a Microsoft Excel™ spreadsheet, it is easily searchable without any special knowledge, although applying column filters helps narrow searches.

Use of the Innovation Database

The research team initially established a goal of creating a portable and searchable database with a minimum of 100 records upon which MPO practitioners can draw inspiration as they respond to planning challenges. The research team primarily searched online for resources

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Table 2-1. Field descriptions of the Innovation Database.

Description of Innovation Database Table and Supporting Tabs
Columns A and B: Title and basic description of the type of best practice record information
Columns C and D: MPO or lead agency information and geographic location
Column E: State location of the best practice (or national if not state-specific)
Columns F through J: Primary and Secondary Topics and Keywords (Max: 3)
Column K: Description of project or process, noting why the work was done, resources, and so forth
Column L: MPO population expressed as a range
Columns M and N: The Region and MegaRegion where the source originated
Column O: Publicly cited contact person or contact information, if available at the time of writing
Column P: Primary source of information

to include, scouring MPO websites, AMPO conference proceedings, and federal government research databases to find documents describing innovative practices at MPOs and other transportation planning organizations. The search primarily focused on MPOs, but local, state, and federal level examples were also included in some instances due to the inherent relationship between MPOs and other government agencies and the similarities in certain planning goals and activities. When necessary, the research team contacted representatives from MPOs and other agencies to gather more information about a particular innovative practice.

Some innovations and best practices were also identified from the Regional Roundtables and Information Forums organized by the research team in March and April 2021. These events provided opportunities for practitioners to share information about their organizations' best practices, and the research team followed up with emails and phone calls after these events to gather additional information for the database when needed.

Resources discovered through research and outreach were placed into the Excel spreadsheet and formatted with columns for information about each document or tool. Each record contains a brief description of the resource, the resource type (presentation, research article, plan, etc.), and contact information to obtain more detail when available. The spreadsheet also contains information that can be used to search for resources by MPO size, geography, topic, and keywords. Field descriptions of the Innovation Database are shown in Table 2-1.

As noted, the Innovation Database was created in Excel and is available through links on the project web page for this research project.

CHAPTER 3

Toolkit for the 21st Century

Purpose and Use

The Toolkit for the 21st Century is a key deliverable of this project. The purpose of the toolkit is to present a series of challenges that MPOs face now or in the foreseeable future and to describe examples of how some MPOs have used innovative strategies to address those challenges. It is intended to serve as a resource for MPOs to understand how others are addressing key issues and to describe scalable, actionable steps MPOs can take to follow the examples and best practices summarized in the toolkit.

The toolkit consists of 12 two-page summaries of strategies for addressing key MPO topics (Table 3-1). Each two-page summary focuses on one topic and follows a similar structure, beginning by describing the MPO challenge, why it is important, and potential solutions. Next, the summaries describe examples of where the strategies have been used. They then list high-level steps that MPOs can take to employ the strategies. The summaries conclude with a resources section listing where more information on the applied examples and strategies can be found.

Toolkit Topics Layout

- Topic Title
- Topic Categories
- Challenge to MPOs
- Importance
- Example Strategies
- High-Level Steps
- Additional Resources

The examples draw from MPOs of varying sizes and locations throughout the United States. Some examples were identified through a literature review process, while others were cited as examples or highlighted during the project's Regional Roundtables or Information Forums. The solutions presented are scalable to MPOs of varying sizes. The Scalable Solutions graphic in each summary shows solutions that range from small scale that are easier, faster, and lower cost, to large scale that may require more time and resources.

The toolkit topics listed in Table 3-1 were modified from the high-level categories initially identified in the research to become (1) Internal Operations (i.e., MPO management), (2) External Influences, (3) Policy Issues, and (4) Partnering and Coordination. Icons on each summary indicate the corresponding category or categories.

This toolkit was developed in 2020 and 2021 during the COVID-19 pandemic and during a period of widespread protests focused on social equity concerns across a range of public sector practices, including law enforcement. While the summaries do not focus on the pandemic or protests specifically, they do acknowledge some recent trends and findings that are likely to be influenced, such as public participation strategies. These effects include, but may not be limited to, an increased reliance on digital communications and the rising stature of social equity in decision-making.

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Table 3-1. Toolkit topics by category.

No.	Toolkit Topic	Internal Operations	External Influences	Policy Issues	Partnering & Coordination
1	Social Equity	☑	☑	☑	☑
2	Financial Constraints		☑		☑
3	Inclusive Community Engagement		☑	☑	☑
4	Curb Space		☑	☑	☑
5	New and Emerging Technologies		☑	☑	☑
6	Changing Travel Patterns	☑	☑		
7	Addressing Changing Demographics		☑		☑
8	Resilience in Planning	☑	☑	☑	☑
9	Planning for the Unknown		☑	☑	☑
10	Regional Freight Issues	☑	☑	☑	☑
11	Staff Retention	☑	☑		
12	Shared Mobility		☑	☑	☑

NCHRP NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Topic: **Social Equity**
Category: **Internal Operations, External Influences, Policy Issues, Partnering & Coordination**

Addressing Social Equity in Metropolitan Planning Organization Transportation Planning

SOCIAL EQUITY

THE CHALLENGE

Social inequity is a critical issue nationwide, and metropolitan planning organizations (MPOs) are well suited to help address racial and socioeconomic disparities. MPOs have the opportunity to help mitigate some of the effects of social inequities as well as change the decision-making that may have contributed to them.

Tools that MPOs have for creating change include providing forums for regional collaboration, forming or participating in regional partnerships, setting regional goals and priorities, influencing the use of federal transportation funding, and monitoring regional data and performance toward goals that reduce future or mitigate existing inequity. The topic of social equity in MPO planning looks at how some MPOs have used these tools to promote greater equity and how the tools can be scaled to regions of different sizes.

WHY IS IT IMPORTANT?

MPOs have the influence, resources, opportunity, and obligation to help promote social equity through regional collaboration and distributing federal funding for projects.

POTENTIAL SOLUTIONS

Approaches to promoting social equity include establishing regional priorities that focus on equity, providing meaningful engagement with disadvantaged communities, and allocating funding equitably during project selection for MPOs' metropolitan transportation plans (MTPs), transportation improvement programs (TIP), and other planning activities. MPOs can also help form partnerships among agencies that control resources and decision-making.

Addressing social inequity can be categorized as relating to external influences (i.e., the social inequity that exists due to many contributing factors). Policy issues, partnerships, and coordination are ways to address this topic. Social equity concerns may extend to MPO staff and leadership positions that should reflect the diversity of the communities they serve.

Solution 1: Meaningful Engagement with Disadvantaged Communities. MPOs can develop outreach strategies that promote widespread involvement, particularly targeting populations that have not previously been engaged or have been negatively affected by transportation planning decisions. MPOs also can require more robust outreach in planning studies led by recipients of MPO funds. Outreach strategies include interviewing community leaders, identifying trusted local champions to promote participation from within communities, providing food and childcare at public meetings/events (provided that the project funding sources allow such use and/or obtaining separate funding if needed), attending other organizations' meetings/events, and using on-the-ground "street teams" to interact with residents where they live and work.

Solution 2: Transportation Project & Policy Impact Forecasting. A key function of MPOs is to develop the transportation plans that inform federal funding decisions for the region's transportation projects. MPOs can forecast potential effects on historically transportation disadvantaged communities, such as low-income and minority communities within the region as well as the region as a whole.

Solution 3: Framework and Goals for Addressing Inequity. This so-lution involves identifying social equity as an issue that MPOs have a role in addressing and then identifying goals and actions the MPO can take to promote equity. MPOs should then track and monitor performance toward goals. An example of social equity in fees collection and monitoring is the Penny for Pinellas funding program, which has been in effect since 1990 through several referendums and is used to fund transportation, parks, water quality, safety, and other improvements. This one-cent sales tax is not collected on groceries and some other essential goods and relies heavily on expenditures from visitors to the county. Importantly, Pinellas County monitors and reports on expenditures in easy-to-understand language and graphics.

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WHERE IT HAS BEEN DONE

Los Angeles Department of Transportation (LADOT) uses a Dignity-Infused Community Engagement (DICE) approach to public engagement that seeks to recognize and mitigate the negative effects of historically inequitable systems and decision-making and to engage all communities in meaningful discussion on these topics as part of the planning process. This approach acknowledges inequitable practices and identifies concrete steps (see below) for mitigating inequity and engaging everyone in the process.

The **San Francisco Municipal Transportation Agency's (SFMTA's)** Bayview Community-Based Transportation Plan created an equity index to locate projects where they would provide the greatest benefit to the largest number of vulnerable residents. SFMTA identified "Communities of Concern" using Census Block Group level demographic data and vetted it with input from community leaders and residents to develop a weighted equity index to spatially prioritize equity in the study area. The index was a key component of the project selection process.

The Metropolitan Council (the Minneapolis-Saint Paul Region MPO), in collaboration with the **Center for Economic Inclusion** and **Greater MSP (Minneapolis Saint Paul Regional Economic Development Partnership)**, created and adopted their Regional Economic Framework. A key element of the Framework is its nine strategy priorities, one of which is Racial Inclusion. The priorities are measured in the MSP Regional Indicators Dashboard that benchmarks how the region's economy is performing over time against 11 peer regions. Examples of the framework's measures for Racial Inclusion are workforce participation and unemployment rates disaggregated by race, racial employment gap, the racial wage gap, and the number/percentage of companies whose hiring practices reflect the racial and ethnic composition of the region.

HIGH-LEVEL DETAILS OF APPROACH

Elements of LADOT's DICE-approach are applicable to MPOs. This approach can be applied to all planning processes, from MTPs to corridor studies, modal plans, housing strategies, safety, and other activities. MPOs can begin by conducting a social climate analysis to understand cultural identity, demographics, social services needs, environmental factors, infrastructure conditions, and transit access. This analysis may include oral histories and interviews with resident leaders and community-based organizations. Next, MPOs can form targeted engagement teams, which may include paid partners in the community, to help guide the engagement process and reach previously excluded groups; street teams to canvass, phone bank, and participate in community meetings and events; and Resident Advisory Councils to help share information about the project with the community.

HIGH-LEVEL STEPS

1. Conduct a formal social climate analysis
2. Develop or support community teams, street teams, and resident advisory councils
3. Conduct capacity-building trainings
4. Facilitate restorative justice discussions
5. Conduct community engagement events and formal public comment opportunities
6. Identify and use anti-displacement strategies

MPOs can also host capacity-building training that promotes sharing of institutional knowledge related to plans and projects. MPOs can hold restorative justice sessions to talk about practices that have historically negatively affected communities and how to reverse these practices. Traditional outreach methods like small- and large-scale engagement events should also be used as well as formal public comment opportunities that allow engagement in-person and via phone, texting, live polling, public notices, and mailers, in case internet access is not available. Lastly, MPOs can identify other specialized efforts to include people of all demographic groups in the process and recommend implementation of anti-displacement strategies in MPO plans. Examples of anti-displacement strategies include community benefits agreements, community land trusts, inclusionary zoning, property tax abatement assistance funds, and home repair assistance funds.

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NCHRP NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Topic: **Financial Constraints**
Categories: **External Influences, Partnering & Coordination**

Financially Constraining a Plan When Funding Is Reduced or Unstable

THE CHALLENGE

Metropolitan planning organizations (MPOs) are funded largely through state and federal fuel, registration, and licensing taxes. However, funding for transportation projects is changing in the 21st century, with the increase in fuel-efficient, hybrid, and electric vehicles lowering revenues from motor fuel taxes. At the same time, the decline of brick-and-mortar stores has led to a reduction in funding from local sales taxes. These changes increase the financial burden on MPOs as well as departments of transportation (DOTs) to provide increasingly expensive transportation projects to support the efficient movement of freight and goods due to rising e-commerce, often without the necessary level of funding to do so.

Due to stay-at-home orders and increased telecommuting during the COVID-19 pandemic, funding from motor fuel tax collections was reduced further, thereby exacerbating the need for alternative funding sources and flexible long-term funding scenarios.

WHY IS IT IMPORTANT?

MPOs continue to face a lack of funding and an ever-increasing transportation project backlog. Through creative funding, they can identify methods that suit their needs.

POTENTIAL SOLUTIONS

MPOs around the country have started considering how to maximize their funding opportunities, with organizations identifying methods for adjusting revenue forecasts, using flexible funding, identifying public-private partnerships (P3s), and blending funding sources to meet project demands.

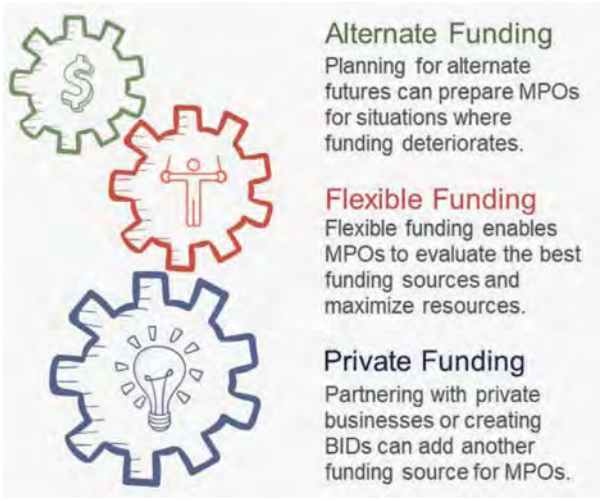
Some MPOs can partner with or even take a leadership role in guiding or forming Special Assessment Districts to create additional revenue sources. These districts can levy special taxes to cover services outside those a typical local government will cover. However, typically state legislation is required to enable the formation of such districts; for states without existing legislation, this would add another step in special assessment district formations.

Addressing funding shortfalls can be categorized as relating to external influences (i.e., funding shortfalls that exist due to many contributing factors). Funding methodology and partnering are means of addressing this topic.

Solution 1: Alternate Funding Scenarios. MPOs can develop alternative funding scenarios that account for economic recessions or other events that may cause funding to fluctuate over time. These scenarios can be used to identify how many of the prioritized projects can be implemented with reduced funding and create a plan for when there is a shortfall in funding.

Solution 2: Flexible Funding Scenarios. Various federal funding opportunities are available, and some projects may qualify for more than one opportunity. MPOs can maximize funding availability by creating a flexible funding scenario that balances funds across modes and ensures projects are matched with their best fit, thereby providing the best chance for projects to receive funding.

Solution 3: Private Funding Sources. Revenue streams such as impact fees or development fees can be used to help construct transportation projects that benefit developments, for example through Benefit Improvement Districts (BIDs). Additionally, by partnering with private entities, it may be possible to implement P3s and further stretch the public tax dollars.



WHERE IT HAS BEEN DONE

In its Southern Fulton Comprehensive Transportation Plan (SFCTP), the **Atlanta Regional Commission (ARC)** serving as the Atlanta MPO, developed an alternate future funding scenario to reflect an immediate 20% reduction in revenue levels, with 2 percentage points gained back each year for the next 10 years to reflect the longevity of a financial disruption event. These values were developed based on the 2008 financial crisis funding shortfalls. ARC has been tracking revenues in anticipation of potential shortfalls and continues to monitor them in case funding assumptions need to be adjusted.

Portland Metro created a Regional Flexible Funding Program that uses targeted questions to align submitted projects with regional goals, and, once identified, selects the appropriate Surface Transportation Block Grant (STBG) Program, Congestion Mitigation and Air Quality Improvement (CMAQ) Program, or Transportation Alternatives Program (TAP) funding suited for that project's implementation. Flexible funding maximizes project funding ability when revenues are reduced.

The **North Central Texas Council of Governments (NCTCOG)** evaluates funding from tolling, state highway funds, location transportation revenues, and federal funds to evaluate the best funding mechanism for each project. Part of this evaluation encourages "the overmatch of local money to create the flexibility to swap funds between a project funded with federal formula funds that require a 20% local match and other local projects." The overmatch from the larger project can be applied so that the smaller project is 100% locally funded, while the larger project still meets the federal requirement. By using more revenue sources, the increase in local funding opportunities can enable MPOs to make up for lost revenue in other areas or increase funding matches.

The **Capital Area Metropolitan Planning Organization** (CAMPO), centered in Raleigh, NC, created a funding program called the Locally Administered Projects Program (LAPP). This competitive program uses a holistic approach to identify and prioritize locally administered projects that use federal funds. The program establishes an annual target modal investment mix and provides training to eligible local jurisdictions.

HIGH-LEVEL DETAILS OF APPROACH

Alternate future funding scenarios, such as those employed by ARC, can help MPOs plan for uncertain future funding. This strategy can be used for all transportation improvement programs (TIPs) and other fiscally constrained plans. MPOs can begin by using data from previous economic recessions or other events that have caused transportation revenues to fall in their region. Once these values have been identified, the MPOs can develop a percentage value that reflects the expected reduction in revenues. This revenue reduction factor can be considered in an alternate funding scenario for the plan. Next, MPOs can hold workshops with cities and stakeholders to review the alternate funding plan and determine the effects it will have on the list of programmed projects for implementation.

HIGH-LEVEL STEPS

1. Document previous revenue shortfalls
2. Conduct workshops with local agencies to identify alternate funding sources
3. Create consensus on suggested decrease in revenue
4. Develop alternate project programming scenarios
5. Identify alternate revenue streams or revenue mixing to offset shortfall

Once a revenue reduction value has been reached, the MPO can work with regional agencies to create alternate programming scenarios that financially constrain the project list if needed. The next step is for the MPO to host workshops to identify alternate revenue streams within the region and to review project lists to determine how to maximize federal funding through positioning projects. These programs can include inviting stakeholders interested in P3 opportunities to review project lists for opportunities that benefit both parties. Additionally, a task force can be created within the MPO or with regional partners to create a review program that determines the best CMAQ, STBG, or TAP funding opportunity for projects to maximize their opportunities. This approach can be taken further by having the MPO create an internal review group that assists jurisdictions with writing grants or exploring other funding sources not controlled by the MPO.

WHERE TO FIND MORE INFORMATION

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NCHRP NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Topic: **Inclusive Community Engagement**
Categories: **External Influences, Policy Issues, Partnering & Coordination**

Employing Engagement Tools to Reach Any Audience

THE CHALLENGE

Inclusive community engagement is critical to the metropolitan planning organization (MPO) planning process. It is essential to addressing equity and dealing with demographic changes. How people communicate and access information is becoming more virtual, and that change has been accelerated by the COVID-19 pandemic. To ensure everyone has meaningful access to the planning process, MPOs must adapt to keep up with current trends in communication and outreach techniques.

With a wealth of resources available on effective engagement strategies, this document seeks to present a suite of tools that MPOs can use to reach the largest possible number of people in a way that includes everyone interested in participating.

WHY IS IT IMPORTANT?

Community engagement in the MPO planning process should be accessible to anyone through a wide variety of in-person and online platforms to ensure all perspectives are heard.

POTENTIAL SOLUTIONS

Provide inclusive and convenient solutions to engage communities by using a broad range of online and virtual tools, providing noninternet-based engagement opportunities, and crafting the overall engagement strategy to meet the needs of the entire community.

Conducting inclusive community engagement is related to external influences due to the changing realities of how people communicate and prefer to receive information and provide input. Policy issues are related in that MPOs must meet federal MPO planning minimum requirements for public involvement (e.g., public notice and comment periods). Finally, partnering and coordination are important for effective stakeholder and public engagement.

Solution 1: Virtual Community Engagement Resources. The traditional approach to community engagement in transportation planning has centered around in-person public meetings or open houses that occur at key milestones during the planning process. This approach requires attendees to make time and travel to the specified location at a set time. While there is still a role for this type of engagement, virtual engagement tools allow more people to participate in real-time events available online and throughout the planning process. There is a host of resources available for virtual engagement, such as virtual reality open houses, webinars, livestreaming, whiteboard collaboration, online surveys, online map commenting tools, etc.

Solution 2: Noninternet-Based Outreach Strategies. While virtual meetings and social media are effective ways to reach large numbers of people, noninternet-based outreach strategies are also necessary to allow participation of those who may not have internet access. Pop-ups, outdoor events, street teams, public computer lab sites, tele-town halls, texting, mailers, bus stop and transit station surveys, and traditional public meetings and open houses remain viable options for rounding out engagement strategies.

Solution 3: Targeted Strategies for Specific Groups. There is no one-size-fits-all approach to community engagement, and in most cases a combined approach of internet-based and noninternet-based strategies is needed and should be tailored to the specific community and process. There are publicly available maps online of digital inclusion related to households with internet access and number of computing devices [using the American Community Survey(ACS)] that can be reviewed to assist with targeted outreach strategies.

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WHERE IT HAS BEEN DONE

The **Atlanta Regional Commission (ARC)** and the **North Jersey Transportation Planning Authority (NJTPA)** have developed guides to help select public engagement tools. The ARC guide (Virtual Public Engagement Guide, Resources for Local Governments) contains checklists on how to ensure compliance with open meeting requirements, making meetings engaging to participants, avoiding technology pitfalls, adapting from an in-person to a virtual format, and choosing the best virtual public engagement platform to fit the need. The NJTPA Public Engagement Toolkit provides a searchable database of hundreds of techniques for certain audiences, such as seniors or millennials.

The **Miami-Dade Transportation Planning Organization** (TPO) developed a tool called the Transportation Outreach Planner. It includes a Demographic Reporting Tool to generate demographic reports within the TPO area, a Community Background Reports feature with historical and other information relevant to public engagement in select areas, and a Public Involvement Strategies guide covering a broad range of engagement topics.

As part of its 2050 Regional Transportation Plan (RTP) process, the **Chattanooga-Hamilton County/North Georgia Transportation Planning Organization** (Chattanooga's MPO) created brief, easy-to-understand explainer videos providing an overview of the RTP process and educational brochures about key RTP-related topics. The MPO is also looking into the logistics of hosting computer lab sessions where people can access online resources such as live and pre-recorded virtual reality open houses, videos, reports, interactive maps, and online surveys. These sessions will allow people without home internet access to see all the available information about the 2050 RTP and provide input.

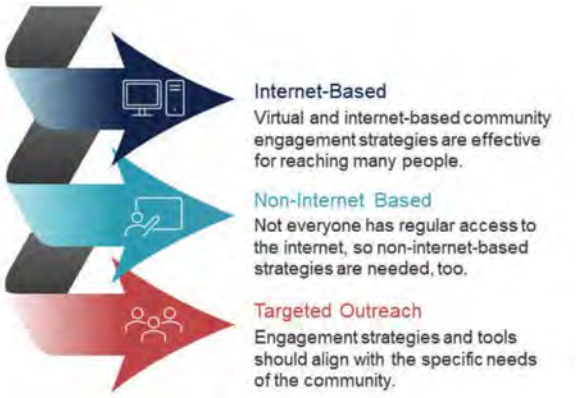
The **City of Charlotte** hosted a drive-thru event where residents could learn about and provide input on the Charlotte Future 2040 Comprehensive Plan. On October 31, 2020, the city hosted four sessions where attendees were directed to informational booths and were able to provide input via a mobile application. The final session included a screening of the movie *Back to the Future*.

HIGH-LEVEL STEPS

1. Research the demographics of the study area, including home internet access
2. Develop a public involvement plan that addresses the needs identified
3. Provide both internet-based and noninternet-based engagement opportunities
4. Record meetings and post online
5. Track and report on number of participants reached using each outreach strategy

HIGH-LEVEL DETAILS OF APPROACH

The first step in employing inclusive community engagement is to understand the demographics of the area and use that information to inform the public involvement plan. For example, I3 Connectivity Explorer is a free tool that pulls ACS data on home broadband subscription rates. If rates are lower for certain communities, noninternet-based strategies, like pop-up events and street teams, may be needed in those areas. Next, MPOs can offer a wide range of engagement activities, including in-person and online events and activities. In-person meeting presentations can be livestreamed and posted online for viewing during and after the events.



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NCHRP NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Topic: **Curb Space**
Categories: **External Influences, Policy Issues, Partnering & Coordination**

Strategies for Making Better Use of Curb Space in Metropolitan Planning Organization Areas

THE CHALLENGE

Curb space management is taking on increased importance due to competition for limited space for ridesharing, scooters, e-commerce, outdoor dining, and walking and biking. Cities face requests from all sides to increase space for making deliveries, charging scooters, concentrating pickup and drop-off points for rideshare, and other services.

This toolkit topic looks at how MPOs have used various tools to re-envision the use of curb space to maximize recreation, economic revitalization, and revenue for the transportation agencies involved.

WHY IS IT IMPORTANT?

Metropolitan Planning Organizations can research, recommend, and support local efforts to repurpose curb space and create permanent installations or programs for residents to improve quality of life and decrease congestion.

POTENTIAL SOLUTIONS

Potential solutions to repurposing curb space have existed for years, namely tactical urbanism (temporary changes to the built environment), parking days (use of parking spots for temporary mini-parks), parklets, and other grassroots programs that have led to permanent installations in many cities. These approaches can be championed by a community organization or through city officials and stakeholders.

The COVID-19 pandemic resulted in an uptick in cities taking advantage of lower traffic volumes to implement expanded sidewalks, bike lanes, dining areas (or "recovery zones"), and other solutions to get people outside and able to maintain social distancing recommendations. While these experiments may be temporary, others are evaluating methods for making these solutions permanent.

The MPO's perspective is typically one of policy and practice guidance, as regional agencies typically do not own the streets or sidewalks. As such, developing policies and sharing lessons learned that can enable local governments to implement changes to their infrastructure is a vital role. An example is development of regional curbside management plans or guidelines for implementation.

Solution 1: Meaningful Engagement with Communities. MPOs can develop outreach strategies that promote widespread involvement to generate ideas on how to repurpose curb spaces. Such outreach will focus on understanding how curb space is currently used and finding ways of maximizing opportunities within neighborhoods. Examples include opportunities for businesses to have pop-up shops, new or expanded recreational space, or delivery drivers to take advantage of off-peak delivery times.

Solution 2: Transportation Funding for Temporary and Permanent Installations. MPOs can develop transportation funding mechanisms that can be used to develop temporary, seasonal, or permanent installations. A lack of money for curb management can be overcome by merging curb projects with other improvements, such as roadway repaving, utility repairs, or intersection improvements.

Solution 3: Curbside Management Guidelines for Implementation. Determining where, how, and when to implement changes to the urban environment can be challenging. Through regional guidelines that provide information on how to implement projects at various levels, MPOs can empower local government agencies to envision new futures for their streets. These guidelines may include how to implement "flex zones" along a curb that change the use of the curb by time of day and by day of the week.

CURB SPACE

22 Metropolitan Planning Organizations: Strategies for Future Success

WHERE IT HAS BEEN DONE

The **City of Oakland** Slow Streets Program and **City of Minneapolis** Stay Healthy Streets Program were launched in spring of 2020 during the COVID-19 pandemic, aiming to alleviate overcrowding in parks and trails by providing walking and biking through closed roads, lanes, or parking spaces. These programs have expanded to provide outdoor dining, COVID-19 test sites, and pop-up shops for retailers. These temporary solutions can provide MPOs with the basis for a toolbox of options for which they can assist cities in implementing these projects.

Smart Zones have enabled the **City of Aspen** to team up with a company called Coord, which developed an app called Coord Driver to reserve curbside delivery zones. Drivers can reserve locations during select hours to improve delivery coordination, safety, and convenience. Additionally, the implementation of reserved curb space enables the City of Aspen to add an additional funding source to its toolbox.

The **[National Association of City Transportation Officials (NACTO)]** Parklets Guide and Tactical Urbanism Guide provide resources for cities to implement short- and long-term projects for replacing street amenities with parklets, dining spaces, bike lanes, bus stops, and other amenities. The **Open Streets Project** has an open streets toolkit that takes street repurposing step-by-step through planning, funding, marketing, and evaluation.

HIGH-LEVEL DETAILS OF APPROACH

MPOs can take actions to help local governments maximize their curb space. Through initial conversations with community organizations, stakeholders, business owners, and the public, input can be garnered to help understand what change is desired in the current built environment. Based on the feedback, MPOs can develop guidelines that help local governments implement curb space management strategies. These guidelines can include design standards for temporary pilot projects, safety requirements, traffic analysis considerations, and before-and-after data collection methodologies to document the outcomes of projects. This can also include guidelines for how businesses can utilize public infrastructure for outdoor dining or shopping, creating agreements for private enterprises to utilize the space either through a free use agreement or lease that can lead to additional city revenue streams.

HIGH-LEVEL STEPS

1. Develop and adopt regional curbside management and design guidelines
2. Identify curb space for implementation through community outreach
3. Fund temporary installation of projects
4. Document effects of temporary installations
5. Make the formal decision to remove or permanently install projects

MPOs can work to create funding mechanisms, such as a curbside management grant program, for various stages of project implementation, with criteria for taking a project from the pilot stage to

permanent installation. These criteria can be used to measure the before and after impacts of temporary installations and garner support for projects before funding is distributed. Additionally, funding criteria can be evaluated to determine if certain projects such as installing bike lanes or expanded sidewalks qualify for existing funding in the current program. To ensure that projects do not increase traffic congestion to unacceptable levels, create unsafe conditions, or violate standard design guidelines, MPOs can work to create a regional document for best practices based on existing work from NACTO and the Tactical Urbanism Guidebook.

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NCHRP NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Topic: New & Emerging Technologies
Categories: External Influences, Policy Issues, Partnering & Coordination

Preparing for New and Emerging Technologies in the Transportation System

THE CHALLENGE

Technology in the transportation industry has been evolving at a rapid pace. Discussions of the linkage between transportation and technology have shifted toward alternative fuel sources and electrification of vehicle fleets; updated traffic signal technologies; and connected and autonomous vehicles (CAVs). This evolution has made it difficult for state departments of transportation (DOTs), metropolitan planning organizations (MPOs), and local jurisdictions to anticipate or predict the future of roadway and highway infrastructure.

With this continuing evolution of transportation technology in recent years, MPOs are taking several initiatives regarding policy and implementation. This toolkit topic presents how some MPOs are planning, anticipating, and facilitating new and emerging technologies to improve safety and mobility.

WHY IS IT IMPORTANT?

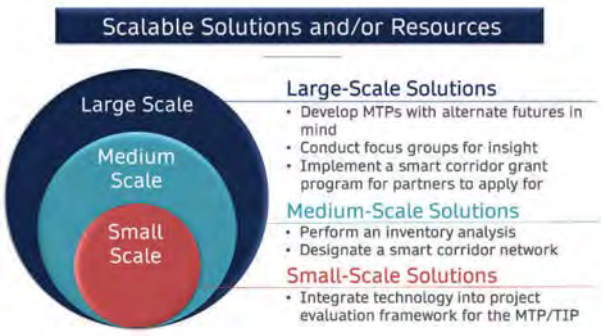
MPOs can educate and collaboratively engage with the community to develop a vision for the future, as well as develop "future proofing" strategies in anticipation of changes to come with new and emerging technologies impacting the entire transportation ecosystem.

POTENTIAL SOLUTIONS

New and emerging technologies relate mostly to external influences, policy issues, and partnering and coordination. They are also causing some uncertainty for the users of transportation services and agencies that provide them. However, MPOs can strategize and anticipate future changes and/or reactions by engaging industry leaders, stakeholders, community organizations, city officials, and neighborhood residents.

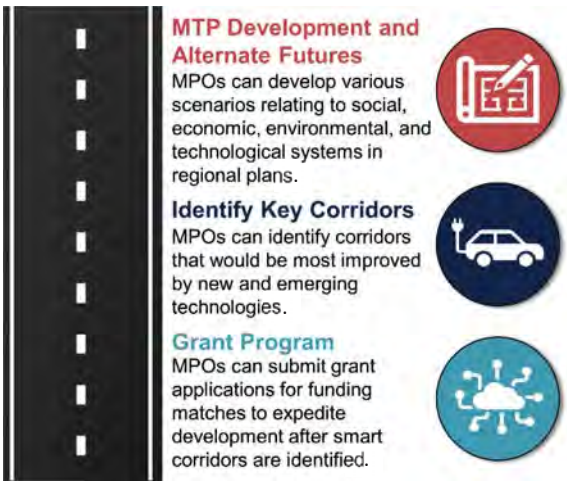
The 21st century has been marked by rapid technological changes, an abundance of accessible information, and an increasing ability to collaborate. The COVID-19 pandemic has underscored the need to be digitally connected and technologically innovative.

Solution 1: Develop Metropolitan Transportation Plans (MTPs) with Alternate Futures in Mind. MPOs should develop various future and uncertain scenarios or "alternate futures" relating to the social, economic, environmental, and technological systems in regional plans. Each alternate future should identify key external forces, what could happen to the transportation landscape, potential transportation projects to address these alternate futures, and then determine which projects would be good investments regardless.



Solution 2: Identify Key Corridors to Implement Technologies. MPOs can identify key corridors that could utilize emerging technologies that will create or enhance connections of residents to housing, employment, recreation, and capital. This strategy can include an inventory analysis of technologies such as fiber, broadband, software, and gaps in service as well as public spaces that could benefit from new or better broadband service. MPOs can expedite the decision-making process for where technologies should be placed.

Solution 3: Develop Smart Corridor Grant Program and Financing Assistance. MPOs and their partners can move technology-ready designs and projects higher on their prioritized list. A smart corridor grant program can be implemented that allows MPO partners to submit competitive grant applications requesting a funding match from the MPO for deploying technologies along smart corridors.



WHERE IT HAS BEEN DONE

The **Delaware Valley Regional Planning Commission (DVRPC)** developed a scenario planning document titled *Dispatches from Alternate Futures: Exploratory Scenarios for Greater Philadelphia*. The goal of the plan was to assess the conditions and trends of the existing transportation network and gain insight on potential outcomes that may occur in four different scenarios. DVRPC identified scenarios that include emerging technologies, such as autonomous vehicles (AVs), platooning, open-sourced technology, and the digitalization of transportation. This was completed in a collaborative and engaging environment among stakeholders and local residents. This scenario planning method can help MPOs to clarify their vision and strategy for technologies.

In **Florida**, a variety of stakeholders such as **Florida DOT**, **city of Orlando**, **MetroPlan Orlando**, and the **Central Florida Autonomous Vehicle Partnership (CFAVP)** have led initiatives related to emerging technologies in the transportation industry. The Autonomous Vehicle Mobility Initiative (AVMI) was developed to understand implications for future autonomous transit travel. Florida DOT is also leading Florida's Connected and Autonomous Vehicle Initiative, which is several projects involving vehicle-to-vehicle infrastructure, signal upgrades, and intelligent transportation systems (ITS). These involve partnerships with local municipalities and MPOs throughout the state. Smaller MPOs may rely on larger partners like state DOTs to lead technology efforts, advocating for training and integration of technology into planning and design processes.

In the **Atlanta Regional Commission's** Southern Fulton Comprehensive Transportation Plan, new and emerging technologies were incorporated into the plan's vision, goals, and objectives and project evaluation framework; inventory and needs assessment; and recommendations, including the proactive development of one of the first smart corridor networks in the country. A robust inventory of traffic signal locations, communication, and connected vehicle (CV) application abilities was conducted, as well as broadband/fiber locations. Additionally, smart technology solutions were recommended for several at-grade railroad crossings. As a result, system preservation needs were evaluated as well, including the recommendation of a policy to resurface freight corridors more frequently due to additional wear and tear from trucks.

HIGH-LEVEL DETAILS OF APPROACH

MPOs can facilitate discussions based on alternative futures or scenarios with industry leaders, community organizations, stakeholders, local jurisdictions, and the public. These initial discussions should provide more insight on the community's perception and guide local governments on future strategies, projects, and policies, such as signal priority and pre-emption, connected and autonomous vehicles, and vehicle electrification. MPOs should consider new and emerging technologies through the lens of equity ensuring that disadvantaged populations do not get left behind.

MPOs can provide guidance for a technology inventory analysis or perform the inventory themselves along key corridors. At a minimum, the analysis should include broadband fiber locations along corridors, traffic signal communication capabilities (to other signals, vehicles, and back to the transportation management center), remote signal timing software, and CV application software. The results of this analysis can be used to proactively identify a smart corridor network for future smart technology investments. Projects along a corridor identified in the smart corridor network could receive higher priority.

MPOs can evaluate and prioritize technologies within their MTPs based on performance measures like sustainability, cost, project readiness, return on investment, safety, public health, mobility, and equity. Technology projects and evaluation criteria can also be integrated into the Transportation Improvement Program (TIP) project selection.

HIGH-LEVEL STEPS

1. Develop and evaluate alternate futures and educate the public on potential implications
2. Gather input from community members on the perception of new technologies
3. Conduct inventory of current technology locations
4. Develop project evaluation and prioritization framework for MTP and/or TIP

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NCHRP NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Topic: **Changing Travel Patterns**
Categories: **Internal Operations, External Influences**

Changes in Travel Patterns and Accommodating New Modes of Transportation

THE CHALLENGE

How people live and work are changing, as is how they choose to commute or get around for everyday activities. Therefore, it is important for metropolitan planning organizations (MPOs) to be poised for these shifts, especially when Metropolitan Transportation Plan (MTP) horizons must look at least 20 years ahead.

According to 2018 American Community Survey data, from 2005 to 2018, telecommuting grew by 173% to account for 3.6% of the U.S. workforce. In addition, there has been a slight increase in active commuting to work by biking or walking in several urban areas with cities seeing a slight decrease in drive-alone figures. On a national level, though, no mode of transportation saw its share of total commuters change by more than 1.5%. According to the McKinsey Global Institute, 39% of employees in 2020 have the potential to work from home one or more days per week in the United States.

While driving alone remains the most popular method of commuting in the United States, data shows that urban centers have seen larger shifts in commuting patterns, some of which may be exacerbated by the COVID-19 pandemic. Furthermore, there is the potential for major shifts in travel patterns due to ridesharing, adoption of autonomous vehicles, changes in household size, and migration to more affordable housing options.

WHY IS IT IMPORTANT?

By understanding how travel patterns are changing MPOs can enact plans to focus on sustainable solutions to circumvent or encourage those patterns at a larger scale.

POTENTIAL SOLUTIONS

Changing travel patterns relates to internal operations [e.g., MPO Transportation Demand Management (TDM) efforts] and external influences. As one example of an external influence, addressing the COVID-19 pandemic challenged several MPOs to begin the process of quantifying changes in travel patterns. With a wealth of real-time travel information available to transportation agencies through mobile data and other passive data collection methodologies, it is easier than ever to develop dashboards and performance measures that track changes to travel patterns, even in near-real time.

For MPOs looking to encourage changes in travel patterns, a variety of initiatives within TDM programs seek to facilitate alternative commuting choices. Since many more employees have experienced the benefits of teleworking first-hand due to COVID, MPOs could consider incentivizing employers to continue to allow at least part-time teleworking. TDM programs can also incentivize employees to take transit.

Solution 1: Travel Dashboards and Data Methods. Through passive or active data collection methods, travel trends and dashboards can be created to understand how travel patterns are changing within a region. With real-time data availability, trends can be identified quickly and be used to update travel demand models or MTPs.

Solution 2: Refocusing Transportation Demand Management Efforts. To curb rising congestion and declining transit ridership, MPOs can sponsor regional TDM programs that encourage employers to allow telework post-COVID and encourage employees to take transit when not teleworking. Legislation may be required to support certain programs, such as tax credits for businesses that enable teleworking or encourage off-peak work or delivery hours.

Solution 3: Develop Scenarios and Policy. By documenting travel patterns over time, MPOs can develop scenario plans that reimagine the future. To guide these scenarios, MPOs can develop policies focused on education, outreach, infrastructure, and mode of travel to shape the future. Example policies include implementing broadband infrastructure to promote teleworking or adding charging stations to promote e-scooters and micromobility.

WHERE IT HAS BEEN DONE

With the onset of the COVID-19 pandemic, the **Waco Metropolitan Planning Organization (WMPO)** used the Maryland Transportation Institute's (MTI) web-based platform [Regional Integrated Transportation Information System (RITIS)] to quantify changes in travel patterns. Through their use of readily available data, the Waco MPO has set itself up to track yearly changes in travel patterns that can be used to understand how travel trends today may impact future transportation projects. **San Francisco's Metropolitan Transportation Commission (MTC)** also developed a data collection methodology, utilizing INRIX Real-Time travel data to create a 511 system that provides real-time traffic information and updates while also sharing the data with public agencies at no cost to assist in their planning.

There are several initiatives nationwide at the state and local levels to encourage telecommuting, biking or walking, ridesharing, and taking transit. However, as alternative modes of transportation continue to shift rapidly due to technological improvements, MPOs can begin to perform scenario planning to incorporate these trends into future projections. The **Massachusetts Bay Transportation Authority (MBTA)**, in conjunction with MassDOT, has several scenario developments that evaluate how shifts in employment and travel behavior, primarily teleworkers by industry and teleworking days per week, will impact future transportation networks.

The **Miami-Dade Transportation Planning Organization (TPO)** implemented a telecommute study to analyze the potential for telecommuting as a strategy to flatten the congestion curve in Miami-Dade County. The study identified which populations have the potential to use this strategy and how effective it would be at lowering congestion. To promote this mode countywide, the TPO implemented several policy recommendations that included creating an education and outreach pilot to monitor success metrics; implementing telecommuting elements in statewide plans; and implementing broadband initiatives within infrastructure projects, including transit, to promote telecommuting.

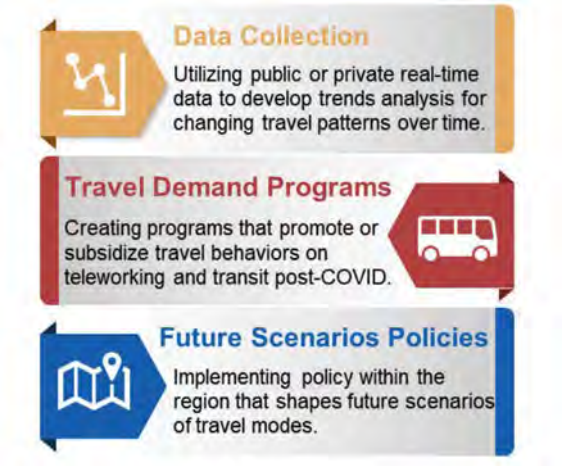
HIGH-LEVEL DETAILS OF APPROACH

MPOs can use publicly available data through programs like MTI's RITIS or seek private data from cell phone data providers or vehicular data that can be used to create dashboards recording travel trends and real-time information. These platforms can be shared with other regional partners to ensure all planning agencies have access to current data.

HIGH-LEVEL STEPS

1. Determine the best source for data related to travel trends
2. Perform trend analyses for targeted travel areas
3. Identify travel demand programs that encourage or discourage certain travel patterns
4. Implement policy that shapes future travel mode shifts

Once the changes in travel patterns have been analyzed, MPOs can begin analyzing both TDM strategies and policies to further encourage or discourage these patterns. For increased biking and walking, additional funding can be appropriated to bridge gaps in bike lane or sidewalk networks within areas where these patterns are found. Additionally, as modifications are made to the transportation network, MPOs should continue to monitor changes in travel patterns based on these direct impacts to ascertain their expected outcomes in other locations.



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NCHRP NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Topic: **Addressing Changing Demographics**
Categories: **External Influences, Partnering & Coordination**

Changing Demographics Accounted for in Plans and Processes

THE CHALLENGE

Cities and regions have seen their demographics change over the past decade due to new trends in where people want to live, work, and play. The COVID-19 pandemic also affected commuting patterns and housing as well as workplace location decisions.

Metropolitan planning organizations (MPOs) rely on accurate population, housing, and employment forecasts to plan. Ensuring they have the most relevant data is critical to their success. With changing demographics and the amount of data generated today, it is no longer acceptable to only track changes once every decade. With the appropriate technologies and data sources, MPOs can monitor these attributes more often to better inform planning decisions. Additionally, it is crucial that MPOs adjust their methods of outreach to ensure they are capturing data from new demographics or hard-to-reach groups that can provide valuable insight into what their communities need and desire.

WHY IS IT IMPORTANT?

MPOs base decisions regarding funding and transportation investments using demographic data as a major input.

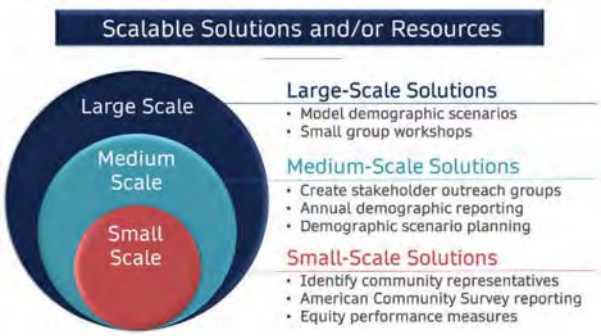
POTENTIAL SOLUTIONS

Several MPOs are using new methods for tracking demographic changes within their regions. These methodologies include modifying outreach techniques to incorporate environmental justice and other vulnerable populations, focusing on outreach that works best for these communities.

In addition, the use of weighted forecast scenarios for population demographics in models has allowed some regions to forecast changing demographics and plan for these scenarios.

These forecasts can be enhanced with performance measures that evaluate how a proposed plan or individual projects can cause displacement. MPOs can then find ways to encourage development where infrastructure and environmental impacts are most favorable. Since MPOs seldom if ever directly control zoning or site development decisions, addressing changing demographics requires partnering and coordination with local governments.

Solution 1: Update Outreach Techniques. To ensure that all groups within a region are reached, it is imperative that MPOs first lead an effort to identify all vulnerable populations meeting agreed-upon criteria or thresholds living within an area before developing outreach plans. Once the MPO has identified new demographic groups, or shifts in demographic concentrations or neighborhoods, an outreach plan can be tailored to the most effective outreach strategies.



Solution 2: Tracking Demographic Changes. Assessing how demographics may change in the future is critical to ensure housing, employment, transportation, and land-use plans will incorporate these changes. The changes can be tracked by monitoring programs that evaluate population, housing, and other growth trends on a yearly basis. The findings can be incorporated into models to account for how populations will change over the course of the model forecast, using free data from the U.S. Census Bureau American Community Survey or other data sources.

Solution 3: Equity Performance Measures. To ensure that MPO plans do not marginalize communities, plans should incorporate performance measures that ensure investments do not create additional displacement pressures. These metrics can be used at the regional or project level to understand how decisions can affect communities of interest.

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WHERE IT HAS BEEN DONE

The **Metropolitan Washington Council of Governments (MWCOG)** has evolved a procedure for coordinating with its many local government members to update population and employment forecasts. Called the Cooperative Forecast, updates are done on an irregular basis with major updates occurring after Census releases. While each member government conducts its forecast differently, county and regional control totals and a steering body that meets regularly help coordinate the process. It's a large MPO, but this methodology can be applied to smaller regions as well.

Skagit Council of Governments (SCOG) developed a planning policy in 2016 to begin a regional program monitoring population and employment growth in Skagit County. The Growth Monitoring Program provides the SCOG with annual information on how, where, and why population, housing, and employment growth is occurring. This data is used to support policies for investments and estimate future trends.

Portland Metro has seen its minority populations increase from 11% to 26% between 1990 and 2010 and found that long-range model projections that assume similar racial profiles to the present become very inaccurate, especially as the forecast extends farther into the future. To account for this, Portland Metro has developed four county-level population growth scenarios that project future racial and ethnic dispersion. These scenarios, when combined with other model projections, can then be used to understand how projected growth scenarios can affect investment decisions.

The **Metropolitan Transportation Commission (MTC) for the San Francisco Bay Area** has a planning area that became "majority-minority" (non-white populations outnumber white populations) in 2000 in an ongoing trend. The housing affordability issue facing the San Francisco Bay Area has caused the displacement of low-income and minority households throughout the region. MTC worked with a Regional Equity Working Group to develop six equity measures used to assess project performance and the performance of the full regional plan scenarios: adequate housing, reduced displacement, economic vitality, equitable access, transportation costs, and workforce access. These equity measures are then used to determine how the projects and plans will affect populations identified as being most at risk.

HIGH-LEVEL STEPS

1. Determine the best method for tracking demographics
2. Incorporate demographic data into models and plans
3. Form outreach groups for including demographic groups
4. Develop equity performance measures for evaluation
5. Create mitigation plans for groups that are affected by projects or plans
6. Conduct monthly or yearly outreach reports to track effectiveness of outreach strategies by demographic group

HIGH-LEVEL DETAILS OF APPROACH

While county, metropolitan statistical areas, and other large geographies have frequent data updates, smaller units of geography often rely on U.S. Census-based data. Developing a method that can be repeated often, uses local data and engagement inputs. and is cost effective will be critical to decisions that reflect changing conditions. As MPOs begin tracking how demographics are changing within their regions, outreach groups to the affected communities and jurisdictions can be formed to assist in understanding what can be changed to prevent displacement.

By developing thoughtful equity measures, MPOs can create a way to automatically review the impacts of projects and plans in a quantitative way that informs planners of needs to modify proposed investments. Potential equity measures include providing adequate housing based on income levels, reducing transportation costs, increasing access to job opportunities, or reducing environmental impacts to minority areas. These measures can be used to inform MPO mitigation plans that work to protect these identified communities and implement plans that deliver projects better suited to these areas. To ensure that the MPO's message is being disseminated among the population, monthly or yearly outreach reports can be conducted to track which populations have been reached and what methods work best for contacting each demographic group and geographic area.

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NCHRP NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Topic: **Resilience in Planning**
Categories: **Internal Operations, External Influences, Policy Issues, Partnering & Coordination**

Incorporating Resilience in Metropolitan Planning Organization Planning

THE CHALLENGE

The concept of resilience in MPO planning encompasses many strategies and policies to mitigate or reduce the impacts of disruption to the transportation system, which can be natural or human caused. Examples are hurricanes, flooding, wildfires, infrastructure failure, economic changes, power outages, and cybersecurity breaches. MPOs can incorporate resilience measures in their project evaluation and scenario planning processes. This toolkit shows how MPOs are addressing resilience in their processes and plans.

WHY IS IT IMPORTANT?

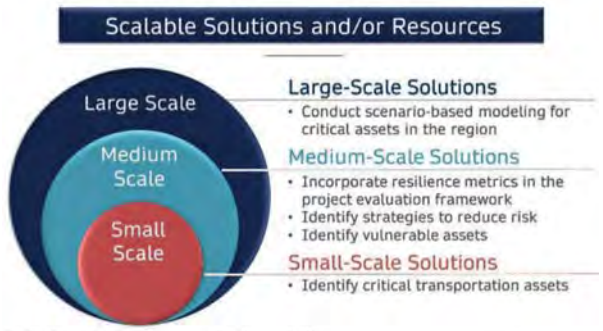
MPOs can incorporate new strategies to better anticipate external forces or shocks to the transportation system that occur with natural and human-caused hazards.

POTENTIAL SOLUTIONS

Addressing resiliency can be categorized within internal operations, external influences, partnering and coordination. Resilience planning involves the integration and cooperation of agencies at the federal, state, regional, and community levels. MPOs are uniquely positioned to increase their role in response and recovery of such events. MPOs are most familiar with the critical assets in the transportation system at a regional scale, as well as the stressors and hazards that pose the biggest threat.

Existing and potential future stressors, shocks, and external forces have intensified the need for MPOs to assess hazard-related vulnerabilities for infrastructure in the area. MPOs can take additional steps by compiling data (assets, temperatures, precipitation, air quality, etc.) and identifying strategies to mitigate future risk.

Solution 1: Identify Critical Transportation Assets and Establish Resilience Goals and Metrics in the Transportation Planning Process, Framework, and Project Prioritization. MPOs can develop resilience-related goals to incorporate into their metropolitan transportation plans (MTP). Once critical transportation assets have been identified, evaluation criteria can be used to prioritize and deliver projects that mitigate risks and provide redundancy to those critical transportation assets. Performance measures can also be evaluated, such as centerline miles of roadway on evacuation routes operating at or better than the adopted level of service, greenhouse gas emission levels, travel delay times, and pavement conditions.



Solution 2: Perform a Vulnerability Assessment. MPOs can perform a vulnerability assessment by identifying potential threats (flooding, hurricanes, wildfires, etc.) that could occur and affect critical transportation assets. The Federal Highway Administration (FHWA) has developed the *Vulnerability and Assessment Framework*, which MPOs can use to identify risks associated with infrastructure assets and natural hazards. The Vulnerability Assessment assists MPOs in understanding existing conditions, climate sensitivities, and future needs of the transportation system. Typically, identification of critical and vulnerable assets is done together. However, due to variabilities in MPO resources, we have separated the identification of critical assets as an earlier step that requires fewer resources.

Solution 3: Identify Adaptation and Mitigation Strategies and Use Scenario-Based Models to Compare with Baseline Scenarios. MPOs can identify strategies to mitigate hazards to transportation assets. They can use scenario modeling to understand which strategies are most effective in reducing and absorbing risks to transportation infrastructure compared to a trend scenario where no steps are taken to promote resilience in the transportation system. Such scenarios may include power outages, security operations, or extreme weather events.

RESILIENCE IN PLANNING

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WHERE IT HAS BEEN DONE

The **Southwest Louisiana (SWLA)** MPO is centered on Lake Charles, part of a heavily trafficked freight corridor along I-10 and encompassing much of Calcasieu Parish. During their MTP update, a new project priority system was developed based on public and committee inputs. This new system included a resilience aspect by creating a grid of varying-sized cells mapped over the planning area and populated with information from a land-use suitability analysis (LUSA), including stream crossings, flood-prone areas, low infrastructure capacity, and other vulnerability factors. Projects that crossed high-vulnerability cells received a lower score; projects that facilitated emergency routing, bettered access to low-income/minority populations, and improved freight routes got a higher score.

The **FHWA** offers funding and assistance to DOTs and MPOs to identify resilience solutions through resilience pilot programs. Below are some examples.

In **San Francisco**, the **Metropolitan Transportation Commission (MTC)** was awarded FHWA Climate Change Resilience Pilot funding to complete a vulnerability assessment. The infrastructure assets included I-80, I-880, State Route 92, two bridges, passenger rail, and freight rail. The goal was to collect data, gain insight on storm event exposure, and identify climate adaptation options and strategies for the critical infrastructure and surrounding areas. MTC completed baseline scenarios to show how each asset would be affected by various levels of sea-level rise if no action is taken to adapt. The MPO also compared those outcomes to scenarios where five adaptation strategies were used. Overall, MTC developed a vulnerability assessment that identified strategies to best adapt to sea-level rise.

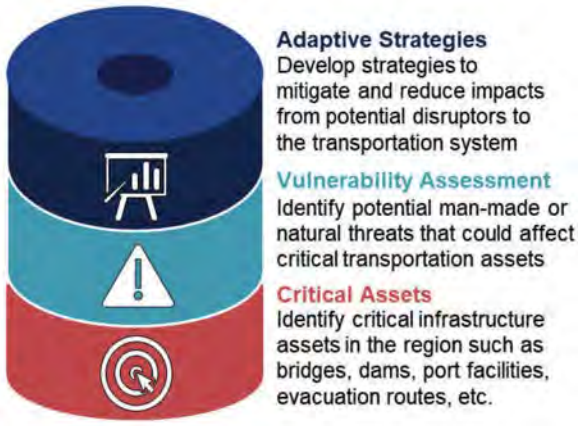
The **Chattanooga-Hamilton County/North Georgia Transportation Planning Organization (TPO)** obtained technical assistance from FHWA Climate Change Resilience Pilot funding to support incorporating resilience into the 2050 Regional Transportation Plan (RTP). The goal of the pilot was to identify potential project recommendations and strategies to address hazards affecting the transportation system. The TPO and FHWA held a two-day resilience workshop early in the RTP planning process with approximately 100 invited participants. The workshop defined resilience in context of the 2050 RTP; existing and past resilience efforts in the region; the development of an RTP resilience objective; adaptation and mitigation strategies; example vulnerability and risks of RTP and TIP projects; and resilience project evaluation measure(s). As a result, resilience will be threaded throughout the development of the 2050 RTP.

HIGH-LEVEL STEPS

1. Identify critical transportation assets
2. Assess vulnerability by identifying hazards or stressors affecting the region
3. Identify adaptive strategies to mitigate or reduce risk, impact, and vulnerabilities
4. Model scenarios that compare trend scenarios and scenarios representing environmental or human disruptions
5. Prioritize and fund projects and policies that promote resilience

HIGH-LEVEL DETAILS OF APPROACH

MPOs can address resilience and protect critical infrastructure and assets. The first step is to identify critical and vulnerable assets such as major highways, evaluation routes, bridges, rail, and intermodal ports. Hazard-related data, such as precipitation, temperature, and sea levels should be compiled to understand the potential effects on critical infrastructure. Population data and social infrastructure near or reliant on critical transportation assets can also be incorporated. MPOs can further prepare for resilience in the transportation system by identifying adaptation strategies to mitigate and reduce the impacts from potential stressors, shocks, and events. The adaptation strategies can range from physical construction projects, governance and coordination between agencies, regional strategies to protect critical infrastructure and surrounding assets, or even scoping studies to better understand potential risks. Scenario-based modeling can assess potential needs and strategies. The scenario-based modeling process compares the outcome(s) of a given strategy to a baseline scenario. Lastly, MPOs can prioritize and fund projects and policies that promote resilience.



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NCHRP NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Topic: **Planning for the Unknown**
Categories: **External Influences, Policy Issues, Partnering & Coordination**

Evaluating Future Uncertainties for Metropolitan Planning Organizations in Planning

THE CHALLENGE

Forecasting future conditions in MPO planning processes has become increasingly complex due to changing social, technological, environmental, economic, and political factors that influence how regions develop. MPOs are addressing these changing dynamics in a variety of innovative ways. For example, "what if" scenario planning has gained prominence by helping to prepare for potential changes ahead of time such that MPOs can better respond to or benefit them. Experts can help guide the planning process to consider potential transformative changes occurring over the 20-year or longer planning horizon. These changes can encompass opportunities as well as challenges. MPOs must determine how to allocate funding to ensure infrastructure and development is prepared to handle the future changes.

WHY IS IT IMPORTANT?

It is important for MPOs to ensure that their limited resources for transportation investments will stand the test of time. Understanding and planning for the potential effects of changes in future mobility promotes the long-term success and relevance of these investments.

POTENTIAL SOLUTIONS

There have been several reports generated through the American Planning Association (APA), as well as NCHRP Research Report 750: Strategic Issues Facing Transportation, a six-volume series, that address incorporating future changes into comprehensive plans. These reports address several topics, including autonomous vehicles, ridesharing, micromobility, climate effects, resiliency, equity, health, and other topics that may be relevant to a given region. MPO staff can also host local experts to brainstorm future scenarios that may impact the region given their field of expertise. Additionally, MPOs can prepare plans that address "what if" scenarios through creating collaborative planning processes that work to analyze multiple uncertainties and implications. These future viewpoints can be used to clarify visions and gain insight into keeping the region on a desired path.

Planning for the unknown is related to external influences, policy issues, and partnering and coordination. Being unknown does not mean that there are no methods for gathering information and inputs that can help define the magnitude and direction of potential change or outcomes. The following are some solutions that can be used by MPOs to bring clarification to unknown factors.

Solution 1: Develop Trend Analyses. Utilizing available data sources in air quality, transportation mode shifts, and other relevant information, MPOs can evaluate how areas have shifted over time and in some cases, make forecasts on future expectations. These future expectations can then be evaluated by expert groups, compared to near-term observations, or developed into alternative scenarios to determine their potential impacts.

Solution 2: Create Future-Focused Expert Groups. Some trends are more recent or have not occurred yet. These trends can be discussed as part of local, regional, or statewide focus groups of experts on areas of concern to the MPO. These groups can be one-off workshops or recurring meetings that allow MPO planners to engage with experts and remain abreast of current information. Colleges, universities, and nonprofit organizations in the area are excellent resources to engage in this process. These future scenarios can then be used in a backcasting exercise in which the differences between the vision and reality are identified as well as actions that need to be taken to bridge the two.

Solution 3: Develop Alternative Scenarios. Incorporating future scenarios into metropolitan transportation plans (MTPs) can help guide MPOs in planning for their desired futures. Through these scenarios, the consequences of certain actions can be quantified or qualified to better prepare agencies for what may occur. It is important to test these scenarios against near-term observations and explain differences in long-term forecasts if they exist.

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WHERE IT HAS BEEN DONE

The **Los Angeles Department of Transportation (LADOT)** and **Seattle Department of Transportation (SDOT)** have developed functional transportation plans that cover policy frameworks for implementing autonomous vehicles (AVs) within their jurisdictions. These plans include policy frameworks for addressing equity, pilots and partnerships, infrastructure and street design, mobility economics, and land use and building design. The plans work to ensure that future infrastructure investments and projects consider how the growth of AVs can impact the jurisdictions and ensure that planned transportation infrastructure projects are prepared to handle AVs.

Delaware Valley Regional Planning Commission (DVRPC) developed an exploratory planning exercise, Dispatches from Alternate Futures: Exploratory Scenarios for Greater Philadelphia. Regional and transdisciplinary experts, called the Future Working Group, generated multiple views of the future by assessing uncertainty within a changing environment to understand what conditions or events may emerge and their likely outcomes. DVRPC is planning a third step within its 2050 long-range plan that will identify potential actions to respond to, or benefits that may accompany, these uncertainties.

Valley Visioning is a three-part outreach path to plan for the future of Utah County, Utah. First, the county conducted listening surveys to understand how the public thought growth would occur. Second, growth scenarios were developed accounting for the survey concerns with scenarios such as business as usual, organized growth around mixed-use centers, westward growth, and urban infill. Each scenario incorporates housing, transportation, open space, water, resilience, workforce, education, and air quality scenarios. Finally, these scenarios were used to model the transportation, land use, and water consumption outcomes that could be drafted into a final vision for Utah County.

The **APA** has also developed comprehensive plan standards for considering how AVs can be addressed in the planning process, plan context, and implementation phases. These standards cover six principles consisting of a livable built environment, harmony with nature, resilient economy, interwoven equity, healthy community, and responsible regionalism. These principles can be researched in conjunction with *NCHRP Research Report 750: Strategic Issues Facing Transportation* reports, which explore freight movement, climate change, technology, sustainability, energy, and other trends to demonstrate the importance of foresight in navigating a rapidly changing future.

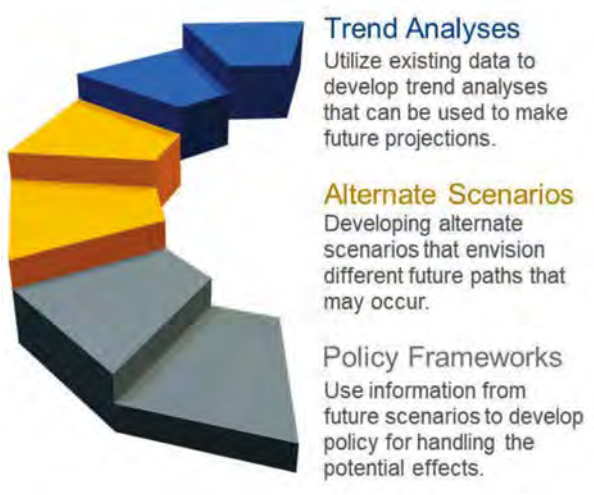
HIGH-LEVEL STEPS

1. Use existing data to evaluate trend analyses in areas of interest such as travel mode or climate change
2. Create expert working groups or public surveys
3. Use feedback to develop alternate future scenarios
4. Incorporate scenarios into long-range plans as recommended policies or action items

HIGH-LEVEL DETAILS OF APPROACH

Given the availability of disciplinary experts in large metro areas, forming expert groups to help envision the future of cities may be a viable solution for agencies. Smaller agencies may be able to form virtual expert groups that pull interested subject matter experts to discuss the future of regions from a distance.

With the information acquired, MPOs can begin the process of developing and evaluating "what if" scenarios to incorporate into the transportation planning process. These scenarios can help to either develop policy for implementing future projects that are future resilient or develop model ranges that help to convey the message that certain scenarios could affect expectations should they be implemented.



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NCHRP NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Topic: **Regional Freight Issues**
Categories: **Internal Operations, External Influences, Policy Issues, Partnering & Coordination**

Addressing Regional Freight Issues in the Metropolitan Planning Organization Planning Process

THE CHALLENGE

As freight is a critical component of the transportation system, metropolitan planning organizations (MPOs) must address a range of freight-related matters in the MPO planning process. Some key challenges include the following.

Need for increased consideration of movement of goods in the Metropolitan Transportation Plan (MTP) planning processes. When freight is considered in a separate section or chapter and not fully integrated throughout the MTP, the resulting implementation and transportation system performance can underrepresent the role of freight in the transportation system.

Identifying and balancing freight-related project prioritization metrics. MTPs and other MPO plans must adequately quantify freight project performance. Such projects may benefit some modes that are confined to roadways (e.g., personal vehicles and fixed-route bus transit) but can harm other modes of travel or exacerbate impacts (e.g., noise, air quality, and bicycle and pedestrian safety).

Accommodating increasing freight volumes and associated needs, such as truck parking and curbside management. With the increasing freight volumes (amplified by rapid growth of e-commerce during the COVID-19 pandemic), demand for truck parking facilities, and speed and volume of deliveries to homes and businesses have accelerated. Lack of truck parking is associated with unauthorized truck parking, which causes safety issues for commercial vehicle drivers and others on the roadway. These trends have direct implications for curb space availability, freight vehicle emissions, and freight-intensive land use (including growing demand on the urban periphery and conflicts with other development patterns).

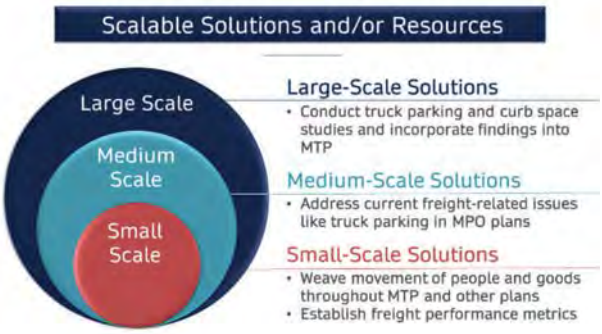
WHY IS IT IMPORTANT?

The efficient movement of goods is vital to the health of people and the economy.

POTENTIAL SOLUTIONS

Some ways for MPOs to address freight more thoroughly and meaningfully include weaving freight considerations throughout the MTP document, incorporating freight metrics into project prioritization processes and addressing truck parking in MPO planning documents, including the MTP.

Addressing regional freight issues can be categorized primarily within external influences associated with changing freight and goods movement patterns. Freight planning relates to internal operations, and policies and partnerships can help address freight-related challenges.



Solution 1: Weave Movement of People and Goods Throughout the MTP. Instead of consolidating freight considerations into a single section of the MTP, MPOs should address both movement of people and movement of goods throughout the plan. This approach ensures goods movement is adequately incorporated rather than addressed without consideration of other users, modes, and resources.

Solution 2: Incorporate Freight Performance Measures and Metrics into Plans. When evaluating projects, MPOs can incorporate project prioritization metrics that measure impacts on the movement of goods. Plan performance measures should also include measures specific to freight and goods movement.

Solution 3: Address Truck Parking in MPO Planning Documents. MTPs, regional freight plans, and similar planning documents should address emerging freight issues, such as the shortage of truck parking availability. Some MPOs have developed freight plans that address truck parking using a truck parking inventory and general types of truck parking solutions even if specific locations are not identified. Examples of innovative truck parking solutions include truck staging and commercial vehicle loading zones; truck parking information and management systems; smart parking systems; and locating truck parking in interchange areas, along transit routes, or in other underutilized spaces. Other relevant topics may include curb management, emissions, and freight-intensive land use.

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WHERE IT HAS BEEN DONE

Rather than addressing all freight considerations in a separate plan, the **Harrisonburg Rockingham Metropolitan Planning Organization's** *2040 Long Range Transportation Plan* (LRTP) weaves the movement of people and goods throughout the entire plan document. Freight is addressed in the plan's existing conditions inventory (including freight corridors and generators), needs, LRTP goals, LRTP performance measures (e.g., intermodal access and efficiency/tons of goods impacted), and improvement strategies. This balanced approach ensures that the movement of people and goods are considered in combination instead of by themselves.

The **Colorado Department of Transportation's** *Colorado Freight Plan* established key strategies, freight-specific performance measures, and investment actions aligned with each of the plan's goals. The freight plan performance measures are in addition to the required federal performance measures. Examples include commercial vehicle involved incident rate per 1 million truck vehicle miles traveled (VMT), available truck parking space per 100,000 VMT, percent of bridge crossings over interstates, U.S. routes and state highways with a vertical clearance less than the minimum design requirement, peak period incident clearance times on key corridors, annual cost of congestion to commercial motor vehicles, and emissions (pounds of carbon dioxide) due to excess truck delay. Freight-specific performance measures can also be incorporated into MTPs.

Big cities have a lot of freight movements. **New York City** has created a very accessible but still comprehensive guide to working with local companies to promote off-hour deliveries. Topics include noise mitigation and how-to guides for transporters and receivers.

The **Georgia Department of Transportation (GDOT)** completed a Statewide Truck Parking Research Project that included a national review of best practices for truck parking; an inventory of public, private, and unauthorized truck parking locations (in the state and within a 30-mile buffer outside the state); as well as potential solutions for consideration.

Curb space analysis and management are highly relevant to regional freight issues. The **University of Washington's Urban Freight Lab** (UFL) conducted the Final 50 Feet research program to understand and quantify current use and operational capacity of curb space for commercial vehicle parking in downtown Seattle. The UFL will also pilot active curb management using sensors and a data platform to provide real-time data.

HIGH-LEVEL STEPS

1. Weave movement of people and goods throughout the MTP, rather than evaluating separately
2. Identify freight-specific performance measures and project prioritization metrics in planning documents
3. Address freight-related issues, such as truck parking, curb management, freight vehicle emissions, and freight-intensive land use in MTPs and freight plans

HIGH-LEVEL DETAILS OF APPROACH

MPO plans and MTPs should address both the movement of people and the movement of goods to ensure a balanced approach. Next, incorporate regional freight issues in the MPO transportation planning processes to identify and incorporate freight-related performance measures into MPO plans. Lastly, freight plans should address pressing freight issues like truck parking, curb management, freight vehicle emissions, and freight-intensive land use.

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NCHRP NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Topic: **Staff Retention**
Category: **Internal Operations, External Influences**

How to Retain Staff at Metropolitan Planning Organizations

THE CHALLENGE

On average across all industries, 28% to 38% of all new employees quit within the first 90 days (Doreen Lang, 2018). With decreases in family size and shrinkage in the labor pool, the ability to find and attract new employees is costing metropolitan planning organizations (MPOs) more every year. A new generation of employees has entered the workforce with unique expectations about work, with less than 15% of these employees being engaged at work and more than 70% looking to leave their current position. As MPOs compete not only with other government agencies but also with the private sector, it is time for MPOs to start finding more unique ways to attract, train, and retain employees.

WHY IS IT IMPORTANT?

The cost to an MPO to find, hire, and train a new employee who leaves making more than $55,000 a year is approximately $82,500.

POTENTIAL SOLUTIONS

The Federal Highway Administration has conducted several research studies to document MPO staffing and organization structures. In 2017, it conducted the *MPO Staffing and Organizational Structures* report. The report found that smaller MPOs have greater difficulty retaining employees, with staff turnover around 18% per year versus 8% to 11% per year for mid-size and large MPOs. When surveyed about if the MPOs offered competitive pay, a third responded that MPOs did not offer it. The remaining two-thirds responded that they are competitive with other government agencies but tend to lag behind private companies in pay and benefits offered. MPOs face special challenges: small MPOs have small talent pools to draw from, nontourist-destination MPOs may have trouble attracting qualified talent, large-market MPOs face competition from better-paying employers, and government organizational structures might offer little opportunity for upward mobility.

With these issues in mind, strategies for retaining staff at MPOs can include increased training and work opportunities, providing work/life harmony improvements and monetary incentives. Staff retention is primarily related to internal operations and external influences and can be addressed through the following strategies.

Solution 1: Workplace & Training Opportunities. Ensuring that team members are empowered at work can help them feel like a valued part of the team. This can include assigning meaningful

projects and explaining why they are important, encouraging training opportunities or conferences, and providing ongoing feedback. When employees go above and beyond, it is helpful to recognize them in front of the board. Additionally, including staff members' names in completed documents and celebrating the victories as a team can help employees feel recognized.

Solution 2: Work/Life Harmony. With a new generation of employees entering the workforce, changes are expected of their employers. To accommodate these expectations, MPOs can consider adopting flexible work hours, enabling telework, sponsoring parental leave, or providing flexibility for those caring for elderly or sick family members. Another strategy is to see what other companies in the area offer to get an understanding of what an agency is competing against for attracting talent.

Solution 3: Monetary Incentives. When employees go above and beyond, performance bonuses can be offered to commend them. Additionally, raises and title changes are beneficial, as merited. Should a staff member leave and another be asked to fill their role, the staff taking on additional responsibility should be compensated for the additional workload or promoted if warranted. Full or partial reimbursement for membership in professional organizations should also be considered.

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WHERE IT HAS BEEN DONE

The **Capital Area Metropolitan Planning Organization** (CAMPO, Austin, TX) has created a program to help employee recruitment and retention. The program includes several areas: onboarding involves describing the ideal candidate, introducing finalists to the office staff, and explaining growth opportunities; work involves talking to employees about meaningful things not related to work, assigning meaningful tasks, encouraging training, and providing performance bonuses; work/life balance includes adopting flexible office hours, allowing telework, and providing tools for a supportive work culture; and leadership involves giving employees a chance to lead, giving credit where it's due, and celebrating victories. CAMPO has used Metropolitan Planning (PL) 104/112 funds to provide performance bonuses when warranted. Additionally, the MPO issues invoices to cities based on population size to obtain matching money for federal surface transportation block grant (STBG) funds for staff performance bonuses.

The **Metropolitan Planning Council (MPC)** in Chicago promotes an Employer Assisted Housing (EAH) system that extends housing affordability for employees while enhancing the competitiveness of businesses. Through the EAH, companies in the Chicago area provide guidance and financial assistance to employees who purchase or rent homes in or near communities where they work. The MPC EAH guidebook provides information on all the steps of the process and includes examples of how the system pays off for companies. For example, a $5,000 forgivable loan for a housing down payment that is forgiven after 5 years of employment will only cost the business $1,000 a year but save them far more in training a replacement.

Ms. Doreen Lang is a consultant on employee retention and author of ***How to Drive Employee Retention in the First 90 Days***. From her observations, the onboarding process should last up to a year, with the first week being the most memorable. Having a staff member with a positive attitude be their initial mentor through this critical period will help them learn the system and feel comfortable. One MPO strength as an employer is the opportunity to engage in a variety of work, from public engagement to technical analyses to graphic/report design. Carving out discrete work tasks that comfortably stretch the employees' abilities keeps them learning and engaged in their work. As time goes on, less instruction will be necessary, but within the first year, communicating thorough instructions and expectations is essential.

HIGH-LEVEL STEPS

1. Research what other competing public and private sector firms offer both financially and for work/life balance
2. Implement formalized telework or flexible schedule determined by employees
3. Establish a conference/training program budget
4. Identify potential funding sources for performance bonus or incentives
5. Conduct check-ins with staff to understand how they are doing and conduct exit interviews

HIGH-LEVEL DETAILS OF APPROACH

With the increase in employee turnover and costs to find and train their replacements, there is more pressure on MPOs today to adapt their organizations to attract and retain employees. The solutions range from simply keeping employees more engaged at work through diversified tasks to providing monetary compensation for performance.

With the information provided here, MPOs can begin the process to evaluate competing public and private sector employers in their region to understand what others are doing and which of those benefits they can also provide.

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NCHRP NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Topic: **Shared Mobility**
Categories: **External Influences, Policy Issues, Partnering & Coordination**

Facilitating Shared Mobility in Metropolitan Planning Organization Planning

THE CHALLENGE

Shared mobility in the current context includes micromobility, mobility on demand (MOD), and mobility as a service (MaaS). Micromobility refers to bicycle sharing, scooter sharing, and other low-speed modes that enhance the first- and last-mile experience. MaaS is defined as a framework for the integration of mobility services into a single platform where people can plan and pay for trips across multiple modes. MOD refers to the ability of consumers to access personal transportation and goods delivery as needed (or "on demand"). The travel modes that encompass shared mobility are bikesharing, scooter sharing, carsharing, ridesharing, ride hailing and more. Current challenges associated with shared mobility are related to the regulation and use of public rights-of-way, consistent data sharing across public and private agencies, and the integration of shared modes into transportation planning to accommodate new travel behavior and infrastructure needs.

Benefits of shared mobility include reduced automobile use and air pollution, as well as increasing individual freedom by increasing the distance people can travel without owning a vehicle. This toolkit topic presents how metropolitan planning organizations (MPOs) are anticipating expected impacts of shared mobility to achieve long-term goals of mobility, sustainability, and equity in the transportation planning process.

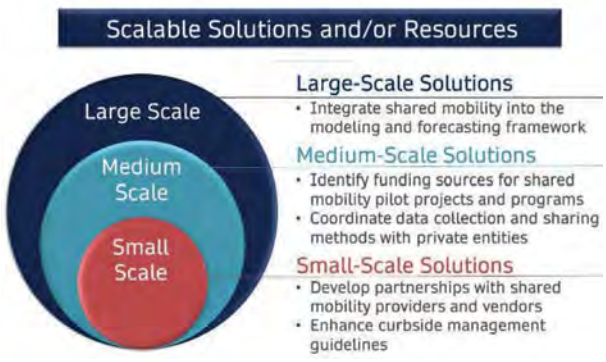
WHY IS IT IMPORTANT?

Shared mobility offers greater mobility and freedom without the need of a personal vehicle, as well as personal cost savings for transportation.

POTENTIAL SOLUTIONS

Shared mobility is related to external influences, policies, and partnering and coordination. MPOs can begin to shape the future of the transportation system with shared mobility by engaging and coordinating with private industry leaders and public agency officials. Overall, transportation as a commodity is expected to impact travel behavior and mode share throughout the nation. MPOs should begin to reexamine the role of infrastructure, land use, and transportation modes as shared mobility continues to grow.

Solution 1: Curbside Management Guidelines and Implementation. MPOs can create policies and guidelines to assist with increased demand for curbside space among shared mobility, parking, and delivery services. The examples of policies and guidelines could include identifying proper locations for shared vehicles and devices to be parked, developing a process for requesting access to the use of public rights-of-way among providers, and establishing appropriate signage and markings for parking areas. This will provide MPOs with tools to manage demand and prioritize shared modes into valuable curbside activity.



Solution 2: Coordinate Data Collection and Sharing Methods with Private Entities. MPOs can develop contractual agreements with private entities representing modes that use shared mobility. This would provide MPOs with a new and informed knowledge that may be relevant for future investment in shared mobility programs, projects, and partnerships.

Solution 3: Integrate Shared Mobility into Travel Demand Forecasting Models. MPOs can deploy household travel surveys that capture individuals using shared mobility services, as shared mobility services and technology are expected to drastically change travel behavior over time. Incorporating these modes into travel surveys and models will provide MPOs with accurate performance predictions of the system and ideas for future infrastructure investment.

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WHERE IT HAS BEEN DONE

In 2016, the **City of Seattle** adopted flex zones that prioritize passenger loading zones for ridesharing services and transit rather than metered parking for single occupancy vehicles. The flex zones prioritize the uses of right-of-way for activities such as passenger loading, parking for bicycles and e-scooters, and walking along commercial and mixed use areas. Overall, Seattle developed a guide that outlines curb use priorities based on the corresponding street types and areas (i.e., commercial, mixed used, residential, industrial, etc.). Also, Seattle has developed policies for curbside management to guide where dockless bicycles and e-scooters should be parked. The policies prohibit bicycles from being parked on or near street corners, curb ramps, bus stops, parking meters, and more to prevent further obstruction hazards for pedestrians.

Metro Transit in St. Louis, Missouri, developed a public-private partnership with Lyft to make transit stops and stations more accessible for its users. The pilot program allows eligible recipients to access $1 trips via Lyft to designated areas throughout St. Louis County. Metro Transit covers up to $12 of the trip, while the customer is responsible for $1. If the trip exceeds $12, the eligible recipient is responsible for the remaining balance as well. The partnership between Metro Transit and Lyft improves first- and last-mile connectivity due to transit service reductions during the COVID-19 pandemic.

The **Puget Sound Regional Commission (PSRC)** recalibrated its most recent travel demand forecasting model to better understand the effects of shared mobility on mode choice and vehicle miles traveled. This recalibration of the forecasting model included shared modes such as transportation network companies (TNCs), TNC pools, and microtransit. This allowed planners and policy makers in the area to understand what the introduction of shared mobility will do to the transportation network in the future. PSRC has also begun to discuss the incorporation of shared mobility into the household travel survey for the future.

HIGH-LEVEL DETAILS OF APPROACH

MPOs can begin to address regional shared mobility in several ways. The first step is to create a collaborative network that includes public agencies, local officials, private vendors, and nonprofit organizations. This network can begin to establish goals, explore the benefits, and recommend strategies to improve shared mobility modes such as microtransit, TNCs, bikesharing, and scooter sharing in the area.

MPOs can further prepare for shared mobility in the transportation system by identifying potential funding sources to launch pilot programs, projects, and partnerships with private vendors. Examples of funding sources that can be used to expand shared mobility, MOD, MaaS, and micromobility include the Federal Highway Administration's Congestion Mitigation and Air Quality Improvement Program as well as the Federal Transit Administration's Mobility on Demand Sandbox Program. MPOs can use these financial resources to promote and expand the benefits of shared mobility modes.

HIGH-LEVEL STEPS

1. Develop curbside management plan and/or policies within urban areas
2. Identify funding sources for future pilot programs
3. Establish data procurement and sharing processes with private entities
4. Incorporate shared use modes into travel demand model to forecast future scenarios

WHERE TO FIND MORE INFORMATION

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SECTION 2

Conduct of Research

CHAPTER 4

Phase I Research Findings

This chapter presents the key takeaways from Phase I of this research, including facilitated conference meetings in late 2019 at three conferences, insights from MPO surveys, and a literature review. The chapter begins with a summary of the survey results and then presents a synthesis of the Phase I research findings of the challenges facing MPOs currently and in years to come.

MPO Survey

An important part of the Phase I research was a nationwide survey of MPOs conducted from February 2020 to May 2020. Completed surveys were received from 129 MPOs from around the country, about half of which were completed before the COVID-19 pandemic and lockdown period initiated in March 2020, and half were received afterward. This dichotomy afforded the research team an opportunity to observe how responses changed from pre- to post-lockdown periods. Figure 4-1 summarizes the key survey responses, with post-pandemic responses in italicized text and all responses in regular text format. Appendix E presents a summary of the National MPO Survey and the survey instrument.

Challenges Facing MPOs

These research findings are organized around four principal themes identified during the research project.

- *Access to Resources*, referring to information accessibility, management, and data sharing;
- *MPO Product Relevancy*, describing how the products and processes have or are evolving to adapt to change;
- *External Partnerships*, how the MPO relates to partnering agencies that have their own missions (e.g., state DOTs, transit providers) as well as segments of the public; and
- *External Change Forces*, addressing forces largely or entirely beyond the control of most MPOs.

Rooted in historic regulatory policy or organizational constraints, the issues discussed in these findings are not always novel. Long-standing issues include recurring challenges with insufficient resources, staffing, or political support to build the regional planning program envisioned. There continues to be room for improving coordination with state and federal partners, meeting performance reporting requirements, and attracting and retaining staff. Continued uncertainty exists about where to find practice-ready resources, best practices, peer exchange programs, and other resources. In short, a lack of resource awareness exists despite many efforts to develop and promote new tools for MPOs.

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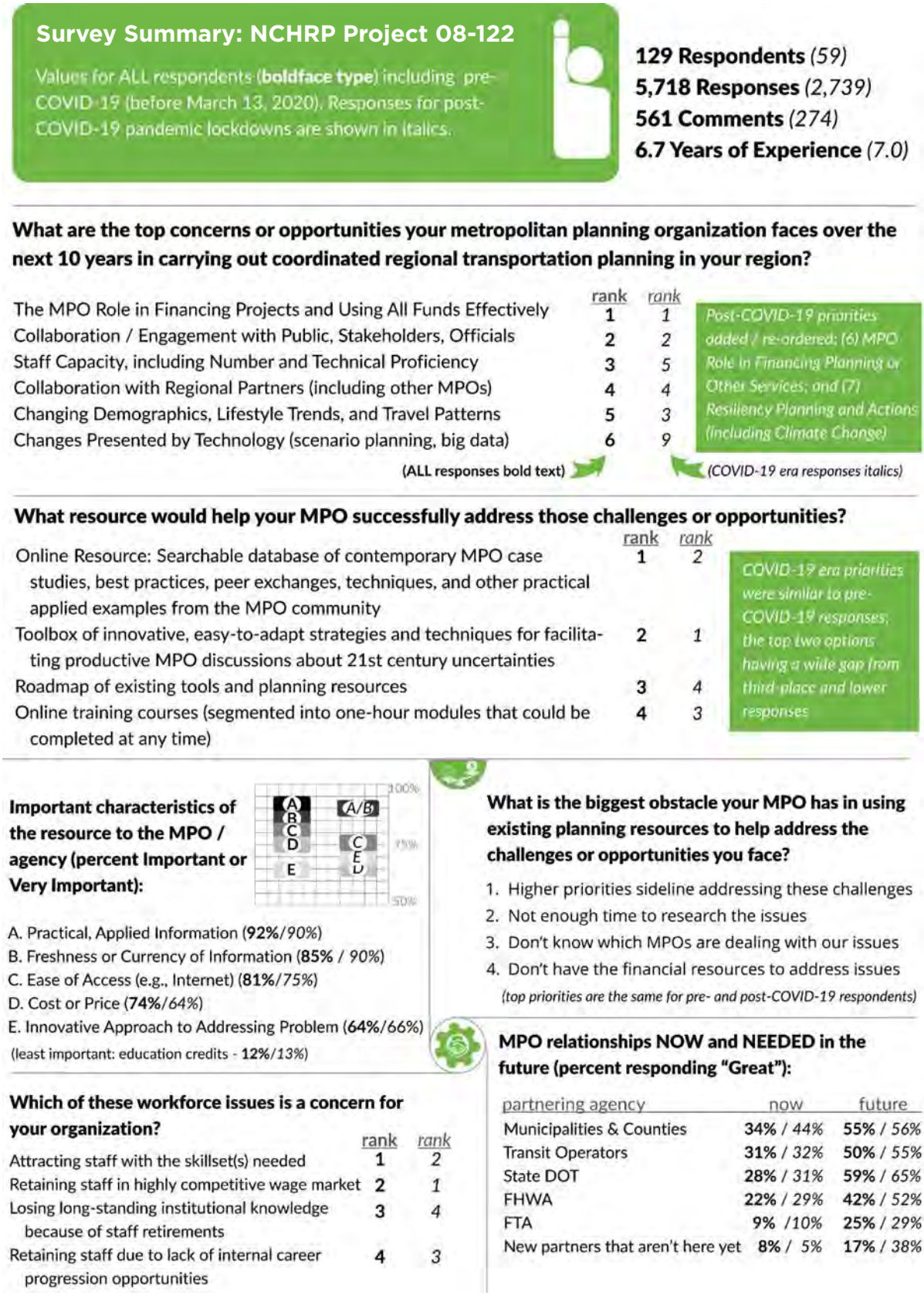

Figure 4-1. Summary of major survey results.

Resources and Access

The deployment of new technologies is outpacing peer-reviewed academic and research papers on this topic. By the time research statements are selected for funding, research contracts let and completed, papers reviewed, and results published and disseminated, several years have passed and the state of technology has already advanced. If MPOs rely solely on published research to understand and respond to the major technological changes underway agencies will always be behind the curve. The majority of forward-looking research discovered was also not practice-ready or was based on work still evolving. The majority of practice-ready applications came from a scan of conference proceedings and peer exchanges.

The research team understood that MPOs need resources to help them with their planning needs: performance measures and reporting, planning for mobility and demographic change, accommodating active transportation, and developing models and analysis tools that are responsive to these changes. Yet our search of resources revealed a number of comprehensive resources developed in the last few years. These have been promoted by FHWA, FTA, TRB, AMPO, NARC, and others, raising questions as to why MPO staff seem to be largely unaware of their existence or simply choose not to use them.

One participant in an interactive conference noted, "We do not need to reinvent the wheel; if you create a new resource it has to beat an online Google search." Comments like this one suggest (a) that the resource tools available to MPOs now present challenges in terms of their accessibility that make them less-than-desirable tools for frequent use, and (b) that the products from this research would ideally be easy to access and navigate.

> We don't need you to reinvent the wheel; if you create a new resource it needs to beat an online Google search.
>
> *Association of MPOs 2019 Conference Participant*

MPOs have generally embraced the national transportation performance measures required by successive federal transportation legislation with a survey of MPOs in 2017 noting that 94% were transitioning or had transitioned to performance-based planning methods (Kramer et al. 2017). Many regions include more holistic community values in their long-range transportation plans (LRTPs), often referred to as Metropolitan Transportation Plans or sometimes regional transportation plans, all of which in this context refer to a fiscally constrained plan of projects with at least a 20-year time horizon. Many of these values resist easy-to-quantify metrics on which a traditional performance-based planning framework is based. Sustainability, resiliency, reliability, and equity are some of the multi-sector concepts more commonly found in long-range plans today than 10 years ago. Ways in which these comprehensive objectives are addressed vary by region and reflect local concerns. The actual role of MPOs in these areas is still emerging, as is their potential contribution to these structural societal concerns given the amount of effort devoted to federally mandated activities.

Relevancy of MPOs and Products

MPOs have voiced concerns that some of their efforts are not considered sufficiently relevant by state and local partners with respect to infrastructure and funding decisions. MPOs are obliged to engage in integrated transportation and land-use planning despite often having little or no authority over land-use decisions.

Freestanding (independently hosted) MPOs or MPOs integrated with a host city or regional agency may influence both resource levels and the ability to effect change (Bond and Kramer 2011). MPOs develop fiscally constrained long-range plans generally without authority to raise revenues and directly control only a small share of funds spent on transportation infrastructure and services. They develop long-range strategies while cities, counties, transit agencies, and

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state DOTs make day-to-day decisions that might conflict with the letter or the intent of those strategies.

The past has never been a flawless predictor of the future and that is even truer as the 21st century unfolds. Rigid plans for a 20-year horizon can easily overlook the unprecedented technological, societal, environmental, and economic change disrupting almost every aspect of the transportation system at an ever-faster pace. Yet development and maintenance of 20-year plans are significant budgetary elements of every MPO work program. Resources directed to forecasting and updating plans are resources that are then unavailable to develop more adaptive, responsive processes and plans that incorporate multimodal and technology-enabled solutions to transportation concerns. Williams and Seggerman (2014) discuss best practices for multimodal transportation in Florida that can increase accessibility for many underserved groups. Their report provides guidance on establishing community vision and priorities, analyzing current and future conditions, establishing quality and level of service standards, and future transportation network planning strategies.

Challenges persist in integrating topics of interest presented by MPO boards, such as health-based effects or social equity in decision-making. Lyons et al. (2012) have proposed a framework by which MPOs can integrate health into their planning process. They recommend a holistic approach to health, including consideration of active transportation, air pollution goals, and access to opportunities for healthy lifestyles in transportation plans with four MPOs used as case studies. The study found that MPOs typically must develop unique approaches to health, despite health challenges being generally similar across regions. Regional context was identified as an important factor in decision-making, which is likely true for other affiliated objectives as well. It is worthwhile to review the "Social Equity" topic sheet in the Toolkit for the 21st Century to see how the San Francisco Bay Area has worked social equity considerations into its planning framework.

MPOs face a wide range of modern mobility challenges associated with technological advances for which they may have little or no relevant experience. Considerations include developing autonomous-ready policies; coordinating with new mobility partners; accounting for the effects of connected and highly autonomous vehicles on traffic operations in a model or future household travel behavior survey; accessing and incorporating big data resources into regional data programs; and other complex matters. It is worthwhile to note that the U.S. DOT has not formally endorsed the use of such data at the time of this writing and that while improving, it still relies on sampling. As such, there is a range of error that needs to be appreciated, especially where such approaches assess low-volume streets, transit ridership, truck volumes, or bicycle-pedestrian activity. These regionally significant topics have policy and investment implications for MPOs and their partners.

External Partnerships

Public participation remains a vital centerpiece of the MPO planning process, but the rules of engagement have changed over the last decade and will continue to change. Online engagement platforms greatly expand opportunities for public collaboration and input, as has the growth in communication tools and the use of social media. These advances bring new risks, too, especially in volatile times. Creating safe environments for engagement is different in a cyber-environment than in person, and access to online opportunities is not universally shared. Public expectations about engagement and how to communicate with different segments of the public are changing. MPOs must keep up with the times, accommodating changing social norms for communication and engagement while ensuring technology is not a barrier to participation.

Some MPOs indicated that regulatory constraint keeps them from adapting and responding to regional priorities, in part because of limited resources to address nonregulated issues. Still,

other MPOs use this same regulatory framework as a platform from which to tailor a regional planning program that is responsive to their community's needs. Similarly, the research team was repeatedly told that the interpretation of federal requirements pertaining to MPOs varies between states.

During the outreach phase, MPOs discussed relationships with transit operators and neighboring MPOs, which were generally positive. New partnerships were deemed important to develop, particularly for private sector operators in the Mobility as a Service (MaaS) and micromobility spaces. The required responsibilities of MPOs and restrictions on how funding can be spent may be hampering the level of engagement with these partners.

External Change Forces

External changes include technological innovation in the economic and information sectors; artificial intelligence disruptions to the global manufacturing and logistics sectors; climate change impacts and resulting effects on everything from trade routes to food and water scarcities that drive population migrations and associated demographic and cultural shifts; fluctuating energy prices and policies; and more recently, a global pandemic and a resurgence of social equity concerns. Research conducted in 2019 (Kuzio 2019) noted that, based on a qualitative content analysis of regional transportation plans, 80% of the plans in the sample incorporate social equity considerations beyond the current environmental justice requirements; 70% mentioned emerging technologies, but only 20% considered the equity implications of those technologies.

These are some of the external forces exerting considerable pressure on transportation infrastructure and demand for travel that MPOs must plan for in the future, but it is not clear how readily many MPOs can adapt with leadership from individual member agencies. As one NCHRP panel member noted on a very different issue, it may be that MPO member agencies and political appointees are reluctant to take on greenhouse gas and climate change matters, not MPO staff.

Cities, transit agencies, and state DOTs are now working to integrate emerging technologies and mobility services into the transportation system, but the perceived need for integrating these practices into mainstream planning practice is lagging. The research team found few examples of active MPO participation in the development of automation-ready policies or the consideration of equity implications or impacts on transit and working with nontraditional or private partners. The Mid-America Regional Council (Kansas City) (Vandervalk et al. 2017b) and Hillsborough MPO (Tampa) (Vandervalk et al. 2017a) have piloted U.S. DOT's guide for creating a Roadway Transportation Data Business Plan that is designed for managing and using mobility-related data in transportation planning. It can also help MPOs to better understand how mobility-related data can be used to support various regional initiatives, including the implementation of autonomous vehicle technology. However, many MPOs are likely observing, not participating or leading, the significant coordination that will shape mobility for the rest of this century.

Key findings and potential pandemic influences are displayed in Figure 4-2.

These findings were significantly informed by input from the Regional Roundtables and Information Forums conducted from February to April of 2021. The approach taken for these sessions and the key findings from them are summarized in the next chapter.

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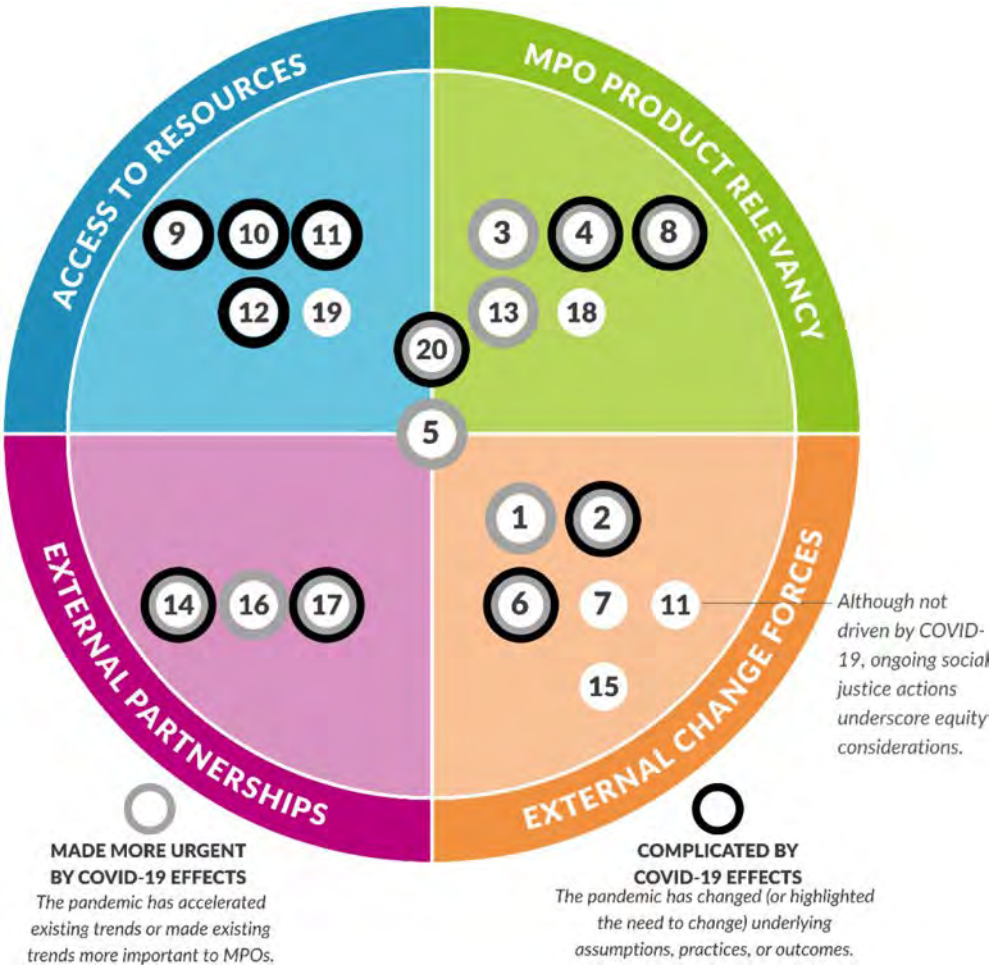

Note: The numbers in Figure 4-2 are defined in the numbered list below.

1. Twenty-first-century technologies present MPOs with complex new mobility challenges.
2. Major forces external to transportation are driving transportation change.
3. Traditional long-range plans have diminishing shelf life and relevancy.
4. MPOs risk diminished relevance as 21st-century mobility evolves.
5. Whether 23 CFR (Code of Federal Regulations) §450 (Planning Assistance and Standards) Subpart C (Metropolitan Transportation Planning and Programming) is a regulatory ceiling or a regulatory floor is a matter of debate.
6. Rapid advances in communication tools, engagement platforms, and social media standards challenge MPO technical capacities.
7. Broader community values increasingly augment traditional LRTP/MTP (metropolitan transportation plan) performance measures.
8. Chronic MPO issues from the last 30 years persist in 2020.
9. Published research on transportation technology becomes quickly outdated.
10. Many MPOs do not use the resources available to them now.
11. Concepts like resilience and equity are still in their MPO planning infancy.
12. Planners look to each other, often at conferences, for real-time insights and experience.
13. The long-range horizon of planning uncertainty is 5 years and getting shorter.
14. Collaboration and coordination across government sectors are more important than ever.
15. The understanding of "region" needs to be revised and updated.
16. Better coordination and guidance between MPOs, state DOTs, and U.S. DOT are needed.
17. Relationships with nontraditional partners are evolving rapidly and are more important.
18. Having the right goals is increasingly important, as is evaluating them more often.
19. Staffing issues, including continuity and training, are important.
20. Roles are changing in funding or financing of projects and services.

Figure 4-2. Individual findings and the potential effects of the global pandemic.

CHAPTER 5

Regional Roundtables: Approach and Key Findings

Purpose of Regional Roundtables

This chapter discusses the Regional Roundtables that were conducted in Phase II of this research. The Regional Roundtables identified challenges and opportunities that MPOs and their agency partners have experienced during the implementation of the 3C process. They also identified noteworthy best practices that are being utilized by other MPOs and between state and federal agency partners. Likewise, the Regional Roundtable attendees discussed major MPO policy issues that are facing MPOs and their agency partners and how those issues could be better addressed through the 3C planning process (see Appendix B).

The purpose of the Regional Roundtables was to identify the challenges and opportunities MPOs and their agency partners experience in implementing the 3C planning process and to identify best practices that could be replicated (or not). It was also the purpose of the study to identify major policy issues facing MPOs and their agency partners and how to collectively address those issues in recognition of the following shifts to each of the three Cs:

- ***Continuing***—Many MPOs have a long institutional life, although new MPOs emerge and existing boundaries may change as a result of population changes.
- ***Cooperative***—MPOs need to navigate changing relationships with adjacent MPOs, state DOTs, and existing or new provider partnerships.
- ***Comprehensive***—This now encapsulates rapidly evolving technologies, demographic/cultural trends, and potentially expanded or altered roles such as economic development or project funding.

The key findings presented represent the comments and suggestions of the individual roundtable attendees. The Regional Roundtables did not attempt to create consensus findings or test the comments against other sources. The attendees identified strategies for adapting to changing needs and conditions that are being explored by MPOs throughout the nation. Examples include the addition of health and wellness planning, funding or financing of projects, and Emergency and Homeland Security Planning into the 3C planning process.

Approach to Regional Roundtables

Eight Regional Roundtable events were conducted with participants throughout the United States, including MPOs and traditional mobility partners (typically transit, U.S. DOT, and state DOT representatives). AMPO and NARC provided suggestions and guidance in the selection of the MPO attendees for the Regional Roundtable discussions. Both organizations are experienced and knowledgeable about the activities of the nation's MPOs and their staff. MPOs of varying sizes and geographic locations were selected to participate in the roundtable discussions.

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The MPO directors selected to participate in the study provided valuable assistance in identifying individuals from their agency partners who had the knowledge and experience to effectively participate in the study. Likewise, members of the NCHRP panel contributed by offering advice and recommendations regarding the selection of MPOs and their agency partners who participated in the study.

The FTA regions were used to ensure the roundtable discussions were held for diverse areas throughout the country but otherwise had no bearing on the content or order of the Regional Roundtables. Six of the Regional Roundtables were conducted with MPOs and their agency partners from the states of Connecticut, New York, Florida, Arizona, Washington, and Texas. These six single-state roundtable discussions included representatives from at least two MPOs, the state DOT, the FHWA Division Office, the FTA Region Office, and a transit operator.

Two of the Regional Roundtables were multi-state, megaregion discussions by two or more MPOs that included only MPO representatives. One Regional Roundtable included MPOs from the states of Idaho, Montana, and Wyoming while the other included MPOs from Maryland, Virginia, and the Washington, DC, metro area.

Each Roundtable posed consistent questions that were answered before, during, or after the virtual roundtable discussion. Different research team members led the roundtables with a logical preference for geographic location or familiarity when possible.

The MPOs that attended the Regional Roundtable discussions represent the organizations shown in Table 5-1.

Due to the COVID-19 pandemic health measures, all Regional Roundtables were virtual meetings. The attendees were informed during the roundtable discussion that the virtual meetings would be recorded and used to develop summary reports. The attendees were also informed they may expect requests for clarification or additional information resulting from the meeting

Table 5-1. Organizations participating in a Regional Roundtable discussion (RRD).

Metro Washington, DC Megaregion (DC–MD–VA RRD)
Metropolitan Washington [DC] Council of Governments
Hampton Roads [VA] Transportation Planning Organization (TPO)
Baltimore [MD] Metropolitan Council
Idaho, Montana, and Wyoming Megaregion (ID–MT–WY RRD)
Bannock, ID TPO
Missoula, MT MPO
Cheyenne, WY MPO
Connecticut (CT RRD)
Capitol Region Council of Governments
Lower Connecticut River Valley Council of Governments
New York (NY RRD)
Capital District Transportation Committee
Greater Buffalo-Niagara Regional Transportation Council
Florida (FL RRD)
Forward Pinellas
MetroPlan Orlando
Washington State (WA RRD)
Puget Sound Regional Council
Walla Walla Valley MPO
Arizona (AZ RRD)
Maricopa Association of Governments
MetroPlan-Greater Flagstaff
Texas (TX RRD)
Dallas-Fort Worth MPO
Waco MPO

discussions. Each roundtable invitee was polled to determine their availability to participate in a Regional Roundtable. Roundtables were then scheduled based on meeting dates and times (approximately 90 to 120 minutes, depending on the number of attendees).

In advance of each scheduled roundtable discussion, the invitees received a meeting agenda and a list of questions that pertained to the 3C planning process. The four questions presented for consideration during the Regional Roundtable discussion were:

- How can MPOs and their agency partners be poised and equipped to better address current and future opportunities and challenges (i.e., pandemics, market disruptions, or other unexpected events)?
- What strategies can be used to improve the efficacy of MPOs and their agency partners in implementing the 3C planning process?
- Should the roles, responsibilities, and resources of MPOs change in relation to their state, regional, and local transportation partners?
- What are some noteworthy best practices in the 3C planning process that could be replicated (or not) by other MPOs?

Additionally, the MPO invitees were also asked to identify and submit major policy topics facing MPOs and their agency partners and enhancements or changes to the 3C planning process that could assist MPOs and their agency partners to better address those topics. One or two of the policy topics were discussed during the roundtable discussions.

Agenda for the Six Single-State Regional Roundtables

The Regional Roundtables were led by senior planning professionals with experience in meeting facilitation and sought to engage all attendees in the discussion. The roundtable discussions followed the agenda below.

- Welcome and Introductions
  - Attendees introduced themselves and provided background about their agency and experience. Background on the NCHRP study was provided, and the study elements were identified as online Information Forums, Regional Roundtable discussions (RRDs), an Innovation Database, and the Toolkit for the 21st Century.
- Part I: Best Practices, Challenges, and Opportunities in the 3C Planning Process
  - A discussion of challenges and opportunities experienced by MPOs and agency partners in the 3C planning process was followed by input on best practices.
- Part II of Regional Roundtable Discussion
  - MPO major policy issues identified from polling questions were followed by a discussion of potential enhancements or changes to the 3C planning to address those issues.
- Next Steps
  - The facilitators reviewed the NCHRP report process and discussed the remaining questions and resource materials.

Appendix B contains the summary of all Regional Roundtable discussions, including the two multi-state roundtables.

Regional Roundtable Discussion Key Findings

The attendees at the RRDs presented their perspectives on a variety of topics related to the 3C planning process, summarized in the following pages. In general, four overriding themes evolved from the discussions: (1) Interagency Coordination, (2) Roles and Responsibilities, (3) Funding and Resource Allocation, and (4) Communication and Technology. Applicable key

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findings derived from these discussions are organized by the four themes with the source of the information noted at the end of each finding.

Interagency Coordination

The 3C planning process relates directly to MPO and agency partner coordination in that effective MPO and agency partnerships are best achieved when they are cooperative, comprehensive, and continuing.

Each RRD addressed the importance of working relationships between MPOs and their agency partners as indicated by the following key findings.

All MPOs in Connecticut are hosted by a Council of Government (COG). This provides MPOs the ability to be actively involved in transportation issues as well as other issues that relate to transportation but are not considered core MPO planning requirements. The COG and their MPOs have established the Connecticut Association of Councils of Governments, which provides MPOs and their agency partners a forum to discuss and advance the 3C planning process. (CT RRD)

All MPOs and the Connecticut DOT are on the same update/adoption schedule for the development of MPO LRTPs, Transportation Improvement Programs (TIPs), Unified Planning Work Programs (UPWPs), and the State Transportation Improvement Program (STIP). (CT RRD)

A mid-term informal MPO certification review takes place with each MPO following their official MPO certification review. This mid-term informal review includes the participation of the MPO, the Connecticut DOT, and the FHWA Division Office. (CT RRD)

In the Washington, DC, Metro region, the events of 9/11 and recognition of cross-jurisdictional security issues caused the creation of a new entity for three state DOTs, transit operators, Homeland Security, and others that are staffed and partially funded by the MPO. (DC–MD–VA RRD)

MPO advisory committees in New York State provide an important organizational level within the MPO structure. Advisory committees for equity, freight, operations, and safety focus on important policy and planning issues that expand the skills and capabilities of MPOs. The Greater Buffalo-Niagara Regional Transportation Council and the Capital District Transportation Committee use advisory committees that work with many nontraditional transportation partners that previously had a less pronounced role in working with MPOs. (NY RRD)

The New York State Association of MPOs (NYSAMPO) provides a forum for discussion between MPOs and their agency partners that could be replicated throughout the nation. It provides for sharing information and a platform to learn the activities of other organizations, including FHWA and FTA. The association has a long history conducting applied research studies that benefit the MPOs and the planning profession. (NY RRD)

MPOs may enhance their partnerships by serving as a database warehouse or providing geographic information system (GIS) services to local government members. The Missoula MPO has developed partnerships with neighborhood associations to create a broad traffic management program focusing on local streets (speeding) and in turn, leveraging that to implement neighborhood greenways/bike boulevards, traffic circles, placemaking traffic calming (such as murals added to public space, open street events)—then tying all of this back to transportation projects and priorities that empower people. (ID–MT–WY RRD)

A shared planning process is being used to promote a common vision and mission between organizations within a Florida MPO area. Forward Pinellas shares a common vision with the Pinellas Suncoast Transit Authority and together they have branded their LRTPs as "Advantage Pinellas." Investment corridors were identified by the county to direct funding decisions for land use, transportation, and housing. (FL RRD)

The Missoula MPO has worked with the local transit provider to create zero-fare transit, in part with Community Multiscale Air Quality Improvement (CMAQ) funds. Ridership nearly doubled in 3 years (70% in 2 years), which led to more grants to get electric vehicles in part based on an increase in ridership. Hence, a $350,000 per year to transit leveraged many millions of dollars in grants, bus stops, and accessibility improvements. They further noted that transit has its own taxing jurisdiction. (ID–MT–WY RRD)

Interstate 4 Corridor Regional Transportation System Management & Operations (TSM&O) program includes five MPOs and multiple Florida DOT districts. Similarly, private rail companies are members of the MPO, and they also partner on projects, as does the military. (FL RRD and DC–MD–VA RRD)

Regional transportation planning and coordination are promoted throughout Florida where multiple MPOs have come together and established separate Regional Transportation Planning Organizations including the Central Florida MPO Alliance and the West Central Florida MPO Chairs Coordinating Committee in the greater Tampa Bay area. (FL RRD)

The Florida MPO Advisory Council (MPOAC) was created by state law and serves as a forum for collective decision-making by Florida's 27 MPOs. The MPOAC brings MPOs, Florida DOT, and federal agencies together every quarter to address state and federal transportation issues that affect MPOs. (FL RRD)

The Cheyenne area Connect 2045 LRTP worked with the city on a future land-use map (which is typical in terms of their coordination) that fed into the land-use component of their travel demand model. They also worked with the city's DOT on the passenger rail of the North Front Range, and now there is discussion of additional planning with the Colorado DOT with the MPO managing the project. (ID–MT–WY RRD)

Washington DOT and MPOs have established quarterly Coordinating Committee meetings that serve as a forum to exchange information and address the many issues and requirements that pertain to transportation planning. (WA RRD)

Development and update of statewide formulas used to allocate federal planning [Public Law (PL) 104] and public transportation (5303) funds included the participation of both the Washington DOT and the MPOs. (WA RRD)

Large-scale corridor studies have been initiated by the Maricopa Association of Governments, including one for the Sun Corridor. This corridor study includes the greater Phoenix area, other associations of governments, and MPO member agencies in the corridor. A joint planning advisory council was formed in 2009 to "foster a successful and economically viable Sun Corridor in the state of Arizona" and to coordinate planning efforts between the Maricopa Association of Governments, the Pima Association of Governments, the Central Arizona Governments, the Central Yavapai MPO, and the Sun Corridor MPO. (AZ RRD)

The Baltimore Metropolitan Council (BMC) noted that some advocacy organizations attempt to work with the MPO to gain an advantage over other entities. MPOs need to stay within their areas of expertise and be observant of potential conflicts. (DC–MD–VA RRD)

The FTA Region IX Administrator in San Francisco moved an FTA planning position to the FHWA Division Office in Phoenix to improve the FTA's ability to effectively participate in Arizona's statewide and MPO transportation planning process. (AZ RRD)

The Association of Texas MPOs (TEMPO) is a statewide organization that meets at least quarterly. All MPOs in Texas representing any area or portion of an area within Texas are eligible for membership in TEMPO. Associate membership is extended to the professional staff of Texas DOT, FHWA, and FTA. The association has adopted bylaws, and among its duties is to provide a conduit for the exchange of information and ideas. (TX RRD)

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The FTA Region VI has entered into a single planning agreement with its FHWA Texas Division counterpart to promote coordinated and consistent transportation planning. FTA has also transferred Section 5303 planning funds to Texas DOT so that those funds can be allocated as part of a consolidated planning grant. (TX RRD)

Roles and Responsibilities

Many of the MPO and agency partner roles and responsibilities were established in ISTEA and through subsequent federal transportation reauthorization legislation. Some states (e.g., Florida) have enacted legislation that further defines MPO and agency responsibilities as they pertain to the 3C planning process. The RRD attendees saw a clear linkage between their defined roles and responsibilities and the requirements of the 3C planning process as indicated by the following key findings.

While resiliency and response to climate change, especially sea-level rise, is not yet at the forefront of many MPOs, the BMC has taken this issue seriously. Looking at flooding impacts as they relate to the environment and impact transportation infrastructure are not separate issues but should be considered together; however, few people have experience in both areas. (DC–MD–VA RRD)

Connecticut MPOs are the host agency for emergency planning and Homeland Security planning and are directly involved in the development of Natural Hazard Mitigation Plans and Homeland Security plans. (CT RRD)

The roles and responsibilities in Connecticut between MPOs and their agency partners are generally working well and are not in need of major changes. (CT RRD)

The Greater Buffalo-Niagara Regional Transportation Council is involved in risk and market share analysis and has contracted a smart mobility advisor to ensure they are contemporary in their thinking and planning practices. (NY RRD)

New York State DOT and the MPOs are working together on Clean Cities Programs and state policy initiatives on climate change and resiliency. There is also a joint funding arrangement on big data and a sharing of expertise between the New York State DOT and the MPOs. (NY RRD)

In general, the New York State area attendees did not feel there was a need for significant changes in the roles and responsibilities of MPOs, states, and federal agencies in the 3C planning process. The role of MPOs has significantly grown over the years as they are now involved in many more issues and at a much deeper level. The 3C planning process provides the MPOs the flexibility they need to engage in a variety of issues that varies from MPO to MPO. (NY RRD)

Project delivery workshops are being used by the New York State DOT, transit agencies, and MPOs to inform project sponsors and MPO members of the status of ongoing projects. New York State DOT has provided training for project sponsors as a condition to receiving project grants. Some MPOs use project selection criteria that include a sponsor's track record in delivering projects on time as a condition to be included in MPO TIPs. (NY RRD)

Florida DOT developed an MPO Program Management Handbook that is used by the department's central office, district offices, and MPOs to implement the various state and federal requirements that apply to MPOs. The department is embarking on the development of a template for MPO UPWPs to streamline the planning process. (FL RRD)

MetroPlan Orlando has expanded the role of nontraditional transportation partners in the MPO 3C planning process to include health planning professionals, utility companies, and the business community. (FL RRD)

Participants in the Florida Regional Roundtable noted that since the early passage of the ISTEA in 1991, there has been little change to the population benchmarks used to establish MPOs and Transportation Management Areas (TMAs). While MPO responsibilities vary between TMA and non-TMA areas, few provisions recognize the "capacity" of an MPO to assume new responsibilities, including some that are currently granted to state DOTs and other transportation entities. (FL RRD)

While the MPOs and Washington DOT have embraced performance-based planning and programming in the development of MPO plans and the selection of transportation projects, both organizations noted the challenges they face in implementing the state's 3C planning process due in part to "legacy projects" and the established role of state legislators in the selection of mobility projects. (WA RRD)

The Ari-Son (Arizona-Sonora) Megaregion Council was created by an agreement signed between the mayors of Sonora, Mexico, and Arizona in 2014 to increase dialogue and strengthen cross-border economic development efforts. The objective is to expand local government connections, share best practices, provide a forum to elevate the voice of local leadership on binational policy matters, and identify areas for opportunity and collaboration. (AZ RRD)

MetroPlan-Greater Flagstaff in Arizona conducts an annual strategic advance (instead of retreat) on the vision, mission, and guiding principles for the MPO and region. It includes developing tactics and measurable objectives the region wants the MPO to achieve. This strategic advance helps the MPO move forward and stay relevant. (AZ RRD)

TSM&O planning activities can be expanded in smaller MPOs by establishing collaborative partnerships with larger MPOs. The Maricopa Association of Governments is partnering with smaller MPOs in Arizona to expand TSM&O planning activities in the MPO 3C planning process. (AZ RRD)

Regardless of their size, MPOs are facing an enormous challenge in being able to meet the federal planning requirements. To meet this challenge, the Texas Regional Roundtable attendees suggested different planning requirements for TMAs, based on population thresholds. The participant recommended MPO divisions be defined as non-TMA MPOs (under 200,000 population); TMAs with a population over 200,000 to 1 million; and TMAs with a population over 1 million. It was also recommended that federal agencies should identify the top 18 or so requirements they expect MPOs to conduct and assign more of those planning responsibilities and funding to MPOs over 1 million in population. Participants also suggested that the population growth rate of a state should also be factored into the federal planning fund distribution formula. It is estimated that Texas is expected to grow from 27 million people today to over 47 million people by the year 2050. (TX RRD)

Funding and Resource Allocation

The planning and implementation of MPO transportation plans and programs are contingent upon adequate funding. Federal legislation addresses the process state DOTs and MPOs must use in project selection and the allocation of federal transportation funds. The following key findings regarding these issues are listed below.

Finding a (sample) scope of work for things that an MPO wants to take on can be challenging; larger MPOs can be helpful in this way. The Missoula MPO stated that there is less control over funding compared to TMAs. Prior to the FAST Act, there was more flexibility in terms of direct suballocations, but now it is very competitive, and there is less local control over the selection and implementation of projects. (ID–MT–WY RRD)

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COGs and MPOs in Connecticut utilize federal transportation funds as well as per capita member fees to address the costs associated with running an MPO and fulfill the many federal and state planning requirements. (CT RRD)

The Metro Washington, DC, COG noted staffing issues. More than 50 people are MPO staff, a number of whom have stayed for 40 years, many of whom maybe average 20 years. However, turnover is about 10% per year for other staff. The multi-jurisdictional aspects, lack of concrete authority, and increasing regulatory burdens without commensurate increases in resources create uncertainty among some staff. No one wants to start a career at an MPO but instead, they fall into it. State DOTs, city DOTs, and transit agencies all share this problem. There is no central or organized place to seek MPO talent. (DC–MD–VA RRD)

Indirect rates that Connecticut MPOs use to allocate FHWA and FTA funds are not always recognized by other federal agencies. Applying state-approved indirect rates may be a more effective approach for MPOs seeking funds from other federal agencies. (CT RRD)

Maryland's State Highway Safety Office provides $300,000 to $400,000 annually to BMC which, among other activities, supports a full-time safety coordinator position. (DC–MD–VA RRD)

New York State DOT purchased and shared with MPOs transportation data through Transearch that is used to develop MPO plans and programs. The purchase and sharing of data by the New York State DOT for MPOs are needed to offset the increasing costs associated with operating an MPO. Having access to free or low-cost data is important to offset the increasing costs of procured data associated to satisfy required products such as performance measures reporting requirements and the development of congestion management processes. (NY RRD)

Bicycle/pedestrian master plans and corridor studies submitted to the Capital District Transportation Committee by villages, towns, and other local governments are eligible for "Linkage Studies" where the MPO may fund up to 75% of the project cost. (NY RRD)

The Capital District Transportation Authority has regional set-aside funds for Bus Rapid Transit that require a local match commitment. This annual local funding match reaffirms the project sponsors' commitment to the region. (NY RRD)

Forward Pinellas has dedicated $100,000 in federal metropolitan planning (PL) funds for local linkages projects that support the connection between land use and transportation. Likewise, MetroPlan Orlando has allocated a portion of its federal urban funds to local government Complete Streets, bicycle, and trail projects. (FL RRD)

Peer-to-peer exchanges and sharing information between large and small MPOs have greatly benefited those MPOs with fewer financial resources. (WA RRD)

A shared position was created by MetroPlan-Greater Flagstaff and the Mountain Line Transit Agency that is jointly funded and located to the transit agency. This has proven to be a cost-effective way to provide staff services for smaller MPOs and transit agencies. (AZ RRD)

Texas DOT is working to assist the MPOs in securing data that is necessary to conduct the requirements of the MPO planning process. It was noted that some data sources restrict the analysis of data to Texas DOT. (TX RRD)

A portion of State Planning & Research (SP&R) funds is set aside by Texas DOT for smaller MPOs who need additional funding to conduct the 3C planning requirements. MPOs must apply to Texas DOT to access those funds. (TX RRD)

Large MPOs in Texas are exploring the use of partnership funding agreements with smaller MPOs to assist them in advancing projects that currently have only partial funding in the Texas DOT Work Program. (Note that two of the largest MPOs in Texas have voluntarily reallocated a portion of their PL104 planning funds to smaller MPOs.) This enables projects to move forward in smaller MPO areas while ensuring that the larger MPOs will be reimbursed in the Texas DOT Work Program during specified future years. (TX RRD)

The Bannock [ID] Transportation Planning Organization (BTPO) noted the importance of this issue, stating that adding a new TMA in the state sharply reduced the amount of funding for other MPOs because of federal requirements for direct allocation to TMAs. This loss will have to be made up now by local funds. (ID–MT–WY RRD)

Communication and Technology

The 3C planning process now encapsulates evolving technologies and communication tools that connect MPOs and their agency partners. These evolving technologies will continue to play an important role in supporting the 3C planning process during customary or usual practices and unexpected events, as noted by the following key findings.

The Cheyenne MPO started their plan update with an economic forecast of 1%, increased later to 1.28% per year, and now that seems too low. People may be leaving California and Colorado to move to Wyoming, and Microsoft has been expanding operations with a new business park on the south side of downtown, and another new high-tech company will be coming soon. These changes are suggesting ways of modifying traffic forecast methods. The BTPO added that young people who can work from home are moving into their area, and the Missoula MPO noted that they have had to develop a telework policy. (ID–MT–WY RRD)

Sharing data assets, websites, and information related to the development of TIPs and the STIP is being advanced in Connecticut to reduce costs and enhance the 3C transportation planning process. (CT RRD)

The planner of the future will be someone who can work with and manage data. Technology skill sets will continue to be important as planning has become more science than art. Planners will need to be able to harness social media data and be able to differentiate reliable data from the unreliable data that is being broadcasted. MPOs will recognize that they need planners with different skill sets—including collaboration, communication, and expertise in land use, sustainability, and data analysis—who complement one another to create an effective and balanced MPO team. (NY RRD)

Continuity of Operations Plans (COOPs) enabled MPOs during the COVID-19 pandemic to have alternate public involvement methods in place during the emergency without having to amend their public involvement plan to use them. (FL RRD)

Communication and consensus building are a hallmark of the 3C planning process used throughout the state of Washington. (WA RRD) For smaller MPOs, going virtual has been more of an issue. The BTPO noted that the smaller the organization, the harder it is to switch/understand the transition to virtual and online methods, making the switch expensive. (ID–MT–WY RRD)

The 20-year (long-range) plan adds value but should include recognition that there is a problem gaining certainty and forecasting transportation conditions 20 years into the future. Presenting a 20-year plan creates a false sense of accuracy for volumes of future travel and funding. (DC–MD–VA RRD)

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Arizona DOT and the MPOs are working to centralize data collection and develop a tool in an electronic or GIS format that shows available data and the data gaps. The department is trying to centralize data on a 5-year plan of projects. (AZ RRD)

The MPOs are working with Texas DOT and the Texas A&M Transportation Institute (TTI) to provide inter-MPO training on specific subjects, such as resiliency planning. (TX RRD)

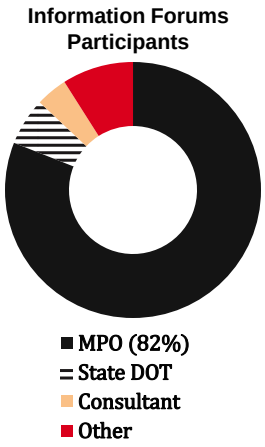
Peer-to-peer exchange programs conducted by FHWA have improved the Texas MPO planning process. For example, MPOs have participated in managed lanes and fiscal constraint peer-to-peer exchange activities. (TX RRD)

CHAPTER 6

Information Forums: Approach and Key Findings

This chapter presents the approach and key findings from the eight Information Forums that were conducted between late February and mid-April of 2021 (see Appendix A). Each of these forums addressed a different topic that had previously been identified as a concern to MPOs, and each consisted of the following elements and format.

- An introduction to the information was conducted by one or more facilitators to explain the topic and format as well as to ask participants to contribute to the subject's understanding by completing survey questions.
- Two to three expert panelists recruited by the research team made brief (10 to 20 minutes) presentations on the topic relevant to their areas of expertise.
- The information was then opened to receive and respond (generally by the panelists) to questions from participants on the virtual forum.
- After all questions had been answered or when time was running short on the 90-minute schedule, a final wrap-up was conducted by the panelists as well as the facilitator(s) to invite participants to future information forums.



The Information Forums were primarily concerned with how each of the eight discussion topics would influence the practices of MPOs and their partnering agencies, the public, and stakeholders.

Registration for the Information Forums was advertised through newsletters and emails from the AMPO, NARC, and AASHTO. The events were also advertised in direct emails sent to MPO staff and others who had registered through the Phase I MPO survey, Regional Roundtables, and prior Information Forums as well as any that had previously joined PublicInput.com (a private website/engagement vendor used for this project)—a mailing list of nearly 900 individuals. In total, over 1,000 participants joined one or more of the eight Information Forums over 2 months. The Information Forums were recorded, then edited to remove pre-event coordination among the facilitators and panelists. The edited Information Forum recordings were retained online and could be accessed with the same links used to register. Table 6-1 lists the Information Forum topic experts.

The high-level summary that follows for each of the eight topics consists of insights that were deemed most relevant and useful by the research team. The reader is strongly encouraged to reference specific summaries by topic in Appendix A as well as to consider the information provided in the Innovation Database of best practices (online) and the Toolkit for the 21st Century (Section 1 of this report). Summaries of each of the Information Forums were compiled in the form of short (approximately 3 to 5 minutes each) videos. Video links are available on the National Academies Press website (www.nap.edu) by searching for *NCHRP Research Report 1002: Metropolitan Planning Organizations: Strategies for Future Success*.

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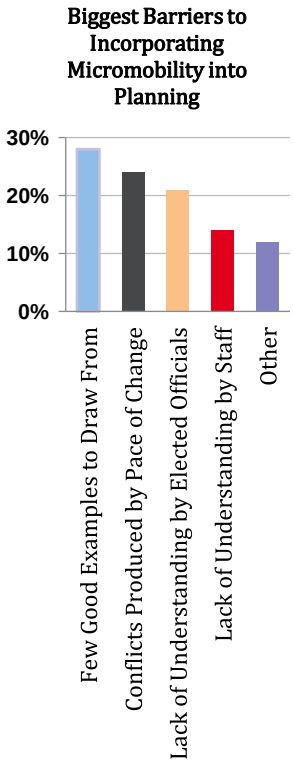
Table 6-1. Information Forum topics and expert panelists.

Micromobility
Calli Cenizal, Senior Manager, Government and Transit Partnerships, Lyft Corporation
Crissy Ditmore, Principal with Spartan Edge Consulting, LLC
Andy Boenau, Author, Emerging Trends in Transportation Planning
MPO Staff Retention and Attraction
Ashby Johnson, Director, Austin MPO
Doreen Lang, Published Author and Consultant
Social Equity
Rickey Rogers, Senior Consultant, Point Management Group
Nalungo Conley, Chief of Staff, Bay Area Metro, Metropolitan Transportation Commission
Integrating Resiliency
Kyle Schneweis, Former Director of Nebraska DOT, New CEO of High Street Consulting
Jeffrey Raven, FAIA, LEED BD+C, Associate Professor and former Director, Graduate Program in Urban and Regional Design, New York Institute of Technology
Allison Brooks, Director of Bay Area Regional Collaborative
Funding of Projects and Programs
Julie Lorenz, Kansas Secretary of Transportation
Dr. Patricia Hendren, Executive Director, Eastern Transportation Coalition
Integrating Technology
Jim Hubble, Solutions Engineer, StreetLight Data
Keli Kemp, Co-Founder, Modern Mobility Partners, LLC
Julia Billings, Project Manager, Modern Mobility Partners, LLC
Land-Use Shifts
Ashley Hand, AIA, LEED AP BD+C, Director, Communications, Unified Govt. of Kansas City, Kansas
Dr. Richard Fry, Senior Researcher, Pew Research Center
Engagement in the Time of COVID-19, and Beyond
Enrique Chaurand, Communications Director, KIPP Foundation Joni Wickham, Co-Founder, Wickham James Strategies and Solutions



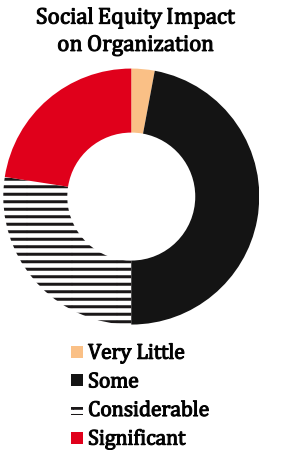
Micromobility (Andy Boenau, Calli Cenizal, and Crissy Ditmore)

- *The Individual First.* While micromobility and MaaS are areas that offer some of the fastest rates of change at this time, they are nevertheless centered on a timeless design philosophy of placing the individual squarely at the center of transportation. The original micromobility mode—walking—needs to be handled correctly. Then, future iterations of technological change can be adapted fairly easily.
- *Adaptability.* The COVID-19 pandemic and transit restructuring for first-mile/last-mile services in places like St. Louis have offered the opportunity to create clearer hierarchies of transportation service, including contracting with peer-to-peer ridesharing companies. Priorities at MPOs need to reflect projects that emphasize this small-scale connectivity between the individual and transit, bicycling, walking, and other modes of travel, including micromobility and MaaS.
- *Flexibility.* Restrictions imposed by federal funding are standing in the way of creating opportunities for more partnerships, forcing MPOs and others to identify loopholes or complex funding arrangements to implement programs and services. MPOs need to be strong advocates for changing how federal requirements support working in the micromobility space, including partnerships with private entities.
- *From Pilot to Permanence.* Micromobility programs can work as pilots, even in smaller communities, but there needs to be a plan in place for how to continue them once the pilot period is complete if it is shown to be successful.

- *Be an Innovative Partner.* There are many potential partners for micromobility programs, including healthcare providers, for example, that are using drone vehicles to deliver medicines. Strong visioning is crucial, as is proactive engagement with the public and potential partners that are here now and others that will continue to emerge in the future.

Percentage of forum participants saying that their MPO had incorporated micromobility into a Metropolitan (Long-Range) Transportation Plan: **39%**

Source: National MPO Survey.

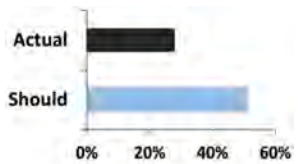


Social Equity (Rickey Rogers and Nalungo Conley)

- *Interconnected Issues.* Highlighting and addressing issues of social equity in America is long overdue, but it represents a complex and sometimes contentious set of problems. Because stakeholders come to any conversation about social equity carrying their own experiences, bias, and preconceived ideas, finding a common path forward can be elusive.
- *MPOs to the Front Line.* The challenge of creating a more just and equitable America is different than it was during the civil rights marches of the 1960s. Though the movement, led by luminaries like Rosa Parks and Dr. Martin Luther King, Jr., is now thought of as defining and heroic, in its time it was unpopular and divisive. Success addressing social equity in America has too often been the exception. In this uncomfortable reality for many, MPOs may find themselves on the front lines of these critical conversations about race and a more equitable future.
- *Confronting Changes.* Confronting systemic racism requires a systems approach, involving all levels of government alongside courts, schools, neighborhood groups, and policing. Awareness of the issue alone is not enough to create positive changes: it requires daily conversations and interactions to define and address institutional bias.
- *Equitable Outcomes in the Bay Area.* The San Francisco Bay Area, through the Metropolitan Transportation Commission (MTC), is addressing hard truths about how regional solutions can overlook impacts on communities of color and low-income earners. The MTC (an MPO) is using a tool termed the "equity platform" to assist in aligning policies, decisions, and outcomes. Four pillars lie at the heart of the equity platform: define, measure, listen, and grow. Success is not a guarantee, but it does provide a starting place for project teams to work collectively toward equitable goals.
- *Regional Justice.* The MTC applied the equity platform to their MTP update, Plan Bay Area 2050. The MTC Board adopted a series of 35 strategies, including prioritizing housing in high-resource areas, improving transit, and creating inclusive communities. Coupled with addressing systematically marginalized communities and committing to staffing equity, the MTC is advancing an effective model of how to advance equity for historically underserved and systemically marginalized groups, including low-income populations and communities of color.

Engagement in the Time of COVID and Beyond (Joni Wickham and Enrique Chaurand)

- *Opportunities and Challenges.* The post-COVID world provides an opportunity to rethink and reset how public agencies engage the communities they serve. Establishing a presence, gaining trust (difficult for government), and nonverbal communication are all harder to accomplish in a digital environment.
- *Social Inequality.* New digital tools were essential to navigating the pandemic but posed significant challenges in connecting with underserved populations. However, it should not be



Engagement as Actual High Priority v. Engagement Should be High Priority

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assumed that minority populations have low access to cell phones and the internet. The digital divide is real, with a fractured media environment encouraging different groups of people to seek information sources that are tailored to their existing behaviors and restrictions. Understanding these sources is key to reaching a diverse audience.

- *Remember To Be Interesting.* Getting people to stay engaged for 90 minutes is even harder in virtual environments, which are likely to be more commonplace for a long time. Consider giving out prizes (e.g., gift cards), flipping the script to get the participant's thoughts, or taking the computer outside to see a study area. Avoid one person talking for the entire time.
- *Choosing the Right Topics.* As engagement activities return to resembling pre-COVID levels, evaluating how to involve more and different voices will be an essential task for MPOs in the months and years ahead. Also critical is ensuring that some topics, like micromobility or car-less mobility, are not getting "over-indexed" in public discourse. The interest level in these topics may be quite different for people in different age groups.
- *Innovative Partnerships.* An important aspect of communication is finding the right voices to partner with that are trusted sources, and, at a minimum, translations of materials need to be accurate and in a voice that reflects the target population that MPOs are trying to reach. Similarly, it is important to be cognizant of who is not at the table to identify gaps in outreach and to be proactive to fill them.

"Our agency does very well with public engagement." **3%**

Source: National MPO Survey.

Integrating Resiliency (Jeffrey Raven, Kyle Schneweis, and Allison Brooks)

- *Prioritize Resilience.* Climate management activities are important, but so is prioritizing resiliency in urbanized areas that have been designed to exacerbate heat island and flooding effects. Human nature and funding streams often place resiliency and climate change management at opposite ends of a spectrum.
- *Traditional Goals Work for Resilience.* The 15-Minute City concept is a positive force for change if used as part of a comprehensive strategy for urban planning. Walkability, transit accessibility, and energy efficiency are complementary goals for planners and engineers.
- *Not Just for the Coast.* Climate change is often viewed as a purely coastal crisis, but it deeply impacts the center of the country. The severe winter of 2018/2019 created massive flooding
- that damaged or incapacitated 3,300 highways, bridges, and dams across Nebraska; 27 miles of bridges were washed away, and one-third of roadways were rendered impassable.
- *Engineering + Planning + People*. To avoid future crises, proper engineering techniques and standards have to be married to strong decision-making informed by a lot of public input. The partnerships forged during the planning stages are critical to responding to emergencies when they happen.
- *Keeping Climate Change at Bay.* The San Francisco Bay Area has experienced over 8 inches of sea-level rise, and another 12 inches to 32 inches are expected by 2050. A 3-year planning process is being undertaken now to determine how to adapt to rising tides, including prioritizing the most vulnerable assets using both hydraulic modeling and community input.

Percentage of participants that said resiliency has an increasing impact or is the primary driver of their planning products: **100%**

Source: National MPO Survey.

Integrating Technology (Jim Hubble, Julia Billings, and Keli Kemp)

- *Change or Lasting Change.* Technology advances continually shift how MPOs plan. Some hold great promise while others promise great things but do not deliver lasting change. All require understanding, adaptation, and foresight. Technology certainly influences planning processes, but if harnessed, it can be used to improve plans to better meet the future.
- *Data Collection and Access.* Seeing traffic flows in real time, understanding data patterns, and finding new trends before they manifest are all examples of how technology, and particularly big data, can transform how MPOs plan.
- *Implementing Smart Corridors.* Southern Fulton County, Georgia, part of the Atlanta Regional Commission (ARC) and MPO, defined a smart corridor project based on modeled demand. Signal preemption for emergency vehicles, buses, and trucks; safer crossings for pedestrians mid-block; and electric vehicle charging stations were planned out, but so was a secondary option if lower levels of funding were available due to the pandemic or other reasons.
- *Connecting the Dots.* Connected Vehicles (CVs) are a key part of the planning paradigm throughout the ARC, potentially reducing congestion and improving travel-time reliability as primary benefits as well as enhancing mobility options and economic growth. Corridors were classified as smart corridors, livability corridors, or economic freight corridors to help determine the package of improvements to be made that created the most benefits.
- *Mining the Store.* Mining large data sets, or big data practices, can help determine which projects will have the most benefit to a corridor or area. These practices are part of an emerging trend focused increasingly on building capacity through people-centered technology improvements.
- *Mix the Data.* Traditional (passive) data sets, like the U.S. Census reports, and nontraditional big data, like those obtained from thousands of smartphones, are best used together, taking advantage of a long history in one case and finely granulated, detailed information in the other. Both can take time and money to manage properly to their best potential to enhance decision-making.

Ratio of participants that said connected and autonomous vehicles will have a game-changing impact on how they plan: **1:10**

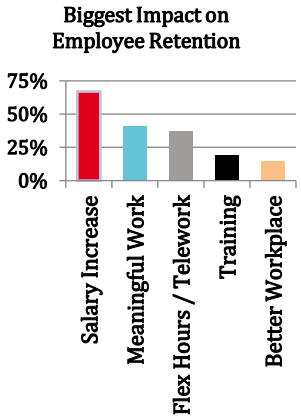
Source: National MPO Survey.

Percentage of participants that said their travel demand models are changing to meet new needs: **39%**

Source: National MPO Survey.

MPO Staff Retention and Attraction (Ashby Johnson and Doreen Lang)

- *The MPO Staffing Challenge.* MPOs have a combination of circumstances that make attracting and keeping talent challenging: hard-to-explain programs that are not generally discussed on an equal footing as traditional planning programs in higher education venues, cross-cutting issues that demand tolerance for breadth in day-to-day work activities (small MPOs), fewer pathways for advancement within the MPO itself, and smaller-market MPOs with smaller talent pools or large-market MPOs that face stiff competition for staff from other, better-understood planning and engineering employers.
- *The First 90 Days Are Critical.* Onboarding of new employees in the first 90 days of employment demands close attention by appropriate personnel who understand the organization



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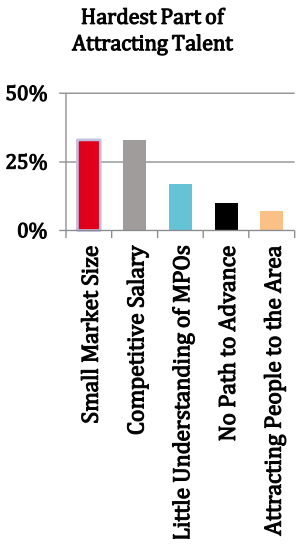

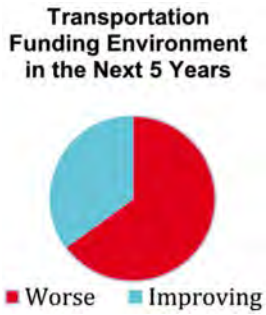

and can convey its importance to the new hire. Only half of the participants during the Information Forum said that an onboarding program exists now. Plan on taking short-list candidates out to lunch to explain the organization's functions/hierarchy and make sure that they get to meet other employees at the MPO.

- *Good Management Practices Are Universal.* There are good practices that apply to staff attraction/retention anywhere, including at MPOs: give ample praise in public, provide constructive criticism in private, focus on being a good mentor, find channels to use existing skills, and leverage the range of work the MPOs get involved with to keep the work interesting and rewarding.
- *MPOs Can Be Creative—Even More Creative than Other Planning Agencies.* Use telework and flexible work schedules (see the trend in telework interest in Figure 6-1), especially for people in special personal circumstances (e.g., caring for an elderly parent); celebrate victories, including recognition in reports and in front of MPO boards; and consider funding an incentive program.

Funding of Projects and Programs (Julie Lorenz and Dr. Patricia Hendren)

- *Funding Our Nation's Transportation Infrastructure Is a Challenge.* The gas tax has not kept up with either inflation or the needs of an aging transportation system. The Eastern Transportation Coalition is examining the impacts of replacing the fuel tax with a mileage-based user fee (MBUF), including improved reliability as transportation fleets move toward electric vehicles.
- *Making the (People's) Case.* Transportation officials are addressing the funding challenge in ways that diversify existing funding sources and think about future revenue models. In Kansas, extensive outreach resulted in a 10-year, $10 billion transportation program focusing on maintenance, multimodal infrastructure, and broadband services. Kansas Secretary of Transportation Julie Lorenz noted, "Ultimately, the transportation system is about people far more than projects. DOTs are wise to focus on people-centered solutions."
- *Emulate Success.* Learning from the private sector, understanding and testing driver attitudes, and convening a national dialogue about transportation funding solutions are critical topics to actuate. For example, the fuel tax does not send a strong price signal to people when they pay at the pump as there is little transparency toward where the money is spent.
- *Research Needed.* More study is needed to actuate an MBUF system. Overcoming challenges related to tracking/reporting vehicle mileage, trucking considerations, accurate remittance to states where the fees originate, and accounting for fees paid on toll roads are critical.

Ratio of people saying adoption of mileage-based user fee is "most promising" compared to increasing the federal fuel tax: **6:1**

Source: National MPO Survey.

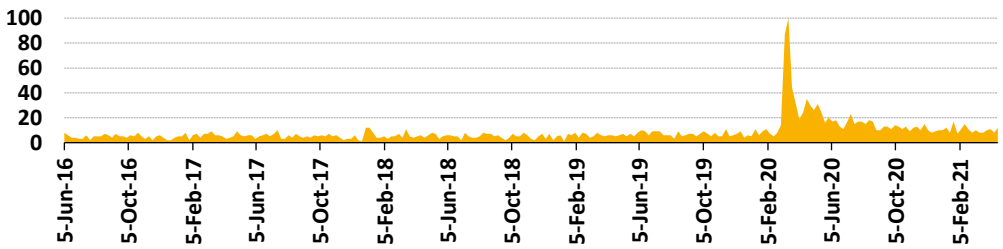

Figure 6-1. Number of searches for the term "Telework" in the United States over time (Source: Google Trends).

Land-Use Shifts (Dr. Richard Fry and Ashley Hand)

- *A New Trajectory.* The pandemic has upset traditional norms in many ways. From a data standpoint, it is still unclear just how far-reaching or how lasting the effects will be after the global pandemic has passed. Putting the changes in the context of history and emerging land-use best practices may indicate an inflection point for how land-use planning proceeds. Incorporating land-use planning into transportation planning processes was cited by 94% of survey participants in the Information Forum as being important or very important.
- *Different Population Trends Going Forward.* Slow population growth has characterized the last decade (less than 7% from 2010 to 2020), in part due to the slowing of immigration. However, longer life spans and an increasing number of people per household—for the first time in 150 years—are complicating the picture of future growth.
- *A Majority Minority.* According to the Pew Research Center, non-white, non-Hispanic populations will comprise a majority of the U.S. population by 2055, with Hispanic and Asian populations increasing substantially by midcentury.
- *Regional Growth Differentiation.* Metropolitan areas in the south and west regions of the United States will continue to see growth. This trend is not new: in 1900, 37% of the country's population lived in these two regions, and now over 60% live there.
- *Access to Digital Information.* Lack of access to the internet is exacerbating the challenges of a workforce likely to be significantly displaced and replaced by technology and automation. The disruption of supply chains, disparate effects on lower socioeconomic groups, and a sense of uncertainty have been magnified by pandemic effects and may change travel patterns differently in different regions depending on the workforce and access to technology.
- *The Importance of Land Use Exceeds Its Level of Integration.* Although 94% of survey participants said that it was important, nearly half (47%) of the survey participants during the Information Forum said that their agency was not doing enough or could do better when it comes to integrating land-use planning in regional planning activities (Figure 6-2.). Allowing data to inform, not drive, decision-making, providing real-time responses, and adaptive learning are underscoring the need for faster response times not enveloped in 20-year planning horizons and 5-year planning cycles.

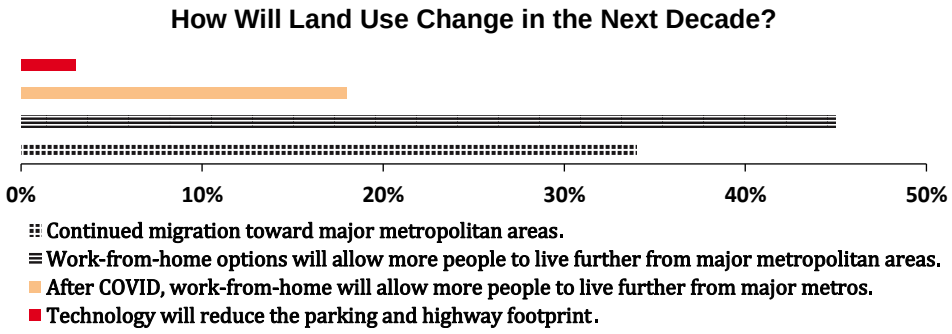

Figure 6-2. Participants' response to land-use planning in the future.

CHAPTER 7

Conclusions

The study's research products were designed to offer particular value to practitioners and the challenges that they are likely to face in the coming years. That forward-looking aspect was also the greatest challenge to this study since the future is inherently uncertain and new opportunities and issues, as well as best practices like those reported extensively here, will certainly emerge.

A second major challenge to this research effort, and to the MPOs that were its focus, is the wide-ranging nature of MPOs and the challenges, products, partnerships, and roles with which they have to work. This research project took this challenge seriously, dividing its focus into 12 different, but frequently overlapping, topics. Any of these topics are worthy of future study and have gathered the attention of researchers in the past.

- *Utilizing the Flexibility in Long-Range Planning Requirements.* MPOs are well-served to work with state and federal partners to ensure that they are spending the time and resources necessary to meet federal requirements but also to explore the flexibility in the specifics of how the requirements are met to achieve local policy goals.
- *Increasing the Relevancy of Long-Range Planning.* As time goes on, the relevancy of a 20-year plan with 5-year update cycles will continue to be challenged to provide relevancy in a rapidly shifting policy, funding, and technological landscape.
- *The Roles Are Changing in Many Areas.* The research team was frequently reminded during this study that MPOs differ greatly in resource levels, priorities, and governance. No less important is that growth rates are also uneven, with some areas in decline, some with fairly flat population growth, and others growing rapidly in recent years. These shifts, combined with changes in travel behaviors and technologies, may pose the biggest opportunities for changing, growing, and enhancing the MPO.
- *Consolidation of Research Tools Available to MPOs.* Another topic for additional research is the maintenance, and perhaps even consolidation, of research products targeted to provide best practice resources to MPOs and other transportation practitioners. This research project is not the first study to produce a list of best-practice research, a history which notably includes the former TRB Committee ADA 30's (small- and medium-sized communities) work on the Planning Digest Tool, the Victoria Transportation Policy Institute, and the U.S. DOT Transportation Planning Capacity Building program. The initial work found that these tools were not being used very often, perhaps by a lack of awareness or a lack of relevancy to current issues and target audiences. Developing a flexible, adaptable, and easily accessed online tool that serves as a clearinghouse for relevant information and practices would have great value—if it is updated, maintained, and responsive to the needs of end users. Similarly, the products of this research effort will become dated, although the range of skill sets and shifting areas of interest inherent in the MPO practice will keep some of the material in the Innovation Database and Toolkit for the 21st Century relevant for a longer period of time.

- *Efficiencies of MPO Practices.* Even with respect to differences in resource levels and regulatory contexts, some MPOs are more efficient than others in using existing resources and funding sources and using other strategies for extending resources to meet changing needs. A greater understanding is needed to address the degree to which the regulatory or political imperatives placed on MPOs can be adjusted to better apply existing resources to pursue implementation strategies, management practices, partnerships, and effective reactions to social, technological, and environmental challenges that change very rapidly.

APPENDIX A

Information Forum Summaries

The following is a summary of the conversations held for each of the Information Forums, eight in total. Panelists who are experts in the relevant fields for each topic were identified through input from the project panel and independent research. Attempts were made to seek out racial diversity in the panelists as well as to be inclusive of specific MPO opinions in both the questions asked (which differed for each Information Forum) and the knowledge of MPO structures and practices by participants where possible.

Micromobility Information Forum Summary

Panelists

Andy Boenau, New Urbanist, is a mobility strategist who produces the podcasts "How We Get Around" and "Urbanism Speakeasy." His website is www.andyboenau.com

Calli Cenizal, Senior Manager, Government & Transit Programs at Lyft Corporation, has spent over 10 years developing innovative programs and policies to create vibrant, equitable streets and communities.

Crissy Ditmore, Principal with Spartan Edge Consulting LLC, uses Mobility on Demand and Mobility as a Service strategies to ensure the public good is maximized through the application of technology to enable policy.

Topline Takeaways

The relevancy of micromobility, or Mobility as a Service (MaaS), in the MPO planning process, has increased tremendously in recent years and shows no sign of decreasing. Moving forward, policy changes at the federal and regional levels are needed to better accommodate micromobility into the MPO planning process. This will require MPOs to identify the interaction and demand between public transportation and mobility on demand (MOD) and work together with these entities to develop an overall MaaS strategy.

Key Panelist Points

Andy Boenau—The COVID pandemic has accelerated the process of Transportation Demand Management (TDM) tremendously. The lingering effect of COVID-19 on TDM remains to be seen.

"I find myself living in this Venn diagram of two worlds and both [are] related to public infrastructure. The one is the world of emerging technology. It's exciting to me: innovation that moves faster than we can predict and changes our day-to-day behavior. I'm a Gen X-er who is

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happy with change. It doesn't bother me at all, but the other world that I'm in is new urbanism. So that's walkable streets, bicycle-friendly neighborhoods—that's timeless design philosophy at a human scale, to use some of our planning jargon. So, these two worlds are often considered to be in conflict. If you go to a conference related to one or the other, you'll often hear, 'yeah, we would be able to do this if not for this other.' I think that that conflict comes because of the basic language barrier between these two. You might say in that sense I'm trying to be a Rosetta stone for these industries."

Andy encouraged MPOs to have an artist's mindset, which has led to practical inventions. He also said the perception that micromobility is a temporary glitch is one mindset, but that it is rather permanent, although changing technology is making the built environment better. He says, "The original micromobility mode walking must be safe and convenient. And if you start from there, the other things will become clearer about how you handle the conversations with the adjacent local partners."

"You want to persuade funding people . . . that you are the MPO that deserves the funding. So that goes back to storytelling. So, as you're thinking through these whys and these what-ifs, then put together memorable stories about how you are going to use technology to make your community an amazing place to be."

Calli Cenizal—Partnerships with Lyft have helped transit providers fill the gaps in service interruptions created by the COVID-19 pandemic. One example is the city of Saint Louis, which "went through a massive transit service redesign and [was] able to really establish a clear hierarchy of service by concentrating higher frequency (and reliability) in core networks where they're able to serve more people. They still were very committed and concerned about ensuring access in more suburban areas that did not have frequent or better service coverage."

There are three general categories of concepts for MPOs to explore related to micromobility.

- The first is that MPOs need to be advocates for expanding funding flexibility to include micromobility options for bicyclists. An example would be bringing back the Bicycle Commuter Act that offers tax benefits to users of their own bikes but should also include those offered through bikeshares.
- Another strategy would be to expand transit formula funding for micromobility first-mile/last-mile solutions and fill in gaps to enhance traditional transit forms.
- The third strategy is integrating options into MPO planning. "COVID has given us this opportunity to rethink how we use public space and consider how we get people to and from places safely. Thinking about how we prioritize the efficient movement of people, thinking about how we build redundancy in our transit systems, thinking about how we create better connectivity to jobs, transit, pedestrians, and just creating multiple ways for people to travel, maximizing our transportation options. And these are things that can be embedded into your planning, embedded into your priorities."

Crissy Ditmore—There is a difference between Mobility on Demand (MOD) and Mobility as a Service (MaaS). The definition of MOD is the ability to hail a mobility service without a reservation, booked through a central interface (app, web, phone) provided by a public or private Mobility Service Provider (MSP). MaaS is a framework for fulfilling public policy goals by combining all public and private transport services in a region through a central interface (web, mobile, phone) to plan, book, and pay for integrated mobility options, that are optimized to equitable outcomes for individual preferences. Therefore, Mobility Service Providers (MSP) offer Mobility on Demand (MOD) combined with public transportation to create a Mobility as a Service (MaaS) framework. MaaS is a framework, *not* an app.

Pilot projects are useful as a "sandbox" tool, but often there is no plan in place to continue the pilot after its initial run. The Federal Transit Administration (FTA) website has information on a lot of example projects and outcomes.

To achieve results, MPOs are going to have to move out of comfort zones and measure individual outcomes. "Public engagement is one area where you actually can lead and facilitate coordination of conversations so that when you go after that funding, you're going to score higher because you've already brought all of the external potential partners to the table to say, this is what we really want to target."

Ms. Ditmore also noted a recent Texas A&M study conducted on healthcare delivery by drone vehicles. The point is that there is a lot of overlap with healthcare, technology, and transportation delivery of services. A good amount of visioning is important, as is finding the loopholes that others have already discovered to fund and implement these services.

Participant Survey Results

What is the biggest challenge for your organization to integrate micromobility, mobility on demand, and other tech-driven mobility solutions into your plans and processes?

Concern about the rapid pace of change conflicting with long-term solutions	24%
Lack of understanding on the part of staff	14%
Few good examples of this are done elsewhere to draw upon	39%
Lack of understanding of the subject for elected officials	21%
Other	12%

Have you integrated micromobility in a long-range plan or similar study (more than one may apply)?

Yes, for Metropolitan Transportation Plan	39%
Yes, for Active Mode (bike, walk, transit) Plan	30%
Yes, for Corridor Study Design, or Plan	21%
Yes, for some other Study or Plan	21%
No	30%

Staff Attraction and Retention Information Forum Summary

Panelists

Doreen Lang is president of Hang on to Your Stars LLC, a training and consulting company specializing in saving clients a fortune in turnover through employee retention strategies.

Ashby Johnson is the Executive Director of the Capital Area (Austin, Texas) Metropolitan Planning Organization (CAMPO)

Topline Takeaways

For MPOs to better hire and retain quality staff, MPOs must recognize that the labor force has more options in the workplace and, as a result, employees have more value. As a result, MPOs need to institute practices, such as better onboarding techniques and providing more opportunities and encouragement to their current and future employees.

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Key Panelist Points

Doreen Lang—Due to shrinking family sizes and labor force, staff retention has become a serious problem over the past years. As a result, employee turnover is costing organizations trillions of dollars related to production loss, rehiring efforts, knowledge loss, and lessened morale. The main causes for employee turnover are lack of training, unclear expectations, and personal conflicts with other employees.

The onboarding process is one of the most critical steps for ensuring employee retention. Surveys indicate over 69% of new employees are more likely to stay for at least 3 years after a great onboarding experience. Because millennials have more choices on the job market, organizations are having to put together great onboarding programs to get them excited about a career with that organization. Other key elements to staff retention include involving your employees and drawing on their expertise, allowing them to use their past experiences, encouraging them to share ideas, and showing appreciation for their actions.

A good, gradual onboarding process lasts for roughly 90 days. Afterward, it is important to prepare your organization for a multigenerational workplace.

Ashby Johnson—The two key elements to onboarding new staff are posting an opening and the interview process. The job posting needs to have several key components, including 1) a clear description of your ideal candidate; 2) an accurate description of your office culture; 3) a defined salary range; and 4) a description of benefits (pension, high 401k match, and insurance). Collectively presenting these elements does a better job of attracting candidates who are excited about the position and who enter the onboarding process with a clear expectation of the job posting.

The interview process should be more personal. It should include activities to get to know your candidate such as introducing them to a few people in the office, maybe taking them for lunch. It is also important to explain the overall organizational chart and growth opportunities to gauge their excitement about the organization.

An important role in retaining staff is reinforcing an employee's value to the team. Key steps for the employer include assigning meaningful projects, explaining why they are important, and encouraging training opportunities—especially cross-training and team dynamics. Another critical step is to provide ongoing feedback throughout the year prior to annual reviews and provide raises and title changes as merited. Given the importance of collaboration in the workplace, it is also important to avoid hiring lone wolves into an organization.

Another key element of staff retention is creating a live-work environment. Actions to foster this environment include supporting flexible work hours and teleworking and providing flexible hours for parenting or caretaking activities.

Last, a key role of leadership for retention is to give opportunities and credit to employees for their accomplishments. Sample actions include the recognition of employees in front of the policy board and listing their names in completed documents.

Participant Survey Results

What is the hardest part about attracting talent to your organization?

Small Market/Not Many Candidates Locally	33%
Little Understanding of MPOs and Work	17%
Competitive Salary/Benefits	33%
Not a Path to Advance within the Organization	10%
Attracting People to the Area Generally	7%
Other?	0%

Do you have an effective onboarding program for new employees?

Yes	54%
No	48%

What would make retaining good staff easier to your organization (Pick two)?

Salary Increase	67%
Flexible Hours/Telework Support	37%
Better Workplace Environment	15%
Meaningful/Interesting Work	41%
Training and Professional Development Opportunities	19%
Something Else?	0%

Engagement in the Time of COVID-19 and Beyond Information Forum Summary

Panelists

Joni Wickham, Co-Founder, Wickham James Strategies
Enrique Chaurand, Senior Director of Communications, KIPP Foundation

Topline Takeaways

The post-COVID world provides an opportunity to rethink and reset how public agencies engage the communities they serve. New digital tools were essential to navigating the pandemic but pose significant challenges in connecting with underserved populations. The digital divide is real. The global pandemic has shone a bright light on inequities. As engagement activities begin to resemble pre-COVID levels, evaluating how to involve more and different voices will be an essential task for MPOs in the months and years ahead.

Key Panelist Points

***Joni Wickham*—**Communication with stakeholders has been difficult during the pandemic. Even prior to COVID, the fractured media environment makes identifying the channels by which stakeholders hear about projects and choose to get involved increasingly hard. Understanding where diverse stakeholders go for information is key to reaching them. Practitioners need to know where their audience gets their information. For some, that is traditional broadcast and print media, but increasingly it is digital in nature. A first step in engaging with a community is to understand how best to reach those who need to be involved. Talking with neighborhood leaders and influencers about how they reach one another can help to identify the most effective communication channels. What works for one set of stakeholders may not work for another. Flexibility and adaptability are key. Additionally, knowing who is best positioned to deliver messages to stakeholders will help the reach and acceptance of a message. Do the people asking for input reflect the neighborhood or stakeholder group you are engaging? Take the time to identify trusted champions. Finally, look around the table and ask, "Who isn't here?" Often critical voices are missing from a community conversation. Work to make sure a diverse array of stakeholders is informing decision-making processes.

***Enrique Chaurand*—**The digital divide is a significant barrier to connecting with underserved populations. The KIPP Foundation worked hard at the beginning of the pandemic-related lockdown to supply students with at-home computers as well as internet hot spots. Technology

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without the means to connect to the internet is meaningless. Understanding stakeholder needs when it comes to connectivity is an essential part of connecting with them. Cell phone use in communities of color is high. Utilizing apps that connect via text or ask for input in a mobile-device-friendly way can expand the reach of outreach efforts into hard-to-reach populations.

Make no assumptions and make sure culturally competent elements are part of the outreach plan. Minority communities are not monoliths. What works for some may not work for others. When translating into languages beyond English, it is important to understand what dialect is spoken in the community you are engaging. Practitioners lose credibility when translations or outreach efforts are not reflective of the community. Engaging, listening, and learning from community leaders will help to increase the effectiveness of outreach efforts.

Participant Survey Results

How high of a priority should your agency place on public engagement?

Not a high priority	3%
A moderate priority	3%
A high priority	44%
A very high priority	51%

How high a priority does your agency place on public engagement?

Not a high priority	3%
A moderate priority	28%
A high priority	44%
A very high priority	28%

Does your agency do enough to reach out to communities that are difficult to engage?

No, our agency does not do enough	18%
Our agency could do better	49%
Our agency is doing well and improving	31%
Yes, our agency does very well	3%

Land-Use Shifts Information Forum Summary

Panelists

Dr. Richard Fry, Senior Researcher at the Pew Research Center
Ashley Hand, Director of Strategic Communications for the Unified Government of Kansas City, Kansas Wyandotte County, Co-founder of Cityfi

Topline Takeaways

There is no doubt the pandemic has upset the applecart in many ways. From a data standpoint, it is still unclear just how far-reaching the effects will be on the nation. It is unknown if the changes will be permanent or temporary. Putting the changes in the context of history and emerging land-use best practices may indicate an inflection point for how land-use planning proceeds.

Key Panelist Points

Dr. Richard Fry—Humility is required when examining the effect the pandemic has had on housing demand and land use. Researchers do not have enough information to get a full picture

of how the pandemic will change the nation. History does provide some clues as to the general direction the country is headed. The last decade has seen the slowest amount of population growth since the 1930s. From 2010 to 2020 the U.S. population has grown less than 7%. Over the last half-century, immigration has been the engine driving population growth. Immigrants, children, and grandchildren of immigrants accounted for more than half of the last 50 years. Part of the reason the U.S. population is down in the last decade is that immigration has slowed. If the U.S. population is going to expand, immigration will be an important factor in the decades ahead.

Further complicating the population and housing picture is a reduction in the number of people per household. Older generations are living on their own longer. Prior generations moved in with children as they aged. For over 150 years, the trend has been a reduction in the number of household members per household. However, in the last few years, experts are seeing an increase in the number of people per household again. Immigration has impacted that trend.

By 2055, the Pew Research Center projects that 48% of the U.S. population will be non-Hispanic white. For the first time, the U.S. white population will be a minority. The trend line is driven by the Hispanic population, which is projected to grow from 18% of the population in 2018 to almost 25% by midcentury. Over the same time period, the nation's Asian population is projected to double. Changing ethnic and racial demographics will influence the types of housing that will be required and desired in the years ahead.

Metropolitan areas continue to grow as population centers. The nation has 53 metro areas with over a million residents. Over 65% of the nation's population lives in these 53 metros. A continuing trend over the 20th century has been growth in the southern and western regions of the country. In 1900, 37% of the nation lived in the south and west, by 2017 over 60% lived in those growing regions.

Ashley Hand—The pandemic has shone a spotlight on some of the core concerns facing the nation. Forty-two million Americans are without access to fixed or wireless broadband. American workers are facing the prospect of 44% of jobs being automated in the future. As a planet, we are facing a real threat as we look for ways to mitigate the effects of climate change. In that context, it is perhaps no wonder the United States ranks 19th in the world when it comes to happiness. In order to maximize the potential of the years ahead, a triple bottom line model that balances equity, economy, and environment may be useful in guiding land use and planning decisions.

The pandemic has had a global impact exacerbating socioeconomic inequity, disrupting supply chains, and increasing the feeling of uncertainty. It begs the question of what kind of interdependence should we be having as regions. In some ways, our reliance on a connected world has been tested because of the pandemic.

How do communities "future-proof" their decisions? On top of the pandemic, the last five years witnessed more than ten $1 billion weather events. The trend of intensifying weather events that cause significant disruption and destruction will continue. Uncertainty seems to be the only certainty. The pandemic also demonstrated in real time the nation's ability to adapt and adjust. People moved to remote working, schools and teachers connected with students in different ways, and public health agencies mobilized in ways not thought possible. Some positive lessons can be gleaned from the trauma of the last year. Repurposing the tools used for planning and creating new tools may produce better results.

Thinking in terms of whole systems, being proactive in strategies, letting data inform decisions, providing real-time responses and adaptive learning are all new tools that can be used to better shape the future. Transportation and land use are perfect complements to future-proofing decisions. Recognizing mobility as a right for all is a foundation of a healthy economy and changes how we look at land use. Defining a standard for the quality of life a community seeks can be a powerful tool to provide context for.

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Participant Survey Results

How do you see land use potentially changing in the next decade?

The population will continue to migrate toward major metropolitan areas	34%
After COVID, work-from-home will allow more people to live further from major metros	45%
Social equity discussions will renew our focus on affordable housing	18%
Technology like autonomous and connected vehicles will reduce the parking and highway footprint	3%

How would you rank the need for integrating land-use planning into your transportation planning processes?

Not necessary	0%
Good to integrate where possible	6%
Important to transportation planning	27%
Essential to transportation planning	67%

How integrated is land-use planning into your regional planning activities?

No, our agency does not do enough	30%
Our agency could do better	17%
Our agency is doing well and improving	47%
Yes, our agency does very well	6%

Resiliency for Real Information Forum Summary

Panelists

Jeffrey Raven, FAIA, LEED BD+C, Associate Professor and former Director, Graduate Program in Urban and Regional Design, New York Institute of Technology
Kyle Schneweis, Chief Executive Officer of High Street Consulting Group
Allison Brooks, Executive Director of the Bay Area Regional Collaborative (BARC)

Topline Takeaways

Resiliency in planning efforts takes multiple forms and is increasing in relevance as the nation struggles with issues of equity and climate change. Trends in urbanization provide benefits for mobility but increase concerns about carbon emissions. As weather events continue to intensify because of climate change, transportation infrastructure continues to be hit hard. MPOs will be challenged to work with their partners to navigate this uncertain future, harden assets, and plan for a changing climate.

Key Panelist Points

Jeffrey Raven—Design and planning schools have long taught the importance of dense urban environments to address many of the equity issues facing society. Those same compact settlements that provide for more accessible services, transit, and education amplify the impacts of climate change. To reduce the impact of heat and flooding, cities need to enhance high-quality, low-carbon lifestyles. The challenge to this solution is poorly designed urban "concrete jungles." Resiliency is part of a two-sided coin balanced with climate mitigation. Urban policy should prioritize climate management activities designed to reduce the greenhouse gas effect while also increasing climate resilience to reduce urban heat and flooding.

These should be complementary goals, but often human nature and funding streams put them on opposing ends of the spectrum.

As conversations have emerged about a "15-minute city," resilient transportation that promotes mobility, accessibility, and proximity is critical to achieving urban areas that reduce sprawl and carbon emissions. Understanding how to design cities where the urban function and form mitigate climate effects is a new frontier in comprehensive urban planning.

Cities will need to reduce heat and greenhouse gas emissions through energy efficiency, transit access, and walkability while modifying the form and layout of buildings and districts in addition to increasing vegetative cover. These thoughtful innovations in planning can help find the balance between efficient, compact cities and a reduction in greenhouse gases.

Kyle Schneweis—After a cold winter in 2018/2019 that saw four or five major blizzards and significant rainfall across the plains, Nebraska suffered from massive flooding. Highways, bridges, and dams all fell victim to floodwaters across the state. Of the 10,000 miles of highway in Nebraska, 3,300 were closed; one out of every 3 miles of highway was impassable. Twenty-seven bridges were washed away and hundreds of miles of roadway were carried away with the flood waters.

Critical conversations were conducted quickly to determine how to build back and repair the infrastructure lost to the catastrophic flooding. In many cases, whole towns were cut off from the rest of the state because of roadway loss. All totaled, Nebraska suffered $150 million in damage to state highways and another $50 million in local streets, roads, and bridges.

Focusing on how resilient a system can remain during an extreme weather event is complemented by planning to build structures to withstand future events. Critical to that planning is engaging with residents in meaningful decision-making discussions. Partnerships are critical and need to be built prior to tragic events so they are in effect when the time comes.

Allison Brooks—The Bay Area is confronting resiliency from multiple angles. Addressing wildfires, earthquakes, and flooding due to rising sea levels are all part of the planning work being undertaken on the West Coast. The effort improves ecology, manages risk to infrastructure, and prioritizes the needs of frontline communities.

The Bay Area has already experienced over 8 inches of sea-level rise. By 2050, experts estimate 12 to 32 inches of additional rise. To prepare, the Bay Area Regional Collaborative has undertaken a 3-year planning process to adapt to rising tides. Partnerships locally and at the state and national levels are essential to tackling the complicated task of addressing the challenges of climate change. The magnitude of addressing the substantial sea-level rise predicted requires an all-agency, whole of government response. Partner agencies and the public are key to prioritizing resiliency efforts. There are not resources enough to address all needs simultaneously. The Bay Area has worked to identify the most vulnerable assets and prioritize those investments above others. Hydraulic modeling and community engagement provide both a clear indication of the severity of the issue and a path forward for resiliency efforts.

Participant Survey Results

How would you best describe the level of your agency's commitment to resiliency in transportation planning?

We have not yet planned for resiliency in the context of transportation	0%
We are beginning to discuss resiliency as a factor in planning	46%
Resiliency is a part of our transportation plans	46%
Our agency places a high priority on resiliency in transportation planning	0%
I do not know	8%

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How much do you believe resiliency should be part of MPO planning efforts?

I do not believe resiliency is vital to our planning efforts	0%
Resiliency has a minor impact on our planning efforts	0%
Resiliency has an increasing impact on our planning efforts	71%
Resiliency should be a primary driver of our planning efforts	29%
I do not know	0%

Transportation Funding Information Forum Summary

Panelists

Julie Lorenz, Secretary, Kansas Department of Transportation (KDOT)
Dr. Patricia Hendren, Executive Director, Eastern Transportation Coalition

Topline Takeaways

Funding our nation's transportation infrastructure is a challenge. The gas tax has not kept up with either inflation or needs. Transportation officials are addressing the challenge in ways that diversify existing funding sources and think about future revenue models. Learning from the private sector, understanding and testing driver attitudes, and convening a national dialogue about transportation funding solutions are critical.

Key Panelist Points

***Secretary Lorenz*—**Investments in transportation have long held the promise of bringing economic prosperity to communities large and small. In Kansas, the system relies on a balanced revenue model that includes the fuel tax, a portion of the state's sales tax, and tolls and fees. This model has proven to be relatively stable, but as vehicles change, how new models are fueled will need to be examined. In Kansas, an extensive outreach effort resulted in a 10-year, $10 billion transportation investment program nicknamed "IKE." Using scenario planning to help understand and plan for future needs, the IKE program is multimodal, invests in broadband, and prioritizes preservation. Ultimately, the transportation system is about people far more than projects. DOTs are wise to focus on people-centered solutions.

To address transportation's funding challenges will take collaboration at all levels of government and consultation with the people the system serves. Issues of safety, equity, and health will be at the center of transportation discussions in the near future. DOTs will be challenged to think about transportation networks in ways that are different than we have in the past. How can DOTs reduce the impact on our global environment? As an agricultural state, Kansas's impact is not only from the fuel we use but also from the crops grown and the livestock that grazes in the state. As DOTs rise to meet the funding challenges, they are asked to place transportation in a larger societal context. Opportunities exist to advance transportation funding. Placing people first will be key to future successes.

***Dr. Hendren*—**The Eastern Transportation Coalition is at the forefront of examining the impacts and practicality of replacing or augmenting the fuel tax with a mileage-based user fee (MBUF). The reality is the current fuel tax-based system cannot keep up with the demands of an aging transportation system. Since it was last updated in 1993, the fuel tax has lost buying power and failed to compensate for the advent of electric cars. As electric cars make up a larger portion of America's fleet, transitioning away from a fuel tax may provide more funding stability.

The fuel tax collection method provides little transparency to drivers. Few connect what they pay at the pump to how transportation systems are funded. The MBUF studies conducted by the Eastern Transportation Coalition have tested methods, like invoicing, to see how drivers respond. A better understanding of how roads and bridges are paid for leads to more support for alternative funding mechanisms like MBUF. Beyond public acceptance, several logistical hurdles exist to implementing an MBUF revenue model. Tracking and reporting vehicle mileage, accessing interstate trucking needs, remitting fees to the correct state and local jurisdictions, and accounting for fees paid on toll roads are just a few of the complicated issues the Eastern Transportation Coalition is studying. The Coalition has provided a critical East Coast perspective to a growing national conversation about alternatives to the fuel tax like MBUF. More study is needed, and like the work in Kansas, the priority is on the needs and motivations of people.

Participant Survey Results

How would you assess the impact of levels of transportation funding on your organization?

Very little impact	1%
Some impact, but manageable	29%
Considerable impact	44%
Significant impact	26%
Other	0%

How do you see the transportation funding environment in the next 5 years?

Worsening significantly	5%
Continue to be challenging	60%
Slightly improving	24%
Improving	10%
Significantly improving	1%

What do you see as the most promising advancement in transportation funding?

Increases in state fuel tax	16%
Increase in the federal fuel tax	10%
Adoption of Mileage-Based User Fee	63%
Increases in vehicle registration fees	10%
Forego new construction and focus on preservation or small-scale projects	1%

Social Equity Information Forum Summary

Panelists

Rickey Rogers, Senior Consultant at Point Management Group, identifies and mentors Minority/Disadvantaged Business Enterprises (MBE/DBE)

Nalungo Conley, Administrative Director/Chief of Staff, the Metropolitan Transportation Commission (MTC) of the San Francisco Bay Area

Topline Takeaways

Highlighting and addressing issues of social equity in America is long overdue, comprised of a complex and often contentious set of problems. Because stakeholders come to any conversation

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about social equity carrying their own experiences, biases, and preconceived ideas, finding a common path forward can be elusive. The challenge of creating a more just and equitable America is different than it was during the civil rights era of the 1960s. Though the movement led by luminaries like Rosa Parks and Dr. Martin Luther King, Jr. is now thought of as heroic, in its time it was unpopular and divisive.

Success addressing social equity in America has too often been the exception, not the rule, although much has been learned for those wishing to seek and apply lessons from the past and present. MPOs are on the front lines of these critical conversations about race and a more equitable future.

Key Panelist Points

Rickey Rogers—The march toward racial equality has been a long journey that is far from complete. America has enjoyed some hard-fought success in its uniquely American dilemma, but we are called in this moment to redouble collective efforts to reach a more just political, social, and economic reality for minority members of our communities. Confronting systematic racism requires a system-wide approach. Local, regional, state, and federal governments alongside neighborhoods, courts, policing, and educational institutions are all required for progress to be real. Many problems plaguing America can be traced back to racial bias, prejudice, intolerance, and hatred. In the past, leaders of the civil rights movement were united in their belief that raising society's awareness of racial inequality could lead to change. In the decades since, that theory has been tested. Awareness alone is not enough.

To make progress, stakeholders need to become comfortable in the uncomfortable. It is a daily conversation that impacts decisions big and small. The way forward relies on those with institutional privilege relinquishing some of their advantages. As a society, we all gain when more voices are heard, when we understand and invest in equity, and when we see each other as equals in our American journey.

Nalungo Conley—The San Francisco Bay Area is working to address equity at a regional scale. Discussions around equality had reached a crescendo as public agencies and MPOs grappled with the hard truths that policies and systems intended to solve regional problems have negatively impacted and harmed low-income earners and communities of color. Often as a practice, we have not oriented our conversations around reaching equitable outcomes.

The MTC is using what they call the "equity platform" to assist in aligning policies and decisions with just outcomes. The process framework is built on four pillars: define, measure, listen, and grow. Those pillars help to center projects and programs in equity. The platform helps the MTC operationalize equity through specific measurable, relevant, and achievable outcomes. The approach does not guarantee success, but it does provide a foundational starting point for project teams to work collectively toward the same goal.

The MTC used this framework when updating their long-range plan called "Plan Bay Area 2050." The plan took a hard look at the outcomes and impacts of previous plans across four areas: transportation, housing, economics, and environmental strategies. Across all, the outcomes when viewed through a lens of equality were less than ideal. To address the clear issues raised by the plan review, the MTC Board adopted a series of bold strategies to help make equitable outcomes a reality. The new set of 35 strategies included prioritizing housing in high-resource areas, focusing on improving transit, and creating inclusive communities. Combined with a real commitment to staffing equity initiatives and investing in ways that positively impact systemically marginalized communities, the MTC is modeling what MPOs can do to advance racial justice at a regional level.

Participant Survey Results

How would you assess the impact a renewed focus on social equity will have on your organization?

Very little impact	3%
Some impact, but manageable	48%
Considerable impact	28%
Significant impact	23%

How would you assess your organization's readiness to deal with issues surrounding social equity in your community?

Not ready at all	4%
Somewhat prepared	46%
Moving in a positive direction	44%
Very prepared	6%

Technology in Transportation

Panelists

Keli Kemp, AICP, PTP, Co-founder of Modern Mobility Partners, LLC, an Atlanta-based DBE, full-service transportation planning firm.
Julia Billings, AICP, Project Manager at Modern Mobility Partners, LLC
Jim Hubble, AICP, Solutions Engineer Manager at StreetLight Data

Topline Takeaways

Technology advances continually shift how MPOs plan. Some hold great promise, others promised great things but did not deliver. All require understanding, adaptation, and foresight. Technology certainly influences planning processes, but if harnessed, it can be used to improve plans to better meet the future. Seeing traffic flows in real time, understanding data patterns, and finding new trends before they manifest are all examples of how technology, and particularly big data, can transform how MPOs plan.

Key Panelist Points

Keli Kemp and Julia Billings—The Southern Fulton comprehensive transportation planning (CTP) effort near Atlanta included eight cities as well as a small, unincorporated portion of the county, all within the Atlanta Regional Commission (ARC) MPO boundary. Typically, a CTP is a master list of prioritized transportation projects across all modes that are fiscally constrained in the short term based on anticipated revenues. Being listed on the CTP is a prerequisite for accessing federal transportation funding. The Southern Fulton effort had a large focus on emerging new technologies from the start of the planning process.

The project identified a smart corridor network based on traffic models. The corridor included a requirement for fiber to be laid as part of widening and new construction. The traffic signals on the corridor would communicate with one another and provide for signal preemption for emergency vehicles, buses, and trucks on designated corridors. Mid-block pedestrian crossings would feature smart, flashing beacons. Bikes would have signals and EVs would have charging stations along the corridor. The plan also balanced these recommendations with an analysis of a reduced funding scenario tied to disruptions in fuel tax revenues from the pandemic or electric vehicles.

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Connected vehicles were part of the planning for smart corridors throughout the planning area. They represent an advancement in system efficiency that supports future growth. The technology in connected vehicles also makes innovative approaches to reducing congestion and increasing travel-time reliability possible. In short, connected vehicles and smart connected infrastructure investments support mobility options and economic growth.

One unique aspect of the CTP was the development of a corridor framework that connected technology, traffic patterns, and land use. Three unique types of corridors were identified as part of the plan—Smart Corridors where technology upgrades were most beneficial and improved safety and operations, Livability Corridors with high bicycle and pedestrian needs because they supported commercial, residential, and mixed-use activity centers; and finally, Economic Freight Corridors that focused on improving freight and economic activity. Each corridor had different needs, but each used technology to improve transportation performance.

Jim Hubble—The promise of "Big Data" and its impact on transportation comes from mining vast, mostly anonymized data sets to map current conditions more accurately and predict future behavior based on real work scenarios. The planning world is complicated. MPOs' plans are subject to the influences of compounding forces and disruptors that make everyday life more challenging. The effects of the pandemic and the changing social forces confound planning further. With a renewed focus on stretching transportation dollars and making investments that are multimodal and multifunctional, Big Data can be a way to maximize dollars by maximizing the efficiency of each project.

Nationally, we are seeing trends that move away from building capacity and toward operating the existing capacity better. Using data to make people-centered rather than vehicle-centered decisions is a positive advancement in planning.

Data can be broken down into two sets. Traditional data sets include the U.S. Census Household and Intercept Surveys, aerial photos and videos, Bluetooth and other cell signal-related sensors, and assumption-based modeling data. Traditional data is familiar and typically available. It is understood and has been widely used, in some cases for decades. It has drawbacks, including the expense and time-consuming methods needed to analyze and make use of the data. It has relatively small sample sizes and can be outdated.

Big/Passive Data utilized sources like smartphones, connected vehicle data, transit and toll pass readers, and other Big Data modeling sets. These data sets represent massive sample sizes and are empirical and objective in their results. They advance modeling in the level of granularity they can produce and evolve as new data sets come online. But analysis can result in huge file sizes and processing, and clean-up can be time consuming and require expertise. Big Data has a relatively short track record of success and can often be incomplete.

Plans are best when a mix of traditional and Big/Passive Data sets are used to understand transportation needs. Focusing on what is in the control of the region and looking for opportunities to collaborate can result in improved models and policies. MPOs should constantly reassess new technology and data sources to improve and evolve their processes.

Participant Survey Results

How big an impact do you think autonomous and connected vehicles will have in your planning efforts?

A game-changing impact to how we plan today	10%
A significant impact particularly in the long-term	33%
It may impact some demand, or change our models, but more gradually than we expected	38%
The effect is over-hyped, and we may not see much change	19%

What do you think is the best practices currently for travel surveys?

Nothing is better than traditional surveys!	10%
Surveys are so 2019, it's all about passive data now	10%
Traditional + passive make the perfect partnership	48%
Undecided	33%

Are your agency's travel demand models evolving?

Yes, they are changing to meet new needs	39%
They haven't yet changed significantly, but we recognize the need	52%
We are leaving our models as they have been but using other means to adjust to changing metrics	4%
No, our agency will continue to model travel demand as we have been	4%

APPENDIX B

Regional Roundtable Summaries

Regional Roundtable Discussion Sample Meeting Agenda

Welcome and Introductions
Research Overview
PowerPoint Presentation
Questions to Consider During Regional Roundtable Discussions
Part I of Regional Roundtable Discussion

- MPO Directors' overview of their 3C planning process
- Discussion of Challenges and Opportunities experienced and facing MPOs and agency partners in the 3C planning process
- Identification of potential enhancements or changes to the 3C planning process
- Noteworthy best practices

Part II of Regional Roundtable Discussion

- MPO major policy issues identified from Polling
- MPO and agency partner potential actions to address MPO major policy issues using the 3C planning process

Next Steps
Regional Roundtable Discussion Reports
Follow-up Questions and Resource Materials

Sample Regional Roundtable Discussion Questions

The metropolitan planning organization (MPO) attendees were selected based upon recommendations received from the Association of Metropolitan Planning Organizations and the National Association of Regional Councils. Agency partner attendees were selected based on recommendations received from the MPOs within each state. For two multi-state roundtables, the course of the discussion was unique, depending on the specific contexts of the work being undertaken at the MPOs. There were no non-MPO participants at the two multi-state Regional Roundtables.

Participants were informed at the outset of each Regional Roundtable that the objective of this project is to develop a comprehensive resource to inform and guide the evolving roles and functions of MPOs in partnership with their key stakeholders for the 21st century. Regional Roundtable discussions are intended to provide MPOs and their agency partners an opportunity to examine the storied 3C (continuing, cooperative, and comprehensive) planning process and identify how that process could be improved to better address MPO major policy issues. Part I of

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the discussion focuses on identifying best practices, challenges, and opportunities in implementing the 3C planning process. Part II of the discussion focuses on identifying some major policy issues facing MPOs and their agency partners and how to collectively best address those issues in recognition of the following shifts to each "C:"

- **Continuing**—Many MPOs have a long institutional life, although new MPOs will emerge and existing boundaries may change as a result of the United States Census;
- **Cooperative**—MPOs need to navigate changes to relationships with adjacent MPOs and existing or new provider partnerships; and
- **Comprehensive**—Comprehensive now encapsulates rapidly evolving technologies, demographic/cultural trends, and potentially expanded or altered roles such as economic development or project funding.

Part I: Questions to consider during the Regional Roundtable discussion:

How can MPOs and their agency partners be poised and equipped to better address current and future opportunities and challenges (pandemics, market disruptions, or other unexpected events)?

What strategies can be used to improve the efficacy of MPOs and their agency partners in implementing the 3C planning process?

Should the roles, responsibilities, and resources of MPOs change in relation to their state, regional, and local transportation partners?

What are some noteworthy best practices in the 3C planning process that could be replicated (or not) by other MPOs or Agencies?

Part II: Addressing major policy issues using the 3C Planning Process

In advance of the Regional Roundtable discussion, the MPOs and their agency partners will be asked to identify three MPO major policy issues that are facing MPOs and their agency partners. Examples might include changing demographics, unexpected events such as pandemics, or identifying planning requirements that could use additional guidance from research institutions, FHWA, FTA, or a state.

The results of the polling will be presented at the Regional Roundtable discussion. Afterward, the attendees will be asked to describe what steps they could take in tandem with one another to address MPOs' major policy issues. This might include, for example, enhancements or changes to the 3C planning process. It could also include changes to MPO activities such as long-range transportation plans, data and analysis, corridor and area studies, transit, and bicycle/pedestrian planning or programs.

Summary of Regional Roundtable: Idaho–Montana–Wyoming

February 10, 2021
2:00 pm–3:30 pm EST

Attendees

Aaron Wilson, Missoula MPO
Tom Mason, Director, Cheyenne MPO
Mori Byington, Director, Bannock TPO (BTPO)

Wade Carroll, Project Manager, Metro Analytics, PLLC
Scott Lane, Principal Investigator, Metro Analytics, PLLC
Matt Miller, Principal Analyst, Metro Analytics, PLLC

Summary of Discussion Topics

MPOs are very partnership- and collaboration-oriented. Describe a recent experience where such a partnership worked or one that did not work out as well as hoped, and why.

- BTPO: New interchange in the north part of the community; working with local partners and state DOT and private development; moved to a secondary/support role – typical as project moves from planning to design to construction; first PPP in Idaho; overcame federal/state requirements to facilitate the project development.
- Missoula: Mountain Line transit provider; zero-fare transit; MPO worked with transit provider using CMAQ dollars annually to keep it zero-fare; ridership nearly doubled in three years (70% in two years), which led to more grants to get electric vehicles in part based on an increase in ridership; $350,000/year to transit leveraged many millions of dollars in grants, bus stops, access; transit service is its own taxing jurisdiction.
- Cheyenne: Connect 2045 LRTP worked with the city on a future land-use map (which is typical in terms of their coordination) that fed into the land-use component of the TDM.
- Cheyenne: Worked with CDOT on passenger rail of the North Front Range; some talk of doing additional planning with Colorado and Cheyenne MPO would manage that type of project; the study is moving forward and evolving.
- Cheyenne: Cheyenne Frontier Days talked about doing a transportation plan (park-and-ride, bus system, circulation) that was successful; some implemented and more coming.

Tectonic shifts are happening nationally and globally in demographics, technology, and communication. How are these changes impacting your organization, or have they impacted it?

- Missoula: An increase in e-bikes that can be seen and discussed at bike shops (popular destination and more people moving into the state/area; some retirees and some aging challenges); had to manage the e-bikes on infrastructure that was designed and built in the 1990s (pedestrian, scooters, and e-bikes on a 10 ft multi-use paths) so there is a re thinking of regulation and design.
- Missoula: Getting different people engaging through virtual means; there is a struggle to get other groups to get access to computer/internet; hard to have one-on-one in a virtual setting.
- Cheyenne: Started LRTP update with an economic forecast of 1% and modified to 1.28% per year and now that seems too low—many leaving California and Colorado to Wyoming; Microsoft has been expanding operations; a new business park on the south side of downtown with another new, high-tech company is coming in.
- Cheyenne: Growth is forcing new thinking on how demographics are impacting traffic forecasts.
- Cheyenne: Going to a virtual public meeting format (MetroQuest for surveys) that got similar or greater attendance; probably staying with virtual for a while going to a mix later on (virtual and in person); shifted to social media for advertising using a consultant to modify/update the MPO web page/Facebook page; probably not reaching non-tech-savvy parts of the community.
- BTPO: Transfer of people moving out to other urban areas (younger people for jobs) and older people that are retirees or remote workers coming into the area; people working at a site leaving and people working from home, coming into the area.

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- BTPO: This may impact the TDM, including call centers (but those have not changed traffic volumes).
- All: Rebound in Cheyenne; university workers still down and may "stick" post-COVID with work-from-home and telecommute percent (Missoula).
- Missoula: Came up with Missoula in Motion, a permanent telework policy; emphasizes telework more as an option and is now part of the conversation.
- BTPO: Borrow from TDM practices in larger areas.
- Cheyenne: No one really knows how much the current emphasis on work-from-home is going to settle in for the long term; we are using sampled cell phone data platforms to understand that trend.
- BTPO: The smaller the organization the harder it is to switch/understand the transition to virtual and online methods, and it is pretty expensive to apply.
- Cheyenne: The state is going to hurt from the decline in mineral royalties (e.g., oil) and may stop getting some state allocations.
- Missoula: Montana is also struggling.
- Cheyenne: Fortunate in that there are only two MPOs in the state for PL104 and transit apportionment; may reduce the number of employees in the coming year with $850,000 annually; implementation of plans is hard because local governments do not have the dollars to build many of the planned projects albeit without frills.
- BTPO: Depends on what state you are in for state allocations and where you are at, including with project funding.
- BTPO: Biggest challenge is keeping pace with requirements and new tools; being in non-attainment forces a four-year MTP cycle.
- BTPO: Finding a scope of work for things that the MPO wants to take on can be challenging.
- Missoula: Less control over funding like the TMAs; prior to the FAST Act there was more flexibility in terms of direct suballocations; now it is very competitive, and there is less local control over selection and implementation.
- Missoula: The TMA/larger MPO can direct program dollars; the veto authority is crude and not as useful as direct programming; still struggling to get through to subsequent phases of one project that has been going on for 30 years; somewhat at the mercy of the state DOT, so if they do not buy into MPO priorities it is problematic for getting things done.
- BTPO: Suballocation to urban/rural areas that had to figure out suballocation; new TMA sharply reduced the amount of funding for other MPOs because of federal requirements for direct allocation to TMAs.
- Cheyenne: Wyoming keeps CMAQ dollars for the state.
- Staff: Trouble with experienced staff attraction (wage rates) but lots of candidates with low levels of experience; higher housing costs also make it a tough sell (Missoula); county office is useful for training then move on to Colorado for higher-paying jobs but fortunate to keep good staff.
- Missoula: Some of the changes (e.g., CAVs) are not an immediate concern, so incorporation into the planning process has not been a concern that the regular plan update process (every four years) cannot accommodate.
- Missoula: The MPO staff cross-pollinates work with the city itself and that helps create an ability to identify needs and allocate resources through the city; manages infrastructure and transportation planning.
- BTPO: The four-year cycle is perhaps too frequent because there is not enough time to work on the ideas coming out of a plan – the community is getting weary; smaller MPOs would be more effective if they were not constantly undergoing plan updates.
- Cheyenne: Award-winning PlanCheyenne had a comprehensive plan, then took longer to get the subsequent plan approved, then was late on the follow-up plan with the feds, forcing an interim transportation plan.
- Cheyenne: When an area starts to grow then a minimum five-year window is important.

Since MPOs are principally a policy board composed largely of local governments without much day-to-day authority to implement projects, describe how your MPO has worked to make itself more effective, practical, and relevant to local and state agencies.

- Cheyenne: One city/one county with good participation from both entities, although staff representation can change frequently; directly involved with city/county development actions (reviews of site plans, annexations, etc.) for access control and other regulatory compliance; active with city/county staff on projects (steering committees, consultant selection); taken over pavement management programs for city/county because of key staff (re-)hire; pay for some elements of the transit program including an update of the TDP
- BTPO: (1) until 10 years ago the MPO had dollars/tech to do studies that the cities did not have (e.g., street centerline file) but has decreased so now MOU for traffic operations and implementation on state highways; (2) new MPOs/TMAs may decrease 30% to 40% of funds that will have to be made up with local funds
- Missoula: The MPO works hard to be present at many meetings with other agencies; again, relevancy is improved by being integrated with the city of Missoula; contribute PL104 funds to support transportation input to master/area plans; struggle to integrate land use and transportation planning and how to actuate those with more questions coming up more often

Is there a private partnership or collaboration that you value today, or is there one (or more) that ideally will happen in the future for your MPO to be even more effective and efficient?

- BTPO: Tasked with inventorying the pedestrian facilities since 2006, which has proven to be nearly impossible, so they partnered with local universities and produced one database for use with all agencies and has worked so well they are considering other collaborations (e.g., sign inventory)
- Cheyenne: The MPO helped get the city and county started in GIS but eventually moved to the background as those entities acquired their own capabilities; GIS policy committee/executive committee has formed (Laramie County GIS cooperative)
- Cheyenne: Cheyenne LEADS, Visit Cheyenne, and Chamber work closely together to drive priorities forward and have worked with them on projects down through the years to achieve common goals (e.g., wayfinding sign system was put out to bid and managed by MPO)
- Cheyenne: Air Force base will be modernizing nuclear missiles starting in Cheyenne and will help them out (will add to growth and transportation needs)
- Missoula: Neighborhood organization partnerships and working with traffic management program focusing on local streets (speeding) and using that focus on neighborhood greenways/bike boulevards, traffic circles ($1000 or less treatment), placemaking traffic calming (murals added to public space, open street events)—tying all of this back to transportation projects and priorities and empower them.

Talk about a project, process, or partnership (not already discussed) that you are particularly proud of and why. It could also be something you are looking forward to starting or is just underway now.

- Cheyenne: Neighborhood traffic safety plan and process for neighborhoods that come to them with concerns about speeding traffic, and they analyze and find appropriate solutions as needed.
- Cheyenne: Active in developing greenways (40 miles) with the concern being maintenance; now neighborhoods and developers are building out the system at their own cost; Reed Rail Corridor is an industrial corridor to be converted into a pedestrian/bicycle redevelopment area (restaurants, bars, etc.); Union Pacific Depot provided them with STP funds going from threat of being demolished to a keystone of success in downtown.

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Key Takeaways

- MPOs are engaging in a wide variety of partnerships outside of their traditional FHWA/DOT and member agency partners. They are working with developers, neighborhood groups, chambers of commerce, and transit agencies. One-off or limited projects are a good way to incrementally build capacity.
- The pandemic-induced shift to online engagement was difficult for smaller MPOs. They lacked the capacity to respond. Being able to engage through social media was suddenly critical. Online meetings have raised the issue of the digital divide, and it remains difficult to have ad hoc one-on-one conversations.
- The long-term effects of the pandemic on travel behavior create great uncertainty regarding future travel demands.
- Local matching for federal funding is becoming a limitation; both being able to find the match, and the match requirements for federal aid projects are drowning out local projects.
- The increasing number of MPOs and TMAs is splitting the share of available funding at the same time that the FAST Act unfunded mandates are requiring more of MPOs. Some MPOs were already having trouble completing a four-year plan on a regular cycle.

Summary of Regional Roundtable: Washington, DC–Maryland–Virginia

February 25, 2021
1:00 pm–2:30 pm EST

Attendees

Samuel S. Belfield, Senior Transportation Engineer, Hampton Roads Transportation Planning Organization (HRTPO)
Robert B. Case, PE, PhD, Chief Transportation Engineer, HRTPO
Pavithra Parthasarathi, Deputy Executive Director, HRTPO
Andrew Meese, Systems Performance Planning Program Director, Metropolitan Washington Council of Governments (MWCOG)
Kanathur Srikanth, Deputy Executive Director Metropolitan Planning, MWCOG
Bala Akundi, Principal Transportation Engineer, Baltimore Metropolitan Council (BMC)
Don Halligan, Senior Transportation Planner, BMC

Summary of Discussion Topics

MPOs are very partnership- and collaboration-oriented. Describe a recent experience where such a partnership worked or one that did not work out as well as hoped and why?

- MWCOG: Partnerships work sometimes and sometimes not; not having direct authority has emphasized the importance of partnering. There are two perspectives: regional and own member agencies. Regional transportation authorities have funding authority but are not MPO members (their member governments are often MPO members). A lot of time is spent on policies and principles when there are 27 decision-makers to agree on a single project or program. It is necessary to allow a lot of flexibility to carry those actions out. Examples: (1) After 9/11, cross-jurisdictional security issues emerged then created a new entity for three state DOTs, transit operators, Homeland Security, and others that are staffed and some funding by the MPO; and (2) Implementing STP set-aside in arrangement with three state DOTs to address multi-state region. Partnerships in core activities often involve growing an action in one direction or another, which requires reaching out during an operational (not planning) time frame.

- HRTPO: Established military transportation needs: (1) highway network analysis for military-used roads, (2) military community survey useful for outreach and input, and (3) sea-level rise-related issues that might impact the military. (Part of TRB committee on military affairs.) Other partnerships are with VDOT, ports, etc. to deliver for clients; clients/customers are local governments. Partner with StreetLight Data, Inc. (informal, private sector) accessed through a contract with VDOT. Citizens committees (e.g., bicycles that cover a portion of the region) that may request studies; rail/public transportation are members but also partners. Biggest channel for partnership is through data distribution via studies that others can use to implement strategies and recommendations.
- BMC: The Maryland Highway Safety Office is producing highway safety plans and is the recipient of a significant amount of funding ($300k–$400k) that funds a full-time coordinator position developing local safety plans (four completed, three more about to begin). It may be easier or less threatening for the MPO to coordinate meetings than other parties. Also, local governments, the disabled community, worked on a grant application with the state but developed a partnership that can work in the future for other opportunities. These actions help break down silos and address challenging issues like social equity. BMC received a HUD sustainability grant which in part dealt with transportation but also workforce housing that produced significant results for the region and attracted a lot of positive attention and credit. This still serves as a way of coordinating housing groups that are ongoing. Some advocacy organizations have attempted to work with an MPO to gain an advantage over other entities.

Tectonic shifts are happening nationally and globally in demographics, technology, and communication. How are these changes impacting your organization, or have they impacted it?

- The pandemic is a totally separate category from technology, which is not new at all; the pandemic has had some sweeping impacts on land use, work patterns, etc. Climate change and resiliency are a challenge to the MPO to understand the role and what they can do about it. AVs and planning for them are concerns, especially how they impact land use and demand for travel, including impacts on transit and transit revenues. But the MPO is being asked about this topic because they look out 20 years, and the plans may be viewed as too backward-looking. MaaS is also impacting traditional transportation infrastructure plans and impacts from the recommendations (e.g., emissions) and producing a false sense of accuracy. The pace of change is very difficult, but we do have access to data that we never had before, too. One answer that could be done more often is scenario planning and applying a range of outcomes. Micromobility has been a big topic in part because it happened so quickly. The 21st century will focus on curbside management and competition for its space (freight, MaaS, parking, etc.).
- Got lucky with scenario planning because it was enacted through a different program that otherwise could not have been afforded. Technology has given us access to data and information resources that they couldn't have dreamed of previously.
- BMC: Should be looked at as an opportunity, not just a challenge since MPOs can provide resources and talents to their clients through forums (formal and informal).
- Some MPOs in Florida are creating their own ITS master plans.
- With COVID-19 and communications technology: when it goes well it is great and can facilitate stakeholder involvement across a big region or state; however, when it goes badly it can earn a lot of enemies. Other technologies are now built into new cars: auto braking, lane assist, blind-spot alerts, backing alerts, etc., which will have tremendous value for safety. Could evolve into smaller headway spacing and increases in roadway capacity.
- BMC: Technology has had an impact on social justice and equity issues, increased training on racism for boards and staff. Social equity issues are now coming up much more often than before and are not as siloed.

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A dark horse subject arose during the 2020 survey our project did with 129 MPOs and that was the topic of attracting, retaining, and training MPO staff. MPOs may have some interesting challenges in this regard; do you have insights into getting and keeping great staff?

- MWCOG: At the agency, about 50 people are MPO staff, a number of whom have stayed there for 40 years; the average may be around 20 years, although turnover is about 10% per year for other staff. Not focusing on state or city boundaries can make it difficult to focus on a region and varying perspectives that require a long time to resolve issues. The MPO doesn't always lead or have primary authority over specific plans or projects, which can be frustrating to work with many people and viewpoints. With every transportation bill reauthorization, there is more put on MPOs without more resources or authority; this creates uncertainty where some people do not thrive.
- No one wants to start off being at an MPO but falls into it; state DOTs, city DOTs, transit agencies all go through this problem – there is no central or organized place to seek MPO talent.
- HRTPO: There is a large disparity in how MPOs handle their business; staff sizes vary—there is not a correspondence between staffing and population.
- HRTPO: Federal requirements keep being thrown at the TPO without more resources; roles evolve and change between staff. There are so many issues and things going on, making it difficult to maintain a relevant skill set. Some MPOs use a lot of consultants that allow them to use specialized staff, but there is no ability in-house to update the original well-done report. Give people ownership for the work that they have done; opportunities for advancement are somewhat limited by not getting raises if that is determined by the policy board. We hired one person on a student visa, and it worked well until the visa ran out, and we have been unable to renew the visa so far. Some people may be better at making hiring decisions than others.
- MWCOG: Part of the COG so personnel things are exactly MPO things. Competitiveness studies are conducted independently to determine the validity of salaries and classifications. Turnover is not fast, and the organization is not large. Somewhat depends on what type of position is being advertised as to how many applications are received.
- HRTPO: Generational shifts are important, too, since perspectives on what is important are not always common.
- The lesson of the pandemic and telework: are the options going to be expanding and continuing to utilize remote working? Different agencies, of which the MPOs are a part, may take different stances and could be one more barrier if telework is not allowed.
- Hard to compare salaries with MPO positions because its staffing needs and talents can be quite different from other types of agencies where the salary comparisons are being drawn.
- MPOs can be attractive for consultants that want to limit travel and life-work balances. Benefits and other factors can be reasons that people leave.

The foundation for MPO planning is the 20-year metropolitan transportation plan (MTP, RTP, or LRTP). Some of the changes we just discussed are very fast-evolving – weigh in on the relevance of the 20-year plan and planning process, and how it could be made more effective.

- The 20-year plan adds value but building in some degree of recognition that there is a problem gaining certainty and forecasting transportation and transit conditions 20 years in the future is important. Right now, presenting a 20-year plan creates a false sense of accuracy for volumes of future travel and funding. More flexibility would be one desirable regulation change; identify climate change responsibilities of MPOs more specifically.
- Surveys across the country show that MPOs agreed that the long-range plan is very much supported and keeps MPOs very relevant, especially since there is no specific project authority otherwise. A lot of pushback on lengthening plans to 10-year cycles (e.g., California).

Some things noticed about your MPOs include freight involvement and a focus on sea-level rise/climate change/resiliency (HRTPO); a robust Transportation System Management program (BMC); and a sophisticated congestion management dashboard and a focus on security issues (MWCOG). Please comment on any of these as you see fit.

- BMC: TSM history was that we were hired to work on an ITS early deployment plan and once complete started to look at traffic incident management being led by the state for a region. We did modeling for the incident management committee after that. MWCOG had a traffic signal committee that was also adopted by BMC. Urban area security initiative prompted a committee started in the mid-2000s that addresses public works and is under the Homeland Security workgroup. Disaster planning has its own committee to address that issue. Would like to see an investment in data provided to the MPO so that they are not constantly working to find data to help in the planning process.
- HRTPO: Sea-level rise is not a core issue for MPOs generally but is a major topic for HRTPO. Looking at flooding impacts as they relate to the environment and impact transportation infrastructure—these are not separate issues but should be considered together with a few people having experience in both areas. About half of MPO staff are engineers and half are planners, which is a rarity in MPO staffing.

Key Findings

Partnerships

- Effective operation as an MPO requires developing relationships over time with board members. Establishing policy principles, while time-consuming and drawn out, helps set the stage for later project selection.
- Over time, the remit of MPOs tends to grow into areas unrelated to their core competency of transportation planning and into a variety of related regional issues. This is partially a function of MPOs becoming the natural convener, coordinating agency, and default regional talk shop, and partially because many MPOs become the default home of data and analytical capacity. Outsourcing can happen from both member jurisdictions (cities and towns), but also to get help administering and implementing certain classes of projects for the DOT. Other examples of DOT/MPO collaboration include a Strategic Highway Safety Plan, and MPO/local district coordination on local plans, resulting in a DOT-funded position within the MPO. MPOs may also be asked by their members to more deeply explore certain topics or issues, including acting as a sort of general consultant, treating members as clients, and also by hosting committees on topics of interest. Committees cannot always do things but do seem important in being able to draw attention to things and to incubate things. Ad hoc/ex officio committees deal with issues of regional concern—not because they cross regional boundaries, but because the concerns are common to all MPO members across the region.
- In this way, MPOs' coordination efforts can cover not only transboundary issues but also issues common to many of their members. MPOs are uniquely capable of acting at a neutral table as a convener and can be seen as less threatening than the state doing so, as there is no implied command or control.
- The convening function of MPOs plays into their capacity to bring previously unrelated organizations into contact and work on common projects, including partners such as HUD, a local port, the USDA, local disability community organizations, and local transit organizations. Doing so requires moving beyond one person doing the outreach. These partnerships help build both the credibility and capacity of MPOs. Not all partnerships are viable – state attempts to leverage MPO capacity can run contrary to MPO obligations.

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- Money (in the form of grant funding or potential grant funding) often motivates new partnerships, and many MPO partners are created and sustained by non-formula funding. Funding drives a lot of innovation; MPOs understand how to apply for funding.
- Partnerships also enable organizational learning, enabling learning through imitation. MPOs can copy COG innovations or innovations from state jurisdictions (DOT districts, planning organizations).

Staffing

- Many MPOs struggle to both attract and maintain staff. While long-term staff are not uncommon, sustained turnover is to be expected.
- Finding staff for MPOs is difficult because of the combination of specialization and generalization – the job is not generic and requires a variety of skills, among them the capacity to wear many hats. Being an MPO planner requires staff to think in ways that transcend jurisdictional boundaries as well as being comfortable dealing with multiple perspectives over a multi-year time span. Paraphrasing one panelist, 'You're going to find that somebody who has both the technical knowledge and a knowledge of how to take planning ideas and the passion to work with multiple, diverse viewpoints to make it happen.'
- MPOs staff have many origins—there is no consistent career path, and over time most MPO staff shift responsibilities once within an organization. The regional nature of MPOs means that there is little MPO to MPO staff movement.
- With every reauthorization, there is more being put on MPO plates, resulting in increasing MPOs' responsibilities with stagnant resources, trying to meet the demands of its board while still complying with a long list of federal obligations.
- There is no relationship between the size of the region and the size of MPO staff; different places make different amounts of use of consultants. MPOs with larger staff seem to act more as consultants for the regions, becoming engaged in on-the-ground types of studies: corridor studies, citywide studies, and bike and pedestrian studies.
- Maintaining a skill set in a specialty is a challenge, and many MPOs rely on consultants with specialized training, but doing so sabotages an MPO's capacity to expand/improve on that work.
- For small MPOs, the inability to promote staff from within is a challenge. Maintaining competitive rates of pay can be difficult; comparative analysis of salaries can help, but the MPO planning skill set can be difficult to compare because of the 'many hats' issue. Regardless of geography, retaining staff is difficult, and hiring is an ongoing process—having staff that are good at hiring is valuable. The growing acceptance of remote work offers access to a larger labor pool; pandemic has demonstrated feasibility.

Technology

- Things are changing—shifts are not tectonic, but rather the world is changing more rapidly than anticipated. Changes that were on the horizon are suddenly here. The changes seem dramatic, but there is still a high level of uncertainty on whether the changed conditions are permanent or ongoing. The most alarming changes MPOs face are those for which new and innovative technology affects underlying assumptions about how transportation operates, making the future very difficult to predict. Yet because the MPO is the only agency with any experience dealing with long-range planning (and hence long-range forecasting) and because of the need for precision in estimates for long-range air quality compliance, the modeled forecasts imply a degree of accuracy that is spurious based on the numerous assumptions of future-year conditions.
- Designed to deal with uncertainty and complexity, what the future *might* be like, scenario planning is suggested as a best practice to gain estimates of what ranges of outcomes are

possible/likely. Scenario planning also allows MPOs to explore different paradigms (i.e., apart from expanding mainline road capacity). Scenario planning is perhaps seen as a luxury and is used in the sense of regional visioning or multiple future land use and transportation planning alternatives rather than the range of values for outcomes under different numerical assumptions.
- On the flip side, novel data makes novel analysis possible; INRIX and StreetLight offer mind-blowing accuracy about information that previously had to be assumed.
- Video-conferencing (Zoom Teams, etc.) makes stakeholder engagement much easier, reducing the need for travel and making collaboration (more meetings) easier to achieve, really improving the connectivity of the core and periphery.

Relevancy of the 20-Year Plan

- To present a 20-year plan with the required degree of specificity, even if they are all assumptions, is a challenge, especially in light of all the uncertainties about technology and demand for travel and the revenue that accompanies it, making it difficult to predict revenues 20 years into the future. One best practice may simply be to treat a given 20-year plan as a potential future scenario.
- Despite difficulties, the 20-year plan remains a foundational document in MPO practice because it is the only governing document (thanks to air quality compliance) that some MPOs produce.

Summary of Regional Roundtable: Connecticut

March 5, 2021
3:00 pm–4:45 pm EST

Attendees

Sam Gold, Executive Director, Lower Connecticut River Valley Council of Governments (LCRVCOG)
Robert Haramut, Planning Director, LCRVCOG
Robert Aloise, Director of Planning, Capitol Region Council of Governments (CRCOG)
Jennifer Carrier, Transportation Planner, FHWA Connecticut Division
Maribeth Wojenski, Bureau Chief, Connecticut Department of Transportation (CTDOT)
Kathryn Faraci, CTDOT
Lisa Rivers, Transit Manager, CTDOT
Howard Glassman, Senior Planning Consultant, Gannett Fleming, Inc.
Wade Carroll, Project Manager, Metro Analytics, PLLC
Scott Lane, Principal Investigator, Metro Analytics, PLLC

Part I: Best Practices, Challenges, Opportunities in 3C Planning Process

Part I of the Regional Roundtable began with an overview of the MPOs' 3C (continuing, cooperative, and comprehensive) planning process and focused on four discussion questions provided prior to the Regional Roundtable discussion.

Overview of the 3C Planning Process

- The MPO directors provided a brief overview of their 3C planning process. All MPOs in Connecticut are hosted by Councils of Government (COG). The Capitol Region Council

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of Governments, Connecticut's largest regional planning organization, is the MPO serving Hartford and 37 surrounding communities. The Lower Connecticut River Valley Council of Governments is the MPO serving 17 towns in Southcentral Connecticut. Regarding "Continuing," the directors noted that long-term staff employment builds relationships and allows for the transfer of MPO work activities from one director to the next. Regarding "Comprehensive," the fact that all Connecticut MPOs are hosted by a separate COG inherently results in MPOs being involved and connected with land use, economic, agricultural, and other planning disciplines.

- Uniquely, Connecticut MPOs are the host agency for Emergency Planning and Homeland Security Planning and are directly involved in the development of Natural Hazard Mitigation Plans. Regarding "Cooperative," all MPOs in Connecticut share their Transportation Management Areas (TMAs) so that all MPOs must work together.
- The CTDOT owns and operates most of the bus companies in the state.
- Monthly statewide MPO meetings help to address issues of concern and promote cooperative planning through the Connecticut Association of Councils of Governments, which is currently chaired by an MPO executive director.

Question 1: How can MPOs and their agency partners be poised and equipped to better address current and future opportunities and challenges (pandemics, market disruptions, or other unexpected events)?

- The CRCOG and LCRVCOG felt that they are situated in a way that allows them to be able to transition to address changing or unexpected events such as pandemics. Through virtual meetings and a strong state DOT, they are positioned to address issues as they arise.
- The CTDOT took the lead in National Performance Management Measures and developed the performance targets that are to be used by the state and MPOs. The MPOs' relationship with COGs enables them to address emerging issues through the COG board or through other governmental agencies that are involved in nontraditional transportation issues. This allows Connecticut MPOs to "break down the silos" that often separate MPOs from other non-transportation-related organizations.
- It was also noted that MPOs do not all have the same staff capabilities and resources. The MPOs that are well staffed and funded have a greater potential to accept change and the ability to transition to new and emerging issues. For example, if local officials serving on an MPO board are unwilling to commit a full 10% funding match toward federal transportation planning (PL) funds it affects the efficacy of that MPO to implement the 3C planning process. The CTDOT contributes up to a 10% match of the PL funding, but local MPO officials must also step up and provide the other 10% match with non-federal funds. MPO funding and efficacy are also impacted by the willingness of a COG to impose a per capita fee upon each of its local members. The LCRVCOG, for example, imposes a $1.20 per capita fee upon each of its member governments.
- The CTDOT serves as a non-voting member of the MPOs, which provides the agency added flexibility in how they participate in the MPO planning process to address new and emerging MPO issues.

Question 2: What strategies can be used to improve the efficacy of MPOs and their agency partners in implementing the 3C planning process?

- Several strategies were identified by the participants during the roundtable discussion. Currently, the CTDOT and MPOs are moving forward with the sharing of websites, sharing information regarding the State Work Program and the Transportation Improvement Programs, and getting joint access to data. A forum partnership exists between Connecticut MPOs and MPOs surrounding New York City. This strategy is being used to address freight planning throughout a megaregion that encompasses multiple states and numerous MPOs.

- Funding strategies were also discussed by Regional Roundtable attendees. It was noted that Connecticut MPOs typically allocate urbanized-area federal funds to smaller state assets, while CTDOT-controlled federal funds are allocated to larger state assets such as National Highway System (NHS) projects. State bond funds are allocated by MPOs to local transportation projects that generally are not on the NHS or the state highway system.
- Informal strategies, such as informal meetings between MPO staff and agency staff are commonly used between MPOs and the CTDOT. An agreement between MPOs and their agency partners is an example of a formal strategy to connect MPOs and their agency partners. It was noted that some agreements need to be updated, which was a finding during the MPO certification reviews. The ability to drive just a few hours between the central office of the CTDOT and each MPO is conducive to having informal meetings.

Question 3: Should the roles, responsibilities, and resources of MPOs change in relation to their state, regional, and local transportation partners?

- The attendees agreed on the roles and responsibilities of MPOs, CTDOT, transit agencies, and their federal partners are generally working well and are not in need of major changes.
- One issue of concern to the MPOs is the use of indirect rates that MPOs must use to receive federal planning funds. The indirect rates that are required by FHWA, FTA, or both are not consistent with those used by other federal agencies, making it difficult to secure other federal funds. Applying state-established indirect rates may be a better way to allow MPOs to work more efficiently with other federal agencies. Specifically, 2 CFR 200.331(a)(4) requires that every subaward of federal funds from the pass-through entity (i.e., state DOT) to the subrecipient must include, among other elements, an indirect cost rate.

Question 4: What are some noteworthy best practices in the 3C planning process that could be replicated (or not) by other MPOs?

- All MPOs in Connecticut are on the same update/adoption schedule for the development of Long-Range Transportation Plans (LRTPs), Transportation Improvement Programs (TIPs), Unified Planning Work Programs (UPWPs), and the State Transportation Improvement Program (STIP).
- CTDOT has developed an MPO program handbook that is used by the CTDOT and the MPOs.
- The CTDOT Transit Office is reviewing proposed transit study projects early in the project development process to be sure that the study objectives and costs associated with the study align with department policies and practices.
- All MPOs in Connecticut participate in Natural Hazard Mitigation Planning as well as Homeland Security Planning.
- CTDOT is actively engaged in reviewing all aspects of proposed corridor studies to be sure that corridor study funds are being applied to those studies that clearly demonstrate a purpose and need.
- A mid-term informal MPO certification review takes place with each MPO following their official MPO certification review. This mid-term informal review includes the participation of the MPO, CTDOT, and the FHWA Division Office.

Part II of the Regional Roundtable Discussion Pertained to Identifying and Addressing Major Policy Topics Confronting MPOs and Their Agency Partners

In advance of this Regional Roundtable, the MPOs and their agency partners submitted an assortment of major topics for discussion.

- There is just not enough funding to address the need, and state DOTs are slowly but surely determining more and more how the existing funding is spent. Our MPO members (local

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governments, etc.) realize this, and they are becoming less and less willing to participate in the MPO process.
- The roundtable attendees recognized the importance of keeping the MPO process relevant for both the public and each MPO member. MPO connectivity to COGs is important because it connects transportation planning to other planning disciplines that are often the responsibility of COGs. MPO staff lunches with recently appointed MPO board members provide an opportunity to explain the MPO process and help new members to be successful.
- The shortage of MPO funds requires MPOs to seek creative solutions, such as per capita fees from municipal government MPO members. The participants also noted that the increasingly growing costs of large transportation projects present a challenge to each MPO. New transportation dollars are needed to fix 1960s infrastructure.
- Federal requirements and emerging issues—both continue to increase, making it more and more difficult for MPOs to function effectively. MPOs feel they are being spread too thin.
- The roundtable attendees noted that MPOs need increased access to data sources so that they can manage and use the data in their MPO area. Having states buy data sets and making them available to MPOs would greatly assist MPOs in their development of transportation plans and programs. The University of Connecticut's UCONN Crash Data Repository is an example of a valuable data set that MPOs can access.

Summary of Key Findings

The MPO directors provided a brief overview of their 3C planning process. All MPOs in Connecticut are hosted by Councils of Government (COG). The Capitol Region Council of Governments, Connecticut's largest regional planning organization, is the MPO serving Hartford and 37 surrounding communities. The Lower Connecticut River Valley Council of Governments is the MPO serving 17 towns in Southcentral Connecticut. Regarding "Continuing," the directors noted that long-term staff employment builds relationships and allows for the transfer of MPO work activities from one director to the next. Regarding "Comprehensive" the fact that all Connecticut MPOs are hosted by a separate COG inherently results in MPOs being involved and connected with land use, economic, agricultural, and other planning disciplines. Uniquely, Connecticut MPOs are the host agency for Emergency Planning and Homeland Security Planning and directly are involved in the development of Natural Hazard Mitigation Plans. Regarding "Cooperative" all MPOs in Connecticut share their Transportation Management Areas (TMAs) so that all MPOs must work together. The CTDOT owns and operates most of the bus companies in the state. Monthly statewide MPO meetings help to address issues of concern and promote cooperative planning through the Connecticut Association of Councils of Governments, which is currently chaired by an MPO executive director.

The Connecticut area Regional Roundtable discussion was attended by representatives from MPOs, the CTDOT, and federal agencies. It resulted in the following key findings.

- All MPOs in the state of Connecticut are hosted by a council of government. This provides MPOs with the ability to be actively involved in transportation issues as well as other issues that relate to transportation but are not considered core MPO planning requirements.
- Connecticut MPOs are the host agency for Emergency Planning and Homeland Security Planning and are directly involved in the development of Natural Hazard Mitigation Plans and Homeland Security Plans.
- Councils of Government and their MPOs have established the Connecticut Association of Councils of Governments, which provides MPOs and their agency partners a forum to discuss and advance the 3C planning process.
- COGs and MPOs utilize federal transportation funds as well as per capita member fees to address the costs associated with running an MPO and fulfilling the many federal and state planning requirements.

- Sharing data assets, websites, and information related to the development of Transportation Improvement Programs (TIPs) and the State Transportation Improvement Program (STIP) is being advanced in Connecticut to reduce costs and enhance the 3C transportation planning process.
- Indirect rates that MPOs use to receive FHWA and FTA funds are not always recognized by other federal agencies. Applying state-approved indirect rates may be a more effective approach for MPOs seeking funds from other federal agencies.
- All MPOs and the CTDOT are on the same update/adoption schedule for the development of MPO Long-Range Transportation Plans (LRTPs), Transportation Improvement Programs (TIPs), Unified Planning Work Programs (UPWPs), and the State Transportation Improvement Program (STIP).
- A mid-term informal MPO certification review takes place with each MPO following their official MPO certification review. This mid-term informal review includes the participation of the MPO, CTDOT, and the FHWA Division Office.
- The roles and responsibilities between MPOs and their agency partners are generally working well and are not in need of major changes.

Summary of Regional Roundtable: New York State

March 12, 2021
3:00 pm–4:45 pm EST

Attendees

Michael Franchini, Executive Director, Capital District Transportation Committee
Hal Morse, Executive Director, Greater Buffalo-Niagara Regional Transportation Council
Lynn Weiskopf, Director, Office of Policy, Planning & Performance, New York State Department of Transportation (NYSDOT)
David Rettig, Director, Office of Regional Planning & Program Coordination, NYSDOT
Maria Chau, Senior Community Planner, FHWA New York State Division
Donald Burns, Director of Planning & Program Development, Federal Transit Administration (FTA) Region II
Carm Basile, CEO, Capital District Transportation Authority
Howard Glassman, Senior Planning Consultant, Gannett Fleming, Inc.
Wade Carroll, Project Manager, Metro Analytics, PLLC
Scott Lane, Principal Investigator, Metro Analytics, PLLC

Part I: Best Practices, Challenges, Opportunities in 3C Planning Process

Part I of the Regional Roundtable began with an overview of each MPO's (continuing, cooperative, and comprehensive) planning process and focused on four discussion questions provided prior to the Regional Roundtable discussion.

Overview of the 3C Planning Process

- The MPO directors provided a brief overview of their 3C planning process. The Capital District Transportation Committee is the designated MPO for the Albany-Schenectady-Troy and Sarasota Springs metropolitan area. The Greater Buffalo-Niagara Regional Transportation Council is the MPO for Erie and Niagara Counties. The directors noted the diversity of the urban and rural geographic areas that are within their MPO boundaries and the importance of being able to address urban and rural issues as well as varying urban size and complexities.

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- Regional strategic partnerships are an important element of the cooperative planning process. They have long-established working relationships and coordination efforts with the various modes of transportation, including close cooperation with Transportation Management Centers for live traffic management and dynamic simulation. The importance of expediting the delivery of transportation projects resulted in a project delivery workshop that was jointly hosted by the Capital District Transportation Committee and the Capital District Transportation Authority.
- The MPO directors emphasized that active cooperation with MPO members (cities, transit agencies, etc.) is essential to the success of the 3C planning process. This means working directly with MPO members to understand their community's transportation needs and project priorities. It then becomes the responsibility of an MPO to develop a Transportation Improvement Program that balances those needs without bias toward highway, transit, or another mode of transportation. The directors also discussed the "regional strategic partnerships" they have initiated with both traditional and nontraditional transportation partners. Both MPOs that participated in the roundtable discussion are hosted by a regional transportation authority.

Question 1: How can MPOs and their agency partners be poised and equipped to better address current and future opportunities and challenges (pandemics, market disruptions, or other unexpected events)?

- MPOs and their agency partners expressed the importance of making MPOs "mobility managers" that have the capacity to provide a deep menu of transportation choices, including fixed-route service, Bus Rapid Transit (BRT), regional bikesharing, and other modal choices. As noted by an attendee, "Gone are days when transit agencies can simply provide 40 ft buses to satisfy the demand for public transportation."
- To be poised and equipped to address the future, the MPOs and their agency partners explained the importance of incorporating Transportation System Management & Operations (TSM&O) into the 3C planning process. The NYSDOT provides a starting point for this initiative by connecting their work on TSM&O, active transportation, and demand management programs and by creating a pathway for MPOs to join them in this effort.
- A common theme heard during the roundtable discussion was the need to cultivate relationships with both traditional as well as nontraditional partners in order to be poised for the future. This is necessary to address the expanding list of issues that confront MPOs and their elected officials including climate change and alternative energies. For example, the Capital Region Transportation Committee is reaching out to school districts and their bicycle clubs to better understand their issues and needs. Likewise, they are also exploring new academic research partnerships and have entered into contracts with the University of Albany for data collection and Rensselaer Polytechnic Institute (RPI) for freight-related activities. The Greater Buffalo-Niagara Regional Transportation Council is involved in risk and market share analysis and has contracted a smart mobility advisor to ensure they are contemporary in their thinking and planning practices.

Question 2: What strategies can be used to improve the efficacy of MPOs and their agency partners in implementing the 3C planning process?

- The pandemic has challenged MPOs to find ways to achieve a meeting quorum. They have found that virtual meetings provide a communication strategy useful during unexpected events because they can be set up quickly and are able to comply with state and local meeting requirements.
- The New York State Association of MPOs (NYSAMPO) provides a meeting forum for MPOs to interact and learn from other MPOs. It is mutually beneficial for the MPO members and the participating state and federal agencies. The NYSAMPO maintains nine working groups to address a variety of issues such as equity and safety. The association provides a means for

FTA to communicate effectively with New York's MPOs when they are unable to attend in person. Following each NYSAMPO meeting, FTA is given questions asked by the members, and they are able to respond to those questions in a timely and cost-effective way.

- The decentralized structure of the NYSDOT consists of 11 regional offices that are supported by a central office headquarters. The regional offices provide direct contact to the MPOs, which is supported by liaisons from the Statewide NYSDOT office. The NYSDOT region serves as a voting member on each MPO and has assisted the MPOs by sharing planning data for bicycles and other transportation modes.
- The attendees stressed the importance of informal working relationships between the MPOs and their agency partners. Informal discussions between staff early on during the development of the MPO Transportation Improvement Program (TIP) and the department's State Transportation Improvement Program (STIP) improve the planning process and timeliness of project delivery. It was also noted that with fewer staff members now working for MPOs and their agency partners, more than ever there is a need to be efficient, stay focused on the issues, and get things done.
- Similarly, there is a need for the agencies to be flexible and offer creative solutions that can move projects forward through the project development process. This includes keeping MPOs fully apprised of the status of all pending projects. Many projects take years to advance through the phases of project development. Projects will be managed by new project managers and subject to changing agency guidelines and objectives. The attendees agreed that each contributor in the 3C process, including MPO board members, the public, and local project sponsors, needs to understand the project development process.

Question 3: Should the roles, responsibilities, and resources of MPOs change in relation to their state, regional, and local transportation partners?

- In general, the attendees did not feel there was a need for significant changes to the 3C planning process. The MPOs are proud of the process they created for their metropolitan areas and do not see a need for a major shift in the roles and responsibilities of the MPOs or their agency partners. When it came to the question of who should be the recipient of transportation project funds, the attendees felt the real issue is that there simply are not enough transportation dollars to address the MPOs' unfunded needs.
- The role of MPOs has significantly grown over the years and they are now involved in many issues at a much deeper level than ever before. For example, safety planning is a data-driven activity that requires MPOs to have specific knowledge and skills to effectively interact with other members of the safety community. It means that MPO staffs need to be equipped with new expertise, communication, and organizational skills to effectively participate in the 3C planning process.
- The delivery of transportation projects is often considered a state or local agency responsibility that is outside the purview of MPOs. The Regional Roundtable attendees believe that reality is changing as transit operators and MPOs are now using economic stimulus funds that are expected to be deployed quickly through the planning and project development process. For many MPOs, this may be a new role in helping to shorten the timeline between transportation planning, programming, and production. The move from plan to action requires cooperation among the MPOs and agency partners in the 3C planning process.

Question 4: What are some noteworthy best practices in the 3C planning process that could be replicated (or not) by other MPOs?

- Advisory committees provide an important organizational level within the MPO structure. Advisory committees for equity, freight, operations, and safety focus on important policy and planning issues that expand the skills and capabilities of MPOs. The Capital Region

Transportation Committee and the Greater Buffalo-Niagara Regional Transportation Council have advisory committees that work with many nontraditional transportation partners that previously had a less pronounced role in working with MPOs.

- NYSAMPO provides a forum for discussion between MPOs and their agency partners that should be replicated throughout the nation. It provides for the sharing of information and a platform to learn the activities of other organizations, including FHWA and FTA. The association has a long history of conducting applied research studies to the benefit of the MPOs and the planning profession.
- NYSDOT purchased and shared with MPOs transportation data through Transearch that are used to develop MPO plans and programs. Purchase and sharing of data by the NYSDOT for MPOs are needed to offset the increasing costs associated with operating an MPO. Having access to free or low-cost data is important to offset the increasing costs of procured data associated to satisfy required products such as performance measures reporting requirements and the development of congestion management processes.
- In the Capital District Transportation Committee, bicycle/pedestrian master plans and corridor studies submitted by villages, towns, and other local governments are eligible for "Linkage Studies," where the MPO may fund up to 75% of the project cost.
- The Capital Region Transportation Authority has regional set-aside funds for Bus Rapid Transit that require a local match commitment. This annual local funding match reaffirms the project sponsors' commitment to the region.
- NYSDOT and the MPOs are working together on Clean Cities Programs and state policy initiatives on climate change and resiliency. There is also a joint funding arrangement on big data and a sharing of expertise between the NYSDOT and the MPOs.

Part II of the Regional Roundtable Discussion Pertained to Identifying and Addressing Major Policy Issues Confronting MPOs and Their Agency Partners

In advance of this Regional Roundtable, the MPOs and their agency partners submitted an assortment of major topics for discussion. The chosen topics and highlights of the discussion are summarized below.

- Getting Projects Delivered—With plans and finance in place, project implementation can be a challenge given individual municipality/agency capacity. Strengthening the implementation process to increase speed and quality will result in significant benefits.
- Capital Region Transportation Committee meetings include a project schedule status report that is educational, informative, and keeps the project sponsors aware of their project's status. In addition, one of the criteria for the selection of TIP projects is "has the project sponsor delivered previous projects on time?" Other roundtable members said they may be reluctant to use that criterion because a sponsor with a weaker delivery track record may still have the best project. The MPOs also work with transportation contractor associations to schedule projects before the construction season begins and to align projects so that the contractors are not overcommitted. Seasonal weather conditions are also considered in the alignment of projects.
- NYDOT provides training to local sponsors on project implementation. Municipalities were required to take training sessions on project implementation before submitting a project for funding. The training session was jointly presented by NYSDOT and FHWA, and an additional training session was required if the local sponsor was awarded a grant.

What does the planner of the future look like? New skills will be needed as we move to the coming decades.

- The planner of the future will be someone who can work with and manage data because things are changing faster than ever. Technology skill sets will continue to be important as planning

has become more of a science than an art. Planners will need to be able to harness social media data and be able to differentiate reliable data from the unreliable data being broadcasted.
- MPOs will recognize that they need planners with different skill sets, including collaboration and communication as well as expertise in land use, sustainability, and data analysis that complement one another to create an effective and balanced MPO team.

Summary of Key Findings

The MPO directors provided a brief overview of their 3C planning process. The Capital District Transportation Committee is the designated MPO for the Albany-Schenectady-Troy and Sarasota Springs metropolitan area. The Greater Buffalo-Niagara Regional Transportation Council is the MPO for Erie and Niagara Counties. The directors noted the diversity of the urban and rural geographic areas that are within their MPO boundaries and the importance of being able to address urban and rural issues as well as varying urban size and complexities. Regional strategic partnerships are an important element of the cooperative planning process. They have long-established working relationships and coordination efforts with the various modes of transportation, including close cooperation with transportation management centers for live traffic management and dynamic simulation. The importance of expediting the delivery of transportation projects resulted in a project delivery workshop that was jointly hosted by the Capital District Transportation Committee and the Capital District Transportation Authority.

The MPO directors emphasized that "active cooperation" with MPO members (e.g., cities, transit agencies, etc.) is essential to the success of the 3C planning process. This means working directly with MPO members to understand their community's transportation needs and project priorities. It then becomes the responsibility of an MPO to develop a Transportation Improvement Program that balances those needs without bias toward highway, transit, or another mode of transportation. The directors also discussed the "regional strategic partnerships" they have initiated with both traditional and nontraditional transportation partners. Both MPOs that participated in the roundtable discussion are hosted by a regional transportation authority.

The New York State area Regional Roundtable discussion was attended by representatives from MPOs, NYSDOT, a transit authority, and federal agencies. It resulted in the following key findings.

- Advisory committees provide an important organizational level within the MPO structure. Advisory committees for equity, freight, operations, and safety focus on important policy and planning issues, which expands the skills and capabilities of MPOs. The Greater Buffalo-Niagara Regional Transportation Council and the Capital Region Transportation Committee use advisory committees that work with many nontraditional transportation partners that previously had a less pronounced role in working with MPOs.
- The New York State Association of MPOs (NYSAMPO) provides a forum for discussion between MPOs and their agency partners that should be replicated throughout the nation. It provides for the sharing of information and a platform to learn the activities of other organizations, including FHWA and FTA. The association has a long history of conducting applied research studies to the benefit of the MPOs and the planning profession.
- NYSDOT purchased and shared with MPOs transportation data through Transearch that are used to develop MPO plans and programs. The purchase and sharing of data by the NYSDOT for MPOs are needed to offset the increasing costs associated with operating an MPO. Having access to free or low-cost data is important to offset the increasing costs of procured data associated to satisfy required products such as performance measures reporting requirements and the development of congestion management processes.
- Bicycle/pedestrian master plans and corridor studies submitted to the Capital District Transportation Committee by villages, towns, and other local governments are eligible for "Linkage Studies" where the MPO may fund up to 75% of the project cost.

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- The Capital Region Transportation Authority has regional set-aside funds for Bus Rapid Transit that require a local match commitment. This annual local funding match reaffirms the project sponsors' commitment to the region.
- The Greater Buffalo-Niagara Regional Transportation Council is involved in risk and market share analysis and has contracted a Smart Mobility Advisor to ensure they are contemporary in their thinking and planning practices.
- NYSDOT and the MPOs are working together on Clean Cities Programs and state policy initiatives on climate change and resiliency. There is also a joint funding arrangement on big data and a sharing of expertise between the NYSDOT and the MPOs.
- In general, the attendees did not feel there was a need for significant changes to the roles and responsibilities of MPOs, states, and federal agencies in the 3C planning process. The role of MPOs has significantly grown over the years as they are now involved in many more issues and at a much deeper level. The 3C planning process provides the MPOs the flexibility they need to engage in a variety of issues that varies from MPO to MPO.
- Project delivery workshops are being used by the NYSDOT, transit agencies, and MPOs to inform project sponsors and MPO members of the status of some ongoing projects. NYSDOT has provided training for project sponsors as a condition to receiving project grants. Some MPOs use project selection criteria that include a sponsor's track record in delivering projects on time as a condition to be included in MPO Transportation Improvement Programs.
- The planner of the future will be someone who can work with and manage data because things are changing faster than ever. Technology skill sets will continue to be important as planning has become more of a science than an art. Planners will need to be able to harness social media data and be able to differentiate reliable data from the unreliable data that is being broadcast. MPOs will recognize that they need planners with different skill sets, including collaboration, communication, and expertise in land use, sustainability, and data analysis that complement one another to create an effective and balanced MPO team.

Summary of Regional Roundtable: Florida

March 19, 2021
3:00 pm–4:45 pm EST

Attendees

Whit Blanton, Executive Director, Forward Pinellas
Gary Huttmann, Executive Director, MetroPlan Orlando
Alison Stettner, Director, Office of Policy Planning, Florida Department of Transportation (FDOT)
Karen Brunelle, Director, Office of Project Development, FHWA Florida Division
Cathy Kendall, Planning Team Leader, FHWA Florida Division
Keith Melton, Director, Office of Planning & Program Management, FTA Region IV
John Crocker, Community Planner, FTA Region IV
Julia Walker, Environmental Protection Specialist, FTA Region IV
Cassandra Borchers, Chief Development Officer, Pinellas Suncoast Transit Authority
Howard Glassman, Senior Planning Consultant, Gannett Fleming, Inc.
Wade Carroll, Project Manager, Metro Analytics, PLLC
Scott Lane, Principal Investigator, Metro Analytics, PLLC

The metropolitan planning organization (MPO) attendees were selected based upon recommendations received from the Association of Metropolitan Planning Organizations and the National Association of Regional Councils. Agency partner attendees were selected based on recommendations received from the MPOs within the state.

Part I: Best Practices, Challenges, Opportunities in the 3C Planning Process

Part I of the Regional Roundtable began with an overview of each MPO's 3C (continuing, cooperative, and comprehensive) planning process and focused on four discussion questions provided prior to the Regional Roundtable discussion.

Overview of the 3C Planning Process

The metropolitan planning organization (MPO) directors provided a brief overview of their 3C planning process.

- MetroPlan Orlando is the MPO for Orange, Osceola, and Seminole counties in Central Florida. MetroPlan Orlando noted their organization has a long institutional life that is strengthened by having well-established working relationships with counties, municipalities, and transportation organizations that are members of MetroPlan Orlando and serve on their board.
- However, MPOs must also work across metropolitan areas and jurisdictional boundaries to engage in regional planning activities. The Interstate 4 Corridor study group represents an alignment of large and continuous metropolitan areas that form a megaregion, where multiple MPOs in concert with the FDOT are creating a regional Transportation System Management & Operations (TSM&O) program.
- MetroPlan Orlando is engaging nontraditional partners, such as public health organizations, in their long-range planning in order to work with them in deciding how to include health considerations in the planning and programming of transportation dollars. Likewise, they are bringing utility companies into the planning process to address future electric vehicle charging station locations that will be needed to support the continued growth of alternative fuels and modes of transportation.
- Forward Pinellas is a single-county MPO in the Tampa Bay Area that has nine advisory committees and is governed by a 13-member board of elected officials. Forward Pinellas noted that many of the issues that MPOs face are "continuous," and therefore, the partnerships they establish need to be long-lasting. The executive director noted that "MPO long-range planning is where everything comes together."
- Forward Pinellas is unique because it is a land use and Transportation Planning Organization. Land-use decisions come first and then the transportation projects are right-sized accordingly to support the land-use decisions.
- Forward Pinellas concentrates on the different community needs and seeks public input through focus groups, opportunity gatherings, and innovative public involvement techniques. As a built-out metropolitan area, the public involvement comments clearly show that people want transit, bicycle paths, and trails instead of more roads.

Question 1: How can MPOs and their agency partners be poised and equipped to better address current and future opportunities and challenges (pandemics, market disruptions, or other unexpected events)?

- Many MPOs and their agency partners were not prepared to address the COVID-19 pandemic and the challenges it created. While the 3C planning process was generally disrupted, some MPOs were more successful than others in handling this unexpected event.
- As observed by the FHWA, the MPOs who were the most successful had in place a Continuity of Operations Plan (COOP) for emergencies, an ongoing communication network between the MPO and its agency partners, and prior experience in testing out new planning tools and technologies. A COOP addresses actions and procedures an organization will use during an emergency event. Some MPOs had a COOP that allowed them to have alternate public

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involvement methods during the emergency without having to amend their public involvement plan to use them.
- Regarding the public's involvement in transportation planning activities, the pandemic created many interesting results. Forward Pinellas and MetroPlan Orlando both experienced a significant increase in the number of people who participated in MPO planning activities using virtual rather than in-person attendance. At some events, attendance increased from 50 to 60 people to 500 to 1,000 people using virtual meeting communication tools. Hybrid meetings were introduced consisting of some meeting attendees having a physical presence (a requirement under Florida law to take formal action), while other attendees participated only virtually. The Regional Roundtable attendees concurred that hybrid meetings are necessary, but they warrant additional study because they continue to be difficult to arrange and conduct.
- The state and federal agencies are trying to assimilate the new meeting technologies into the traditional planning and decision-making process. The FDOT has acknowledged that hybrid meetings are the new normal and have established guidelines the agency must follow.

Question 2: What strategies can be used to improve the efficacy of MPOs and their agency partners in implementing the 3C planning process?

- Financial incentives are being used by the MPOs with local governments to advance Complete Streets and bicycle and pedestrian programs. Instead of simply developing and promoting a new policy, Forward Pinellas and MetroPlan Orlando have created programs that reward local governments who participate. Forward Pinellas has dedicated $100,000 in federal planning (PL) funds for local linkages projects that support the connection between land use and transportation. Likewise, MetroPlan Orlando has allocated a portion of its federal urban funds to local government Complete Streets, bicycle, and trail projects.
- To improve the efficacy of the MPO 3C planning process it needs to be clear and easy to understand by all participants. The FDOT noted how important it is for the department to fully understand the MPO project priority lists. The top project priorities need to be clearly identified by the MPOs, which is not always the case when multiple project priority lists are submitted by an MPO. The interpretation and administration of state policies and regulations should be clearly understood by all participants in the planning process.
- Flexibility in the interpretation and implementation of planning rules could also lead to a more efficient planning and project delivery process. The Pinellas Suncoast Transit Authority noted that efficiencies in the delivery of projects could be improved by allowing pre-award authority to agencies who seek to advance projects that are in the outer years of the department's work program.
- The FTA noted the difficulty they have in attending and participating directly with Florida's 27 MPOs due in part to the FTA's centralized office location in Atlanta, Georgia. While the FTA has over the years attended some statewide MPO meetings, they need to have direct discussions with MPOs that are engaged in large-scale transit projects. To overcome their shortage in travel funds, the FTA requires local staff to attend major project meetings at FTA before a preferred option is chosen.

Question 3: Should the roles, responsibilities, and resources of MPOs change in relation to their state, regional, and local transportation partners?

- Since the early passage of the Intermodal Surface Transportation Efficiency Act in 1991, there has been little change to the population benchmarks used to establish MPOs and Transportation Management Areas (TMAs). While MPO responsibilities vary between TMA and non-TMA areas, few provisions recognize the "capacity" of an MPO to assume new responsibilities, including some that are currently granted to state DOTs and other transportation entities.

- It was also noted that relationship building is key to the sharing of roles and responsibilities. The attendees felt that the process is working if the MPOs and their agency partners can continue to work together. An overhaul of the process is unnecessary as the MPOs are just getting to understand the newly enacted requirements for performance measures and management systems.

Question 4: What are some noteworthy best practices in the 3C planning process that could be replicated (or not) by other MPOs?

- A shared planning process is being used to promote a common vision and mission between organizations within an MPO area. Forward Pinellas shares a common vision with the Pinellas Suncoast Transit Authority, and together, they have branded their long-range transportation plans as Advantage Pinellas. Investment corridors were identified by the county to direct funding decisions for land use, transportation, and housing.
- Interstate 4 Corridor Regional Transportation System Management & Operations (TSM&O) program includes five MPOs and multiple FDOT districts.
- Regional transportation planning and coordination throughout the state where multiple MPOs came together and established separate Regional Transportation Planning Organizations, including the Central Florida MPO Alliance and the West Central Florida MPO Chairs Coordinating Committee in the greater Tampa Bay Area.
- FDOT developed an MPO Program Management Handbook that is used by the department's central office, district offices, and MPOs to implement the various state and federal requirements that apply to MPOs. The FDOT is embarking on a template for MPO Unified Planning Work Programs to streamline the planning process.
- Florida MPO Advisory Council (MPOAC) was created by state law and serves as a forum for collective decision-making by Florida's 27 MPOs. The MPOAC brings MPOs, FDOT, and federal agencies together every quarter to address state and federal transportation issues that affect MPOs.
- The role of nontraditional transportation partners is growing in the MPO 3C planning process and includes health planning professionals, utility companies, and the business community.
- Continuity of Operations Plans (COOP) enabled MPOs during the COVID-19 pandemic to have alternate public involvement methods in place during the emergency without having to amend their public involvement plan to use them.
- Forward Pinellas has dedicated $100,000 in federal planning funds for local linkages projects that support the connection between land use and transportation. Likewise, MetroPlan Orlando has allocated a portion of its federal urban funds to local government Complete Streets, bicycle, and trail projects.

Part II of the Regional Roundtable Discussion Pertained to Identifying and Addressing Major Policy Topics Confronting MPOs and Their Agency Partners

In advance of this Regional Roundtable, the MPOs and their agency partners submitted an assortment of major topics for discussion. The topics chosen and highlights of the discussion are summarized below.

- Proactive planning approaches for changing transportation technologies. MPOs need to anticipate and address the growth of new technologies in planning processes. Micromobility, streetscapes, scooters, and alternatively fueled vehicles will be a major future consideration for MPOs and their partner agencies. The challenge that MPOs face will be attempting to meet the multimodal needs established in MPOs' long-range transportation plans while experiencing declining transportation revenues, due in part, to many of these new technologies.

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- How will MPOs address the need for transportation data in the future? Data needs are an important issue that MPOs throughout the country now face. MPOs play an important role in performance measure reporting and congestion management plans. There is a clear need for readily available and affordable data to support those MPO planning requirements. The types of data are also changing as MPOs move away from level of service and trip count data and begin to move toward data that reflects travel behavior. The need for data resources and a data governance structure is an equally important issue.

Summary of Key Findings

MetroPlan Orlando is the MPO for Orange, Osceola, and Seminole counties in Central Florida. MetroPlan Orlando noted their organization has a long institutional life that is strengthened by having well-established working relationships with counties, municipalities, and transportation organizations that are members of MetroPlan Orlando and serve on their board. However, MPOs must also work across metropolitan areas and jurisdictional boundaries to engage in regional planning activities. The Interstate 4 Corridor study group represents an alignment of large and continuous metropolitan areas that form a megaregion where multiple MPOs in concert with the FDOT are creating a regional Transportation System Management & Operations (TSM&O) program. MetroPlan Orlando is engaging nontraditional partners such as public health organizations in their long-range planning in order to work with them in deciding how to include health considerations in the planning and programming of transportation dollars. Likewise, they are bringing utility companies into the planning process to address future electric vehicle charging station locations that will be needed to support the continued growth of alternative fuels and modes of transportation.

Forward Pinellas is a single-county MPO in the Tampa Bay Area that has nine advisory committees and is governed by a 13-member board of elected officials. Forward Pinellas noted that many of the issues that MPOs face are continuous, and therefore, the partnerships they establish need to be long-lasting. The Executive Director noted that "MPO long-range planning is where everything comes together." Forward Pinellas is unique because it is a land use and transportation planning organization. Land-use decisions come first and then the transportation projects are right-sized accordingly to support the land-use decisions. Forward Pinellas concentrates on the different community needs and seeks public input through focus groups, opportunity gatherings, and innovative public involvement techniques. As a built-out metropolitan area, the public involvement comments clearly show that people want transit, bicycle paths, and trails instead of more roads.

The Florida area Regional Roundtable discussion was attended by representatives from MPOs, FDOT, federal agencies, and a transit agency. It resulted in the following key findings.

- A shared planning process is being used to promote a common vision and mission between organizations within an MPO area. Forward Pinellas shares a common vision with the Pinellas Suncoast Transit Authority and together they have branded their long-range transportation plans as Advantage Pinellas. Investment corridors were identified by the county to direct funding decisions for land use, transportation, and housing.
- Interstate 4 Corridor Regional Transportation System Management & Operations (TSM&O) program includes five MPOs and multiple FDOT districts.
- Regional transportation planning and coordination throughout the state where multiple MPOs came together and established separate Regional Transportation Planning Organizations including the Central Florida MPO Alliance and the West Central Florida MPO Chairs Coordinating Committee in the greater Tampa Bay Area.
- FDOT developed an MPO Program Management Handbook that is used by the department's central office, district offices, and MPOs to implement the various state and federal requirements

that apply to MPOs. The department is embarking on the development of a template for MPO Unified Planning Work Programs to streamline the planning process.
- The Florida MPO Advisory Council (MPOAC) was created by state law and serves as a forum for collective decision-making by Florida's 27 MPOs. The MPOAC brings MPOs, FDOT, and federal agencies together every quarter to address state and federal transportation issues that affect MPOs.
- MetroPlan Orlando has expanded the role of nontraditional transportation partners in the MPO 3C planning process to include health planning professionals, utility companies, and the business community.
- Continuity of Operations Plans (COOP) enabled MPOs during the COVID-19 pandemic to have alternate public involvement methods in place during the emergency without having to amend their Public Involvement Plan to use them.
- Forward Pinellas has dedicated $100,000 in federal planning funds for local linkages projects that support the connection between land use and transportation. Likewise, MetroPlan Orlando has allocated a portion of its federal urban funds to local government Complete Streets, bicycle, and trail projects.
- Since the early passage of the Intermodal Surface Transportation Efficiency Act in 1991, there has been little change to the population benchmarks used to establish MPOs and Transportation Management Areas (TMAs). While MPO responsibilities vary between TMA and non-TMA areas, few provisions recognize the "capacity" of an MPO to assume new responsibilities, including some that are currently granted to state DOTs and other transportation entities.

Summary of Regional Roundtable: Washington State

March 22, 2021
12:00 pm–1:45 pm EST

Attendees

Kelly McGourty, Director of Transportation Planning, Puget Sound Regional Council (PSRC)
Andrea Weckmueller-Behringer, Executive Director, Walla Walla Valley MPO
Gabe Philips, Multimodal Planning Division, Washington State Department of Transportation (WSDOT)
Matthew Kunic, Planner, FHWA, Washington State Division
Ned Conroy, Community Planner, Federal Transit Administration (FTA) Region X
Peter Heffernan, King County Metro
Howard Glassman, Senior Planning Consultant, Gannett Fleming, Inc.
Wade Carroll, Project Manager, Metro Analytics, PLLC
Scott Lane, Principal Investigator, Metro Analytics, PLLC

Part I: Best Practices, Challenges, Opportunities in the 3C Process

Part I of the Regional Roundtables began with an overview of each MPO's 3C (continuing, cooperative, and comprehensive) planning process and focused on four discussion questions provided prior to the Regional Roundtable discussion.

Overview of the 3C Planning Process

- The MPO directors provided a brief overview of their 3C planning process. The Puget Sound Regional Council (PSRC) is a four-county MPO that consists of a policy board, eight committees,

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and a 60-person staff. The PSRC is engaged in coordination with the other MPOs in Washington and participates regularly in the statewide quarterly meetings that are held with other MPOs and their agency partners.
- The Walla Walla Valley MPO is a bi-state MPO covering all of Walla Walla County, Washington, and Milton-Freewater, Oregon. It is a smaller and newer MPO that was established following the last decennial census.
- The sole function of the Walla Walla MPO is transportation planning. The MPO consists of a 12-member policy board, a technical advisory committee, ad hoc committees, and a two-person staff. The MPO has many of the same responsibilities that are required of larger MPOs, but their work is more compressed.
- The Walla Walla MPO promotes a bottom-up process where the MPO members (cities, counties, transit operators, etc.) bring grassroots issues to the MPO to be discussed and resolved.

Question 1: How can MPOs and their agency partners be poised and equipped to better address current and future opportunities and challenges (pandemics, market disruptions, or other unexpected events)?

- The WSDOT coordinates with the MPOs primarily through regional offices that are linked to the WSDOT Headquarters. The WSDOT and the MPOs have a working partnership that includes a strong department presence in working directly with the MPOs in the development of the required planning documents and reports. This close coordination has been beneficial to the state and MPOs as relatively few MPO corrective actions have been found by the federal agencies during the MPO certification reviews.
- The MPOs and WSDOT participate in quarterly coordinating committee meetings. The coordinating committee meetings add value to the 3C planning process as they provide a forum for discussion and an opportunity to share information. The department noted that a future topic for discussion should be how to better equip the MPOs to participate in the prioritization of transportation projects for all the transportation needs in the state. The two MPO directors at this roundtable discussion serve as the current and past chairs of the coordinating committee. The department works directly with the current and past chairs to set the agenda for each coordinating committee meeting.
- The 3C planning process must also be viewed as being credible and have the trust of all the participants who are involved in the planning and programming of transportation projects. Those participants should include both state and local officials as well as the members of the Washington State Legislature.

Question 2: What strategies can be used to improve the efficacy of MPOs and their agency partners in implementing the 3C planning process?

- A basic strategy that the MPOs employ is to use consensus building and avoid a top-down approach throughout the decision-making process. This strategy supports the intent of Washington's transportation and growth management laws that promote working with the public through a bottom-up and consensus-building approach.
- The development of an agreed-upon investment strategy by the WSDOT and MPOs is under consideration to better align state and MPO planning and funding efforts. The state and MPOs' transportation priorities are the projects contained in the adopted MPO long-range transportation plans.
- The importance of informal, early communication between agency and MPO staff establishes trust and helps align the planning and project development processes. MPO access to WSDOT region staff gives the MPOs the opportunity to work with the state DOT in the early steps leading to the development of MPO plans and programs. It was noted that aligning the boundaries between MPOs and state DOT regions would be a sound strategy to improve the 3C planning process.

- Public involvement continues to be an important strategy leading to the success of an MPO. Quorum challenges will likely become less of a problem in the future if attendees are able to participate through virtual and other creative public engagement techniques.

Question 3: Should the roles, responsibilities, and resources of MPOs change in relation to their state, regional, and local transportation partners?

- The project selection and programming approach used in Washington State is a factor that limits the success of the 3C planning process. MPOs do not select transportation projects and state legislators play an inordinate role in the selection of mobility projects that are programmed for funding. However, change may be in the future because the WSDOT regions, who serve as voting members on the MPOs, understand the need to tie project prioritization and programming to federally mandated performance measures that are being adopted by both the department and the MPOs. The MPOs explained that while they may not have a project selection role, projects do not go into their Transportation Improvement Program (TIP) unless they are consistent with the MPO's adopted vision, goals, and policies. MPOs working together with the state DOT gives them a louder voice in determining their 3C planning process.
- The federal MPO requirements should be less prescriptive and flexibly interpreted by the federal agencies. Washington State has both MPOs and Transportation Planning Organizations (TPOs) that have different but sometimes overlapping responsibilities (TPOs receive state funds to address specific planning requirements contained in state law). A less prescriptive federal process would reduce redundancy between state and federal requirements and result in a more efficient planning process.

Question 4: What are some noteworthy best practices in the 3C planning process that could be replicated (or not) by other MPOs?

- WSDOT and MPOs have established quarterly coordination committee meetings that serve as a forum to exchange information and address the many issues and requirements that pertain to transportation planning. Communication and consensus building are a hallmark of the 3C planning process used throughout the state of Washington. Peer-to-peer exchanges and the sharing of information between large and smaller size MPOs have greatly benefited those MPOs who have fewer financial resources.
- Development and update of statewide formulas used to allocate federal planning and public transportation (5303) funds include the participation of both the WSDOT and the MPOs.
- MPOs and WSDOT have embraced performance-based planning and programming in the development of MPO plans and the selection of transportation projects. Both organizations noted the challenges they face in implementing the state's 3C planning process due in part to legacy projects and the established role of state legislators in the selection of mobility projects.

Part II of the Regional Roundtable Discussion Pertained to Identifying and Addressing Major Policy Issues Confronting MPOs and Their Agency Partners

In advance of this Regional Roundtable, the MPOs and their agency partners submitted an assortment of major topics for discussion. The chosen topic and highlights of the discussion are summarized below.

Changing data—using large data for planning and forecasting, how should data be managed, shared, and applied?

- The attendees explained how the cost and access to the data are major challenges that MPOs face in implementing federal and state transportation planning requirements. The data

department is now the largest department at the Puget Sound Regional Council (PSRC). Data sets are large, expensive, and complex. The use and sharing of data between the WSDOT and MPOs are complicated by proprietary and legal issues.
- Small MPOs feel they cannot fulfill their federal planning requirements without having access to accurate and consistent data. The Walla Walla Valley MPO does not have the budget resources to purchase data and depends on the WSDOT and larger MPOs who have the financial resources to purchase and share data. The MPOs noted that the peer-to-peer exchanges and collaborative planning approach used in the MPOs and WSDOT are important components of their 3C planning process.

Summary of Key Findings

- The PSRC is engaged in coordination with the other MPOs in Washington and participates regularly in the statewide quarterly meetings that are held with other MPOs and their agency partners.
- The Walla Walla Valley MPO has many of the same responsibilities that are required of larger MPOs, but their work is more compressed. The Walla Walla Valley MPO promotes a bottom-up process where the MPO members (cities, counties, transit operators, etc.) bring grassroots issues to the MPO to be discussed and resolved.
- WSDOT and MPOs have established quarterly coordinating committee meetings that serve as a forum to exchange information and address the many issues and requirements that pertain to transportation planning. Communication and consensus building are a hallmark of the 3C planning process used throughout the state of Washington. Peer-to-Peer exchanges and the sharing of information between large and smaller size MPOs have greatly benefited those MPOs who have fewer financial resources.
- Development and update of statewide formulas used to allocate federal planning (PL) and public transportation (5303) funds include the participation of both the WSDOT and the MPOs.
- MPOs and WSDOT have embraced performance-based planning and programming in the development of MPO plans and the selection of transportation projects. Both organizations noted the challenges they face in implementing the state's 3C planning process due in part to "legacy projects" and the established role of state legislators in the selection of mobility projects.

Summary of Regional Roundtable: Arizona

March 26, 2021
11:00 am–12:45 pm EST

Attendees

Tim Strow, Director of Transportation Planning and Policy, Maricopa Association of Governments
David Meilbeck, Executive Director, MetroPlan-Greater Flagstaff
Dan Gabiou, Regional Planning Manager, Arizona Department of Transportation (ADOT)
Ed Stillings, Senior Transportation Planner, FHWA, Arizona Division
Ted Matley, Director of Planning and Programming, Federal Transit Administration (FTA) Region IX
Heather Dalmolin, CEO and General Manager, Mountain Line Transit Agency
Howard Glassman, Senior Planning Consultant, Gannett Fleming, Inc.
Wade Carroll, Project Manager, Metro Analytics, PLLC
Scott Lane, Principal Investigator, Metro Analytics, PLLC

Part I: Best Practices, Challenges, Opportunities in the 3C Process

Part I of the Regional Roundtable began with an overview of the MPOs' 3C (continuing, cooperative, and comprehensive) planning process and focused on four discussion questions provided prior to the Regional Roundtable discussion.

Overview of the 3C Planning Process

The metropolitan planning organization (MPO) directors provided a brief overview of their 3C planning process.

- The Maricopa Association of Governments is the MPO for a two-county region that includes 26 cities and towns and three native nations. The Maricopa Council of Governments has 17 technical committees and eight policy committees and works with multiple partners including transit agencies, the ADOT, and the FHWA Arizona Division.
- Continued coordination and engagement with their transportation partners are key to the success of their planning program. They are actively involved in extending the region's current sales tax for transportation and connecting transportation planning with reliable funding sources. Through long-range planning, they address a comprehensive list of issues such as autonomous vehicles, land use, and population and employment growth.
- The MetroPlan-Greater Flagstaff MPO members include the city of Flagstaff, Coconino County, Northern Arizona University, the Northern Arizona Intergovernmental Public Transportation Authority, and the ADOT. MetroPlan-Greater Flagstaff is dealing with environmental issues as a part of its transportation planning process.
- The city of Flagstaff declared a climate emergency and seeks to reduce emissions by 50%, which has caused the MPO to seek emission-reducing transportation solutions. The transit authority, Coconino County, the state of Arizona, and Northern Arizona University are working together collaboratively to find solutions to this complex problem. This provides the MPO an opportunity to work with its partners to "find common ground, move everyone in the same direction, and facilitate leadership."
- The MPO Executive Director's 21 years of prior experience at a transit agency gives MetroPlan-Greater Flagstaff the opportunity to address environmental and other planning-related issues from a different perspective.

Question 1: How can MPOs and their agency partners be poised and equipped to better address current and future opportunities and challenges (pandemics, market disruptions, or other unexpected events)?

- The MPO staff directors noted at an Association of Metropolitan Planning Organizations (AMPO) national conference that a chart presented showed the rate of rise in MPO funding and the rate of rise in new responsibility and that they quickly diverged. The federal response to adequate MPO funding is not moving at an acceptable rate. Performance-based planning, scenario planning, and other newly enacted planning emphasis areas need to be supported with new MPO funds. This problem is compounded by the use of 2010 census population numbers and highway mileage to determine funding allocations in a growth state like Arizona.
- The attendees noted that "the future is poised with a tremendous backlog of unfunded needs for roads, bridges, and other transportation infrastructure." While federal funding for transportation mobility remained relatively constant over recent years, a $4 trillion infrastructure investment is now being discussed by the new federal administration.
- MPOs need to be able to adjust quickly to these political swings and be ready to accept a future where things happen faster than expected. Regarding electric vehicle technology, it was mentioned that a study suggests that by the year 2040 90% of automobiles will be electric vehicles. Questions raised by the MPO include: How does this reality blend with

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the $4 trillion infrastructure investments being discussed and how do MPOs prepare long-range plans accordingly?

Question 2: What strategies can be used to improve the efficacy of MPOs and their agency partners in implementing the 3C planning process?

- The ability of the FTA to effectively participate in the MPO 3C planning process is often hampered by limited travel budgets and the FTA's multi-state regional organizational structure. The regional administrator for the FTA Region IX headquarters in the city of San Francisco countered this problem by moving an FTA position to the FHWA Arizona Division Office in the city of Phoenix. This staffing arrangement has benefited the federal agencies, the ADOT, and greatly improved FTA's ability to work directly with the MPOs.
- In Arizona, MPOs and the Council of Governments (COGs) have bi-monthly meetings to discuss statewide and regional transportation planning issues. This coordination has built a stronger working relationship between MPOs and their state and federal partners. The importance of strong working relationships between MPOs and their partner agencies is practiced throughout Arizona's 3C planning process. MPOs with smaller budgets have learned that by working cooperatively with larger MPOs, including information and data sharing, they have been able to maximize their available resources. The significant level of collaboration between MPOs in Arizona and their agency partners includes meetings between the ADOT and the MPOs to discuss the upcoming ADOT work program well in advance of its development.

Question 3: Should the roles, responsibilities, and resources of MPOs change in relation to their state, regional, and local transportation partners?

- The attendees noted that the roles and responsibilities of MPOs should always be evaluated and subject to change based on local and regional conditions, but in general the MPO role works very well. The federal government is not in a position to grant MPOs the responsibilities that are typically handled by state or local governments, such as land-use decision-making. Any decision to shift the responsibilities of MPOs and their partners should begin at the state and regional levels.
- The attendees also mentioned that the more important issue surrounding any shift in roles and responsibilities is providing MPOs the funding they need to manage and implement their 3C planning requirements. The planning funds should be consistently applied because all MPOs regardless of their size, have common responsibilities. Likewise, MPOs who have the capacity to do more than what is required by law should be given the opportunity and provided with additional funding to take on additional responsibilities.

Question 4: What are some noteworthy best practices in the 3C planning process that could be replicated (or not) by other MPOs?

- Large-scale corridor studies have been initiated by the Maricopa Association of Governments, such as the Sun Corridor that includes the greater Phoenix area, and other associations of governments and MPOs. A joint planning advisory council was formed in 2009 to jointly coordinate planning efforts and "foster a successful and economically viable Sun Corridor in the state of Arizona" between the Maricopa Association of Governments, the Pima Association of Governments, the Central Arizona Governments, the Central Yavapai MPO, and the Sun Corridor MPO.
- The Ari-Son Megaregion Council was created by an agreement signed between the mayors of Sonora, Mexico, and Arizona in 2014 to increase dialogue and strengthen cross-border economic development efforts. The objective is to expand local government connections, best practices, provide a forum to elevate the voice of local leadership on binational policy matters, and identify areas for opportunity and collaboration.

- MetroPlan-Greater Flagstaff conducts an annual strategic "advance" (instead of "retreat") on vision, mission, and guiding principles for the MPO and region. It includes developing tactics and measurable objectives the region wants the MPO to achieve. This strategic advance helps the MPO to keep moving forward and stay relevant.
- ADOT and the MPOs are working to centralize data collection and are working on a tool to show in an electronic/GIS format the available data as well as the data gaps. ADOT is trying to centralize data on a five-year plan of projects.
- A shared position was created by MetroPlan-Greater Flagstaff and the Mountain Line Transit Agency that is jointly funded and located at the transit agency. This has proven to be a cost-effective way to provide staff services for smaller MPOs and transit agencies.
- The FTA Region IX Administrator in San Francisco moved an FTA planning position to the FHWA Division Office in Phoenix to improve the FTA's ability to effectively participate in Arizona's statewide and MPO transportation planning process.

Part II of the Regional Roundtable Discussion Pertained to Identifying and Addressing Major Policy Issues Confronting MPOs and Their Agency Partners

In advance of this roundtable discussion, the MPOs and their agency partners submitted an assortment of major topics for discussion. The chosen topic and highlights of the discussion are summarized below.

- *The application of new technologies in the transportation planning process*
- The Maricopa Association of Governments is actively involved in Transportation System Management & Operations (TSM&O) planning activities and has an active Intelligent Transportation System (ITS) master plan. An ITS Committee works directly with ADOT on the management of the freeway system.
- Through a pilot program, they support other Arizona MPOs and agencies who are engaged in TSM&O activities and share information to reduce costs and eliminate unnecessary redundancy in program development.
- The Maricopa Association of Governments and MetroPlan-Greater Flagstaff have responded to the COVID-19 pandemic by successfully incorporating new technologies into the 3C planning process. Agency partners, including the FHWA division staff, have found that virtual meetings greatly increase their attendance and ability to participate at MPO meetings. The MPOs have found virtual hybrid meetings (consisting of both in person and virtual attendees) to be an effective communication tool.

Summary of Key Findings

The Maricopa MPO is actively involved in extending the region's current sales tax for transportation and connecting transportation planning with reliable funding sources. Through long-range planning, they address a comprehensive list of issues such as autonomous vehicles, land use, and population and employment growth.

The MetroPlan-Greater Flagstaff MPO is dealing with environmental issues as a part of its transportation planning process. The city of Flagstaff declared a climate emergency and seeks to reduce emissions by 50%, which has caused the MPO to seek emission-reducing transportation solutions. The transit authority, Coconino County, the state of Arizona, and Northern Arizona University are working collaboratively to find solutions to this complex problem. This provides the MPO an opportunity to work with its partners to "find common ground, move everyone in the same direction, and facilitate leadership." The MPO Executive Director's 21 years of prior

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experience at a transit agency gives MetroPlan-Greater Flagstaff the opportunity to address environmental and other planning-related issues from a different perspective. Key findings from the Regional Roundtable discussion included the following.

- Large-scale corridor studies have been initiated by the Maricopa Association of Governments, such as the Sun Corridor that includes the greater Phoenix area, and other associations of governments and MPOs. A joint planning advisory council was formed in 2009 to jointly coordinate planning efforts and "foster a successful and economically viable Sun Corridor in the state of Arizona" between the Maricopa Association of Governments, the Pima Association of Governments, the Central Arizona Governments, the Central Yavapai MPO, and the Sun Corridor MPO.
- The Ari-Son Megaregion Council was created by an agreement signed between the mayors of Sonora, Mexico, and Arizona in 2014 to increase dialogue and strengthen cross-border economic development efforts. The objective is to expand local government connections, best practices, provide a forum to elevate the voice of local leadership on binational policy matters, and identify areas for opportunity and collaboration.
- MetroPlan-Greater Flagstaff conducts an annual strategic "advance" (instead of "retreat") on vision, mission, and guiding principles for the MPO and region. It includes developing tactics and measurable objectives the region wants the MPO to achieve. This strategic advance helps the MPO to keep moving forward and stay relevant.
- ADOT and the MPOs are working to centralize data collection and develop a tool in an electronic/GIS format that shows available data and the data gaps. The department is trying to centralize data on a five-year plan of projects.
- A shared position was created by MetroPlan-Greater Flagstaff and the Mountain Line Transit Agency that is jointly funded and located at the transit agency. This has proven to be a cost-effective way to provide staff services for smaller MPOs and transit agencies.
- The FTA Region IX Administrator in San Francisco moved an FTA planning position to the FHWA Division Office in Phoenix to improve the FTA's ability to effectively participate in Arizona's statewide and MPO transportation planning process.
- Transportation System Management & Operations (TSM&O) planning activities can be expanded in smaller MPOs by establishing collaborative partnerships with larger MPOs. The Maricopa Association of Governments is partnering with smaller MPOs in Arizona to expand TSM&O planning activities in the MPO 3C planning process.

Summary of Regional Roundtable: Texas

March 31, 2021
11:45 am–1:30 pm EST

Attendees

Chris Evila, MPO Program Administrator, Waco Metropolitan Planning Organization (MPO)
Michael Morris, Director, Dallas-Fort Worth MPO
Jessica Butler, Director of Transportation Planning & Programming, Texas Department of Transportation (TxDOT)
Brian Barth, Director of Project Planning & Development, TxDOT
Michael Leary, Director, Planning & Program Development, FHWA, Texas Division
Jose Campos, Planning Team Leader, FHWA, Texas Division
Don Koski, Deputy Regional Administrator, Federal Transit Administration (FTA) Region VI
Tom Lambert, President and CEO, Metropolitan Transit Authority of Harris County (Metro)

Howard Glassman, Senior Planning Consultant, Gannett Fleming, Inc.
Wade Carroll, Project Manager, Metro Analytics, PLLC
Scott Lane, Principal Investigator, Metro Analytics, PLLC

Part I: Best Practices, Challenges, Opportunities in 3C Planning Process

Part I of the Regional Roundtable began with an overview of each MPO's 3C (continuing, cooperative, and comprehensive) planning process and focused on four discussion questions provided prior to the Regional Roundtable discussion.

Overview of the 3C Planning Process

- The MPO directors provided a brief overview of their 3C planning process. The directors noted that the 3C planning process goes back to the 1970s, which means MPOs have a long history of working with their agency partners.
- The Waco MPO coordinates transportation planning for all of McLennan County in Central Texas. The MPO expects to be designated as a Transportation Management Area (TMA) due to the increase in population and the results of the 2020 U.S. Census. A TMA MPO has an urbanized area of over 200,000 in population.
- In Texas, non-TMA MPOs are referred to as "small" MPOs, and TMA MPOs are referred to as "large" MPOs. The Waco MPO, TxDOT, and researchers at Texas A&M University are working cooperatively to evaluate what changes and new requirements will be expected of the Waco MPO resulting from the TMA designation. Small MPOs in Texas have a base amount of funds to operate but not enough to fund special studies as required by federal regulations. TxDOT has set aside a portion of its state planning and research (SP&R) funds for smaller MPOs that need additional funds to conduct their 3C planning activities. MPOs must apply to TxDOT to access those funds. TxDOT also assists the MPOs by using toll credits to provide the non-federal local match that is required for federal planning funds.
- The Dallas-Fort Worth MPO (North Central Texas Council of Governments) serves as the MPO for the 12-county Dallas-Fort Worth region. The MPO is a TMA and notes that the federal planning requirements for large MPOs are basically no different than the requirements for smaller MPOs. However, meeting those basic requirements is much more difficult for small MPOs because they are not able to benefit from economies of scale that are available to larger MPOs.
- The Dallas-Fort Worth MPO can leverage its transportation dollars and has been successful in taking down silos that can hamper the flexible use of transportation funds. The Dallas-Fort Worth MPO is engaged in various levels of planning, which include neighborhood planning, regional planning, and international logistics. Larger MPOs have access to data sources that smaller MPOs cannot locate or afford, and therefore, it is necessary for larger MPOs to assist smaller MPOs in meeting the federal planning requirements.

Question 1: How can MPOs and their agency partners be poised and equipped to better address current and future opportunities and challenges (pandemics, market disruptions, or other unexpected events)?

- TxDOT noted that "unexpected events" will continue to be an issue that transportation planning partners will need to address. It will require a greater need for on-demand decision-making tools and data sources that can be used for real-time decision-making. The recent unexpected climate events that were experienced in Texas illustrated the need for enhanced on-demand decision-making among transportation partners.

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- The 3C planning requirements need to be flexibly interpreted because federal requirements take a long time to change. It is also important for MPOs and their agency partners to constantly assess how well they are working together and recognize that obstacles to collaboration can stem from political and governmental reasons.
- Funding for the 3C planning process needs to be assured and set at a level that enables an MPO to assemble a quality staff that can fulfill the many planning requirements. Federal agencies need to be involved in providing technical assistance, identifying new data sources, and making timely decisions especially when those decisions are elevated within an agency to a higher level.
- For transit, MPOs need to be independent organizations that provide a vision and a sharing of information. Transit agencies promote mobility integration and recognize the important role of MPOs in connecting all modes of transportation with transit plans and services.

Question 2: What strategies can be used to improve the efficacy of MPOs and their agency partners in implementing the 3C planning process?

- New communication skills and techniques will continue to be an important strategy used throughout the 3C planning process. Virtual meetings have been beneficial in improving the efficacy of the planning process and new public participation and outreach problems will continue to evolve.
- The FTA has taken significant actions to enhance its role in the 3C planning process. It has entered into single planning agreements with its counterpart, FHWA Division Office partners, to promote coordinated and consistent transportation planning. The FTA has also transferred Section 5303 planning funds to TxDOT so that those funds can be allocated as part of a consolidated planning grant.
- The Texas Association of MPOs (TEMPO) is a statewide organization that provides a forum for discussion between the MPOs and their agency partners. It provides an opportunity for all the participants in the 3C process to collectively address statewide issues and share information in a timely manner. It is a volunteer organization operating without a paid staff that receives support services from TxDOT and the Texas A&M Transportation Institute (TTI). All MPOs in Texas representing any area or portion of an area within the state of Texas are eligible for membership in TEMPO. Associate membership is extended to the professional staff of TxDOT, FHWA, and FTA.
- An important 3C planning process strategy is to "focus on outcomes." For example, large MPOs are exploring the use of partnership funding agreements with smaller MPOs to assist them in advancing projects that currently have only partial funding in the TxDOT Work Program. This enables projects to move forward in smaller MPO areas while ensuring that the larger MPOs will be reimbursed in the TxDOT Work Program during specified future years.
- The transit operator noted that "measured risks" are another important strategy that needs to be part of the planning process. It is critical for MPOs to get out of the box and think creatively in a way similar to how transit agencies must operate. This includes establishing a vision for the region and relationship building between MPO members (cities, counties, transit operators, etc.) and their state and federal agency partners.

Question 3: Should the roles, responsibilities, and resources of MPOs change in relation to their state, regional, and local transportation partners?

- Regardless of their size, MPOs are facing an enormous challenge in being able to meet the federal planning requirements. To meet this challenge, the attendees suggested different planning requirements based on population thresholds for TMA MPOs. The recommended MPO divisions were non-TMA MPOs, TMA MPOs with a population over 200,000 to 1,000,000, and TMA MPOs with a population over one million. Federal agencies should identify the

top 18 or so requirements they expect MPOs to conduct and assign more of those planning responsibilities and funding to MPOs over one million in population.
- The population growth rate of a state should also be factored into the federal planning fund distribution formula. It is estimated that the state of Texas is expected to grow from 27 million people today to over 47 million people by the year 2050.
- The MPO executive directors noted that "Texas will figure it out" if flexibility is provided to the states on how they address MPO planning requirements. Texas has adopted two propositions to provide additional funding for transportation mobility—a tax on oil and gas and the other a sales tax on motor vehicles.

Question 4: What are some noteworthy best practices in the 3C planning process that could be replicated (or not) by other MPOs?

- The Association of Texas MPOs (TEMPO) is a statewide organization that meets at least quarterly. All MPOs in Texas representing any area or portion of an area within the state of Texas are eligible for membership in TEMPO. Associate membership is extended to the professional staff of TxDOT, FHWA, and FTA. The association has adopted bylaws and among its duties is providing a conduit for the exchange of information and ideas.
- The MPOs are working with TxDOT and the Texas A&M Transportation Institute (TTI) to provide inter-MPO training on specific subjects such as resiliency planning.
- TxDOT is working to assist the MPOs in securing data that is necessary to conduct the requirements of the MPO planning process. It was noted that some data sources restrict the analysis of data to TxDOT.
- Peer-to-peer exchange programs conducted by FHWA have enhanced the MPO planning process. For example, MPOs have participated in managed lanes and fiscal constraint peer-to-peer exchange activities.
- TxDOT has set aside a portion of its state planning and research (SP&R) funds for smaller MPOs that need additional funding to conduct the 3C planning requirements. MPOs must apply to TxDOT to access those funds.
- The FTA Region VI has entered into a single planning agreement with its counterpart FHWA Texas Division partner to promote coordinated and consistent transportation planning. FTA has also transferred Section 5303 planning funds to TxDOT so that those funds can be allocated as part of a consolidated planning grant.
- Large MPOs in Texas are exploring the use of partnership funding agreements with smaller MPOs to assist them in advancing projects that currently have only partial funding in the TxDOT Work Program. This enables projects to move forward in smaller MPO areas while ensuring that the larger MPOs will be reimbursed in the TxDOT Work Program during specified future years.

Part II of the Regional Roundtable Discussion Pertained to Identifying and Addressing Major Policy Issues Confronting MPOs and Their Agency Partners

Part II of the Texas area Regional Roundtable discussion was not held due to time constraints.

Summary of Key Findings

The metropolitan planning organization (MPO) directors provided a brief overview of their 3C planning process. The directors noted that the 3C planning process goes back to the 1970s, which means MPOs have a long history in working with their agency partners. The Waco MPO coordinates transportation planning for all of McLennan County in Central Texas. The MPO

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expects to be designated as a Transportation Management Area (TMA) due to the increase in population and the results of the 2020 U.S. Census. In Texas, non-TMA MPOs are referred to as "small" MPOs, and TMA MPOs are referred to as "large" MPOs. The Waco MPO, TxDOT, and researchers at Texas A&M University are working cooperatively to evaluate what changes and new requirements will be expected of the Waco MPO resulting from the TMA designation. Small MPOs in Texas have a base amount of funds to operate but not enough to fund special studies as required by federal regulations. TxDOT has set aside a portion of its SP&R funds for smaller MPOs who need additional funds to conduct their 3C planning activities. MPOs must apply to TxDOT to access those funds. TxDOT also assists the MPOs by using toll credits to provide the non-federal local match that is required for federal planning funds.

The Dallas-Fort Worth MPO (North Central Texas Council of Governments) serves as the MPO for the 12 county Dallas-Fort Worth region. The MPO is already a TMA and notes that the federal planning requirements for large MPOs are basically no different than the requirements for small MPOs. However, meeting those basic requirements is much more difficult for small MPOs because they are not able to benefit from economies of scale that are available to larger MPOs. The Dallas-Fort Worth MPO can leverage its transportation dollars and has been successful in taking down silos that can hamper the flexible use of transportation funds. The Dallas-Fort Worth MPO is engaged in various levels of planning that include neighborhood planning, regional planning, and international logistics. Larger MPOs have access to data sources that smaller MPOs cannot locate or afford, and therefore, it is necessary for larger MPOs to assist smaller MPOs in meeting the federal planning requirements.

The Texas area Regional Roundtable discussion was attended by representatives from MPOs, the TxDOT, and federal agencies. It resulted in the following key findings.

- The Association of Texas MPOs (TEMPO) is a statewide organization that meets at least quarterly. All MPOs in Texas representing any area or portion of an area within the state of Texas are eligible for membership in TEMPO. Associate membership is extended to the professional staff of TxDOT, FHWA, and FTA. The association has adopted bylaws and among its duties is to provide a conduit for the exchange of information and ideas.
- The MPOs are working with TxDOT and the Texas A&M Transportation Institute (TTI) to provide Inter-MPO training on specific subjects such as resiliency planning.
- TxDOT is working to assist the MPOs in securing data that is necessary to conduct the requirements of the MPO planning process. It was noted that some data sources restrict the analysis of data to TxDOT.
- Peer-to-peer exchange programs conducted by FHWA have enhanced the MPO planning process. For example, MPOs have participated in managed lanes and fiscal constraint peer-to-peer exchange activities.
- TxDOT has set aside a portion of its SP&R funds for smaller MPOs that need additional funding to conduct the 3C planning requirements. MPOs must apply to TxDOT to access those funds.
- The FTA Region VI has entered into a single planning agreement with its counterpart FHWA Texas Division partner to promote coordinated and consistent transportation planning. FTA has also transferred Section 5303 planning funds to TxDOT so that those funds can be allocated as part of a consolidated planning grant.
- Large MPOs in Texas are exploring the use of partnership funding agreements with smaller MPOs to assist them in advancing projects that currently have only partial funding in the TxDOT Work Program. This enables projects to move forward in smaller MPO areas while ensuring that the larger MPOs will be reimbursed in the TxDOT Work Program during specified future years.

- Regardless of their size, MPOs are facing an enormous challenge in being able to meet the federal planning requirements. To meet this challenge, the attendees suggested different planning requirements based on population thresholds for TMA MPOs. The recommended MPO divisions were, non-TMA MPOs, TMA MPOs with a population over 200,000 to 1,000,000, and TMA MPOs with a population over one million. Federal agencies should identify the top 18 or so requirements they expect MPOs to conduct and assign more of those planning responsibilities and funding to MPOs over one million in population. The population growth rate of a state should also be factored into the federal planning fund distribution formula. It is estimated that the state of Texas is expected to grow from 27 million people today to over 47 million people by the year 2050.

APPENDIX C

Literature Review Summary

Summary and Challenges of a Literature Review in a Forward-Looking Study

Appendix C is a summary of the extensive (320 records) literature review and annotated bibliography conducted for this project. Numerous revisions were made to an initial draft review based on the project panel's and the Senior Program Officer's inputs. This research presents challenges to a traditional literature review that, by definition, is backward-looking and assumes that past trends and solutions apply to future conditions. Some insights were valuable in establishing initial topic areas for investigation, particularly with respect to the issues that were brought to the research panel and conference attendees in late 2019 for review, additions, and refinement. As the project progressed, additional literature review items were added throughout the life of the project, and additional best practice information can also be found in the Innovation Database, which was partially informed by the literature review. This cross-pollination of ideas from the literature review to the Innovation Database and Toolkit for the 21st Century was particularly true of the more recent items in the literature. Some of these items were recent or even ongoing at the time of the study and therefore unpublished or not broadly disseminated. These research items came to be termed "gray literature." The literature review was also instrumental in the development of the primary research pathways that were used in both Phase I and Phase II of the project.

Gaps in the Existing Literature. The research team identified that notable gaps exist in the traditional and unpublished literature surrounding MPO roles and innovative practices in e-commerce (previously discussed), transit, micromobility, and the "internet of things" (IoT) as well as public involvement/engagement. Literature on staffing issues is also somewhat limited, particularly with respect to MPOs specifically; some studies exist in the unpublished literature, where simply speaking with MPO staff (such as at roundtables) would likely prove fruitful in filling this research gap. Regarding micromobility and the "internet of things," the only relevant literature found was a NACTO report on micromobility and a report discussing mobility on demand (although this report does not mention MPOs directly). Again, there is a lot of past published literature that does not mention MPOs specifically and, as with staffing issues, researching MPOs online and through roundtable discussions is likely to yield more as MaaS and micromobility rapidly evolve. Part of the purpose of the Innovation Database was to identify and define relevant applied examples of strategies and research that can be transferred to interested MPO staff easily.

External Civic Forces on the MPO. Some topics have a long-standing role within metropolitan planning but were viewed as evolving more rapidly due to the twin experiences of a global pandemic and heightened attention on social equity issues expressed (for example) through the Black Lives Matter movement. Communication that is effective and timely became more challenging for some disadvantaged groups, particularly those with low access to technology. These experiences continue to inform how MPOs should and will engage various stakeholder groups.

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Overview

Developing a framework for studying past literature relevant to this project presents two main challenges. First, the nature of this NCHRP project is broad, covering 12 disparate but sometimes overlapping topics. Second, this research is supposed to be forward-looking and, by definition, past research has been conducted only on events and trends that occur in the past.

As suggested in many panel comments in the first draft of the literature review summary, the value of a planning literature review is based in large measure on the idea that the past is a reliable predictor of the future or at least those past experiences are applicable for future problems. So how much value can a backward-looking literature review have for a forward-looking resource meant to help MPOs and their allies grapple with revolutionary change at an unprecedented pace as they plan for mobility in 2050 and beyond? The past is not always a reliable predictor of the present and will be even less of one in the future. Also, the current environment in which this project is being conducted is coincidental with the outbreak, spread, and effects of a global pandemic that has shifted attention and resources in ways unforeseen during the scoping of this project. Nevertheless, the literature search helped to evolve the research topics and created a resource that the research team could turn to for additional insights throughout the course of the project.

Key Topics Suggested by Literature Review

- Changes presented by Technology (scenario planning, big data)
- Changing Demographics, Lifestyle Trends, and Travel Patterns
- Freight Impacts (including effects of e-Commerce)
- Resiliency Planning and Actions (including climate change)
- The MPO Role in Financing Projects and Using All Funds Effectively
- Emerging MPO Roles in Transit (including new technology & services)
- Staff Capacity, including Number and Technical Proficiency
- The MPO Role in Financing Planning or Other Services/Operations
- Responding to "IoT," On-Demand Services, Micromobility
- Supporting Affiliated Objectives, like Safety, Security, Economy, Equity
- Collaboration/Engagement with Public, Stakeholders, Officials
- Collaboration in Large Regions (including learning from other MPOs)

Part of this hurdle was overcome by the research team's efforts at searching for and summarizing what the research team referred to occasionally as gray literature—information that is unpublished in traditional academic locations. The research team identified more than 320 articles related to innovative MPO programs, policies, and organizational structure. The articles were identified by searching databases of academic journals, including Scopus, Web of Science, and Google Scholar using search terms derived from the list of "hot topics" developed by the research team. The research team examined the methodology and focus of studies related to the hot topics and selected reports that evaluate programs or policies that have actually been implemented by MPOs for in-depth review. The goal was to identify the most relevant articles related to each research topic.

Based on feedback provided by the research panel on an initial literature review and summary, the research team has prepared the following summary of research topics as well as the implications for this project, including gaps in the research. The work is organized around main

categories into which most of the literature falls: case studies and policy. A final section focuses on a summary of the unpublished literature review conducted by the research team.

Published Case Study Literature

It is frequently the context of many studies and research that a substantial part of the effort is spent understanding what MPOs are actually doing and how they are doing it. For example, *Connected Vehicle Impacts on Transportation Planning: Primer and Final Report* (Krechmer et al. 2016) provides planners with a primer on how state DOTs, MPOs, and local agencies should address the impacts of connected and automated vehicle (CAV) technology in their work. The first two sections include a description of the technologies and their potential impacts, and a summary of those impacts on planning goals, objectives, products, tools, and data. Impacts are examined in 11 case studies designed to help planners incorporate CAV technologies into planning practice:

1. Transportation Improvement Program;
2. Statewide Intelligent Transportation Systems (ITS) Architecture;
3. Bicycle and Pedestrian Plan;
4. Long-Range Metropolitan Transportation Plan;
5. Transportation Asset Management Plan;
6. Strategic Highway Safety Plan;
7. State Implementation Plan;
8. Transit Development Plan;
9. Public Involvement Plan;
10. Freight Plan; and
11. Financial Plan.

The report also summarizes research and recommendations on the tools, techniques, and data required to evaluate CAV-related investments. Gaps in current models and data are identified and a research program for addressing these needs is presented. Recommendations are included for new and enhanced training programs oriented toward planners, including content, audiences, and delivery methods.

Other case-study-oriented research includes *Integrating Shared Mobility into Multimodal Transportation Planning: Metropolitan Area Case Studies* (McCoy et al. 2019). This report provides three case studies of how MPOs and their regional partners are integrating shared mobility into regional multimodal transportation planning. The Boston, Massachusetts, Dallas-Fort Worth, Texas, and San Francisco Bay metropolitan areas are featured. Another resource is "Planning for Social Equity and Emerging Technologies" (Kuzio 2019). This article explores how 20 MPOs prepare for emerging technologies and consider their implications for equity. A qualitative content analysis of regional transportation plans (RTPs) finds that 80% of plans in the study sample plan for social equity beyond the current environmental justice requirements; 70% mentioned emerging technologies, and 20% considered the equity implications of those technologies. The article also highlights promising practices from a number of areas, including the Southern California Association of Governments addressing both equity and emerging technology planning and the RTP of Madison, Wisconsin, providing consideration of the equity implications of emerging technologies.

Published Policy Literature

Technology Influences on Policy. In the current context, the word "policy" may refer to organizational matters or how land use, environmental, high-tech, and other matters interact with transportation generally and MPO work specifically. An example pertaining to the cross-cutting

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technology topic is by Lederman, Taylor, and Garrett (2016), *A Private Matter: The Implications of Privacy Regulations for Intelligent Transportation Systems*. The study surveys the current state of legal and industry-led privacy protections related to intelligent transportation systems (ITS) and finds that the lack of existing standards, rules, and laws governing the collection, storage, and use of such information raises troubling privacy questions and potentially hinders the implementation of useful ITS technologies. A similar study (Jordan, Makler, and Bertini 2014), *State of Knowledge and Practice Opportunities for Intelligent Transportation Systems in the Energy Arena*, examines the capacity of ITS to reduce energy consumption in the transportation sector. ITS has the potential to reduce vehicular delay and vehicle miles traveled (VMT), although the benefits of these VMT reductions are uncertain. The shortage of empirical evidence of ITS benefits might be a function of the limited interest in the energy and environmental benefits of ITS compared with the interests in congestion and safety or simply the difficulty of establishing strong monitoring and reporting practices.

Emergent Funding and Financing Mechanisms, and MPO Roles. One research item that touches on both resiliency and funding topics in this research is that completed by Greene (2011), *What Is Greener Than a VMT Tax? The Case for an Indexed Energy User Fee to Finance US Surface Transportation*. Charging highway users per mile has been proposed as a replacement for the U.S. motor fuel tax. A user fee levied on all forms of commercial energy used for transportation and indexed to the average efficiency of vehicles on the road would induce two to four times as much reduction in greenhouse gas emissions and petroleum use as a pure mileage fee. Such a fee is not a substitute for pricing greenhouse gas emissions, though, as it would make only a small contribution to reducing petroleum dependence. The role of MPOs in leading or facilitating funding and financing is likely to become more important; this led directly to the development of one of the Information Forum topics.

Roles in Transit Planning. The role of MPOs in transit planning varies greatly with many smaller MPOs having a more limited role that is controlled by a separate city agency. Literature found on MPO roles in transit is therefore somewhat limited to FTA resources and larger MPOs, although exceptions exist, such as the publication *The Innovative MPO Smart Planning, Strong Communities: A Guidebook for Metropolitan Transportation Planning* (Transportation for America 2014).

Unpublished Literature Search

To better address current research and work efforts that may be forward-looking, innovative, and relevant to the practical needs of MPOs that this research project has as its primary goal, the research team searched MPO websites, reports, and conference proceedings to gather information that may not yet be published in academic journals or other established resources. Generally, this information has not been peer-reviewed but is more likely to be "fresh" and relevant than older, published resources. These examples have been included in the non-academic literature search because MPOs may find such innovative practices relevant to their own work. This review will summarize and discuss some of the most innovative practices in regional transportation planning found in non-academic literature.

Technology and Adaptation. One of the most pressing issues facing MPOs of all sizes is how to confront the reality of rapidly changing technology. Automated and connected vehicles are one of the largest concerns, as the technology to fully automate motor vehicles is beginning to make automated transport a reality. It seems more common for autonomous vehicle (AV) technology to be addressed at the state level. For example, the state of Florida requires its MPOs to "consider" changes in infrastructure needed to accommodate AVs, although a survey of MPOs in the state revealed a general sense of uncertainty regarding the future impacts of AVs

(Srinivasan et al. 2016). A study by the Pennsylvania Department of Transportation offered recommendations for AV implementation that is likely relevant to regional planning (Mashayekh, Biehler, and Hendrickson 2014). A publication from the American Planning Association brings up the point that planners may want to consider AV technology for transit (Crute et al. 2018). This could complicate the introduction of AVs, but there should be a concerted effort at the regional level to ensure that AVs do not exacerbate sprawl.

Big Data. Another challenge brought about by technological advances is the advent of big data. Governments and private organizations now have the ability to collect unprecedented amounts of data, including transportation data, as both collection and storage of data have become increasingly automated and cost-effective, although such data has a range of error for smaller movements of people and has not been approved by U.S. DOT/FHWA at this time. MPOs often find themselves needing to effectively manage large quantities of data, which can be a daunting task for staff members not well versed in data management. The state of Florida has required MPOs to analyze their regions' transit services based on six criteria, a practice that is increasingly reliant on data. The Mid-America Regional Council (Kansas City) (Vandervalk et al. 2017b) and Hillsborough MPO (Tampa) (Vandervalk et al. 2017a) have piloted U.S. DOT's guide for creating a Roadway Transportation Data Business Plan, which is designed for managing and using mobility-related data in transportation planning. It can also help MPOs to better understand how mobility-related data can be used to support various regional initiatives, including the implementation of AV technology. This may be one of the most promising federally led programs designed to help MPOs handle data use and management.

Forecasting. Travel demand modeling is another area of regional planning that is affected by changing technology and vehicle-use trends. Previously, travel demand modeling was difficult to access for small and even mid-sized MPOs due to the complexity of developing travel demand models and limited funding. The Illinois Center for Transportation established a framework for small and medium MPOs to create their own travel demand models within a context of limited financial resources (Ullah et al. 2011). This effort gave special attention to simplicity and accuracy in travel demand models and has been successful in equipping smaller MPOs to engage in travel demand modeling. The State of Georgia has also worked to improve such modeling by reconciling differences between state- and regional-level travel demand models, which often conflict. Georgia has developed a unified attribute table for use by both state and regional-level demand models, allowing for seamless comparison between GDOT and MPO data and models (Circella et al. 2018).

Travel Pattern Changes. This topic is closely correlated in the long term with demographic changes and land-use integration. Congestion is one of the key concerns in regional planning, especially in areas with rapid population growth and auto-centric design. The Michigan Department of Transportation has created a congestion mitigation "toolbox" for use statewide, inclusive of MPOs. This toolbox is designed to help with understanding, developing, planning, and implementing congestion mitigation strategies, providing 47 different strategies for congestion control that can be applied based on regional contexts. Similarly, the state of Virginia has developed a set of guidelines for active traffic management including variable speed limits, queue warning systems, and dynamic freeway ramp metering. MPOs are encouraged to consider the state guidelines for congestion control when crafting their long-term plans. MPOs in Boston, Dallas-Fort Worth, and San Francisco have begun to incorporate shared mobility planning into their regional transportation plans, recognizing that shared mobility can play a role in congestion management. The FHWA has published a primer on the value of incorporating travel-time reliability into the MPO congestion management process (Culotta et al. 2019). The primer draws on applied research and best practices at regional agencies nationwide, including MPOs in Las Vegas, Dallas-Fort Worth, Binghamton (NY), Madison (WI), Philadelphia, Durham-Chapel Hill-Carrboro (NC), and Rochester (NY), as well as the California Department of Transportation. Finally, Dadashova

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et al. (2018) identified six key external factors that planning agencies should consider when creating transportation plans: traffic volume, number of employed persons, number of building permits, rental vacancy rate, fuel price index, and economic conditions index.

Freight and Goods Movement. A subcategory of transportation, freight must also be considered in the regional planning process, critical for MPOs and subareas within their planning boundaries that feature major truck routes, port facilities, and airports. Significant increases in freight traffic are expected due to the rise of e-commerce in recent years (and has been amplified by the global pandemic's negative effects on brick-and-mortar shopping), but relatively little has been published regarding e-commerce. There is evidence that this is starting to change, however. The Florida Metropolitan Planning Organization Advisory Council has published a useful summary of e-commerce effects (FMPOAC n.d.). The Boston Regional MPO launched a study in 2019 and published a related report, *Future of the Curb* (Boston Regional MPO 2019), which looks at competing uses for curbside lane space such as bicycle lanes and loading/unloading areas for e-commerce. Existing literature addresses freight more generally, and it is likely that concepts from this literature can be applied to e-commerce in some instances. AMPO, a strong MPO supporter and hub for information, has a freight committee, and FHWA has a "Talking Freight" webinar series. FHWA also has a guidebook for state DOTs and MPOs as they seek input from the private sector in freight planning (Wilbur Smith Associates and S. R. Kale Consulting 2009). In 2019, FHWA published the third edition of their *Quick Response Freight Methods*, which provides planners with factors affecting freight demand, locating freight data, and freight forecasting (Beagan, Tempesta, and Proussaloglou 2019). Other FHWA resources include a report identifying best practices and tools for understanding various factors affecting freight movement, trip generation, and demand (Hardy 2018); a primer on improving urban freight management (John A. Volpe Center 2018); and the SHRP2 Implementation Assistance Program (Schaefer et al. 2017).

Climate Change and Resiliency. Climate change presents a new set of challenges that MPOs previously did not need to consider. The topic of climate change continues to be one of the most difficult for planning agencies at all levels in the United States, and MPOs are no exception. The polarized nature of the discussion around climate change may be a factor in the approach MPOs take on the subject, which tends to lean toward climate resiliency rather than preventive measures. As one NCHRP panel member noted, it may be that MPO member agencies and political appointees are reluctant to take on greenhouse gas and climate change matters, not MPO staff. The related concept of resiliency suggested one of the topics that was later developed into an Information Forum.

Nonetheless, MPOs and their partner agencies have been working in recent years to address the problems posed by climate change and resiliency (two topics that are related and overlapping but not synonymous). The FHWA, in partnership with AMPO, conducted a series of peer exchange workshops in 2007 and 2008 with MPOs on the topic of climate change. Thirteen MPOs of various sizes shared their experiences at the final workshop in Seattle in 2008: Tri-County Regional Planning Commission (Peoria, IL), MetroPlan (Orlando), Durham-Chapel Hill-Carrboro MPO (NC), DRCOG (Denver), Metropolitan Transportation Commission (San Francisco Bay Area), Baltimore Metropolitan Council, Cowlitz-Wahkiakum COG (Kelso, WA), Atlanta Regional Commission, Ithaca-Tompkins County Transportation Council (NY), Chicago Metropolitan Agency for Planning, Mountainland Association of Governments (Orem, UT), Boston MPO, and Puget Sound Regional Council (Seattle). The Sound Transit Climate Risk Reduction Project was conducted in Seattle in 2013 to assess the potential impacts of climate change on Seattle's transit system and identify ways to improve resiliency. A related report concluded that most climate effects will be mild to moderate in the United States, but also acknowledged the difficulty of predicting future climate scenarios and those future scenarios could be more severe than general predictions (Binder et al. 2013). This study was not directly

conducted by an MPO, but it is a good example of transportation planning officials taking a serious approach to evaluating climate change risks. Similarly, the U.S. DOT has engaged MPOs directly in climate change planning, and a good example of this is the Gulf Coast Project Phase 2. The project used the Mobile, Alabama, MPO as a pilot for evaluating the vulnerability of regional highways, ports, airports, rail networks, and transit. The pilot looked at factors including temperature, precipitation, sea-level rise, storm surge, and wind and built on previous research that determined which transportation assets are most critical and developed climate scenarios. This project has a high potential to be utilized by other MPOs, especially those in coastal regions similar to Mobile.

Affiliated Objectives of MPOs. MPOs may often be called upon to help support a wide array of affiliated objectives, including social justice, accessibility, safety, and health. An example is a report by Fields et al. (2018) that discusses research on evaluating transportation disadvantages for older adults. The study involved the creation of an app that tracks planned, completed, uncompleted, and unserved trips for older adults. The data could be used to evaluate how transportation affects the app user's mood and quality of life. Williams and Seggerman (2014) discuss best practices for multimodal transportation in Florida, which can increase accessibility for many underserved groups. Their report provides guidance on establishing community vision and priorities; analysis of current and future conditions; establishing quality and level of service standards; and future transportation network planning strategies. Another study surveyed state-level crash data to determine how highway safety agencies' relationships with MPOs can be better utilized to improve transportation safety programs and policies. Lyons et al. (2012) have proposed a framework by which MPOs can integrate health into their planning process. They recommend a holistic approach to health, including consideration of active transportation, air pollution goals, and access to opportunities for healthy lifestyles in transportation plans. Four MPOs are used as case studies for health-focused planning: Puget Sound Regional Council (Seattle), Nashville MPO, Sacramento Area Council of Governments, and San Diego Association of Governments. One important point the authors made was that MPOs typically must develop unique approaches to health, despite health challenges being generally similar across regions. Regional context was identified as an important factor in decision-making, which is likely true for other affiliated objectives as well.

Financial and Funding Roles at the MPO. Funding and project financing are not new issues for MPOs, and there is no indication that this will change in the future. Declining gas tax revenue is one of the biggest concerns. A study in Georgia confirms this, having used a model to predict that improved fuel economy, increasing fuel costs, and adoption of electric vehicles will significantly reduce fuel tax revenue (Cherry and Meyer 2012). An Arizona study noted that best-case scenario predictions have existing funding sources remaining static (Ginn, Pryor, and Meyers 2018). Most of the gray literature tends to discuss strategies to secure funding in addition to fuel-surcharge revenue, possibly indicating MPOs see the gas tax revenue decline as inevitable.

As with e-commerce, the impacts on traditional revenue streams from the COVID-19 pandemic are large and likely will last well past the resolution of health issues. One panel member noted in the comments on the original literature review that the topic of value capture and the MPO role in that practice need to be sought out. FHWA has developed technical support for value capture generally that may not be well known by MPO staff (located at https://www.fhwa.dot.gov/ipd/value_capture/capacity_building/webinar_series/). Small MPOs are likely to be hit hardest by funding issues, and the Ohio Department of Transportation (ODOT) has attempted to provide funding guidance for small MPOs in that state. ODOT allocates funding to small MPOs on a per capita basis using a formula derived from the distribution formula for larger MPOs. Recognizing that large project financing is difficult for small MPOs, ODOT offers

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two solutions: state infrastructure bank loans and borrowing funds initially allocated to other MPOs. These solutions are designed to provide creative short-term solutions to funding issues but do not address structural deficiencies in funding for MPOs. The state of Texas has incorporated MPO submodels into its Texas Revenue Estimator and Needs Determination System (TRENDS). This tool is designed to forecast revenue and expenses for TxDOT through 2035. The TRENDS tool can be an effective way to evaluate the effect of declining gas tax revenue on overall funding, as fuel efficiency and taxes are variables that can be manipulated in the funding model. One relatively new source of funding for transportation is the RAISE (formerly BUILD and TIGER) federal grant program, and, while some MPOs played a role in the selection of these grant projects, this type of funding was intended as an economic stimulus rather than a long-term solution. The previously mentioned Arizona study suggests that tolls and other types of road pricing can serve as alternative revenue-generation methods in addition to controlling congestion.

Staff Capacity and Retention. Staff capacity, like funding, is also related to the size of MPOs. This relationship can be partially attributed to the fact that smaller MPOs with lower funding may struggle to hire appropriate numbers of staff, or that the pool of candidates is simply smaller than in large MPOs or megaregions. Regardless of size, however, staff limitations can affect all MPOs. In an oft-cited resource, Kramer et al. (2017) studied how MPOs have structured their agencies and allocated staff resources and expertise in their work. Five MPO case studies are used to provide examples of organizational structure and lessons learned: Hampton Roads Transportation Planning Organization (Norfolk, VA), Chittenden County Regional Planning Commission (Burlington, VT), Kittery Area Comprehensive Transportation System (southern Maine), Regional Transportation Commission of Southern Nevada (Las Vegas), and Portland Metro. The report covers MPO governance, administrative structure, employees and specialization, funding and work programs, workforce issues, and scenario planning. Various technical guides also exist to assist MPOs in new types of planning, such as FHWA's handbook for MPOs working on active transportation plans (Lyons et al. 2012). Distilling useful strategies from disparate, often unpublished, sources within MPOs that have studied this issue is a challenge but presents an opportunity for making a major contribution in an area identified as a top priority during this project and MPO survey.

MPO Collaboration, Including in Large Regions. One positive trend that emerges from the gray literature is the degree to which collaboration occurs among MPOs. Peer learning can be an effective way for MPOs to share innovative practices with other MPOs. Interagency collaboration can be especially beneficial to the regional planning process when MPOs consider practices developed in allied fields to deal with similar challenges. This area of study has been established for a long time: in 1994 NARC (National Association of Regional Councils) studied partnerships between MPOs and the freight railroad industry. The report suggests that MPOs can improve decision-making, particularly regarding freight, by bringing railroads to the table. The report also offers case studies from Philadelphia, Columbus, Toledo, Kansas City, and Southern California regions (NARC 1994). Markiewicz et al. (2016) developed a handbook for transportation agencies that engage in regional cooperation efforts. The handbook provides a framework for thinking about cooperation opportunities and offers 20 case studies from MPOs and other transportation agencies around the country. In addition, examples of peer exchange workshops are plentiful and included:

- TOD Development in Southern Nevada peer exchange in Las Vegas in 2015;
- Regional Cooperation on Bike/Ped and Transit Connections peer exchange in Salt Lake City in 2016;
- Regional cooperation on environmental justice in transportation planning in Ohio in 2016;
- I-10 Corridor Collaboration peer exchange in Arizona in 2016;

- State DOT Tribal Liaison roundtable in California in 2016;
- Regional Models of Cooperation in Transportation Planning peer exchange in Alaska in 2017; and
- Freight Planning and Regional Cooperation in the Piedmont Atlantic Megaregion peer exchange in Atlanta in 2017.

Peer exchange events and information are popular ways of informing MPO staff and partners on pertinent topics, making them likely to continue as a tool for disseminating information in the future. This understanding influenced the course of revisions for Phase II of this study.

APPENDIX D

Conference Activities Summary

The research team was required to quickly coordinate with conference organizers in order to procure space at each of the three conference events in late 2019: APTA (American Public Transit Association), AMPO (Association of Metropolitan Planning Organizations), and NARC (National Association of Regional Councils). These three conferences and organizations were cited in the scope of work as ideal target audiences for the initial outreach to MPOs and partnering agencies. Due to time constraints and varying conference arrangements, the research team had to develop specific approaches to engaging people at each event. The generalized process, along with exceptions for each conference, is listed below.

Objectives of Conference Outreach

- Raise awareness of this research project.
- Acquire specific and consistent information from many participants on key topics.
- Conduct interactive Focus Group Meetings (sessions) with 10–15 Conference participants to facilitate a deeper dive into several topics.

1. Coordinated with conference organizer(s) to explain the purpose of the outreach session and NCHRP Project 08-122, including the relevance of the project and its outcomes to the conference participants. This step was facilitated due to the fact that all three conferences had key people who also are members of the NCHRP Project 08-122 panel.
2. Numerous coordination contacts were conducted to effectively plan with each conference to take maximum advantage of each venue, options for space, and time slots that were still available.
3. Advertising for the events differed for each conference. For AMPO, staff was able to insert the event into the conference agenda in a prominent location, and the conference organizers provided advance lists of conference registrants that were used to develop a targeted invitation through EventBrite™ software. The NARC Conference was an executive director's meeting that achieved the highest attendance on record. The NARC participants were a "captive" audience since all attendees attended every session during the conference, including the NCHRP Project 08-122 session. Some participants were not affiliated with an MPO but with regional planning agencies.
4. Simultaneous with the arrangements for the three conferences being undertaken, a new social media platform was developed using the PublicInput.com platform. The principal purpose of the social media platform (at this stage of the project) was to create a "backup" system for gathering information from all conference participants as well as staff that might later fill out the survey. The PublicInput.com platform also allows for tracking separately sourced inputs, so that conference participants from AMPO and those from NARC received different URLs to link to the online survey. Finally, the PublicInput.com platform also allowed input from online participants and input received during the session from participants' cell phones.
5. A draft, paper-based survey was created that introduced the project and repeated the online questions (there were slight differences attributable to the timing of the events and finalizing of the survey instruments). These paper surveys were handed out during the conference events, not only to the participants of the NCHRP Project 08-122 session in each conference but were also made available to every participant regardless of whether or not they attended the session. Paper surveys were subsequently input individually into the PublicInput.com

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platform, again using a trackable system that could trace surveys and results back to the event where they were obtained. Additionally, both the zip code and MPO (or other organization) name were requested for each survey completed, whether online, during the NCHRP sessions, or on the paper survey.

6. Regarding the NCHRP sessions, all were facilitated by one of the two co-investigators (Thera Black at APTA and Scott Lane at AMPO and NARC). The APTA Conference took the form of a panel discussion, while the AMPO and NARC conferences employed the online survey taking and participant interactive features described in number 4 above.

The study review panel commented on the preliminary survey and methodological approach to engagement at the conferences. The survey questions were changed as a result of those comments to focus more on financing and engagement as well as numerous other changes. During the conference sessions, these topics were used to frame the discussion with participants, although they were encouraged to volunteer topics and bring up associated issues that were meaningful to them as the discussion evolved during each session.

American Public Transit Association

The initial meeting that is summarized was a collaboration with the American Public Transit Association (APTA) staff and the Metropolitan Planning Subcommittee moderator on a series of questions to frame the discussion for a panel of MPO-transit pairs convened to talk about successful partnerships in coordinated regional decision-making. This session informed two areas of relevance to the project.

1. Willingness to Collaborate between MPOs and transit agencies. The transit markets represented were primarily rail-based and large metropolitan areas. The Metropolitan Planning Subcommittee, which hosted this session, was favorable to including municipalities in its future membership (land-use authority, revenue generation, and infrastructure maintenance responsibilities were cited as reasons for inclusion). Additional parties, such as state departments of transportation, FHWA, FTA, and new mobility providers, are also important to future discussions.
2. Transit reporting and technological change. The other preliminary discussion was on creating longer-term transit reporting standards, from one to 20 years. Relevant to the project is that the motivation for this discussion stemmed in part from the need for existing standards to keep up with technological changes, balancing the frequency of reporting with the flexibility needed to adapt to these changes.

Transit and Metropolitan Planning Organizations: Partners in Regional Decision-Making was a moderated panel discussion featuring four pairs of MPO-transit agencies from different areas. The moderator was Lisa Kay Schweyer of Carnegie Mellon University, who brings both MPO and transit agency experience to her role as program manager for the Traffic21 Institute and the Mobility21 National University Transportation Center. The panel consisted of the following members.

- Alicia Brave – Miami-Dade Transit
- Eileen Bouele – Miami-Dade Transportation Planning Organization
- Grace Gallucci – Northeast Ohio Areawide Coordinating Agency
- Floun'say Caver – Greater Cleveland Regional Transit Authority
- James Carrington – Washington Metropolitan Area Transportation Authority
- John Swanson – Metropolitan Washington Council of Governments
- Holly Arnold – Maryland Transit Administration
- Todd Lang – Baltimore Metropolitan Council

Issues relevant to our research were developed in coordination with Rich Weaver and input provided by Ms. Schweyer and reviewed with the panel.

- Challenges to coordinated regional planning from the transit perspective;
- Disruptive technologies and how they are accommodated within the regional process;
- Long-range forecasting when the past is no predictor of the future; and
- Responsiveness of the regulatory framework as agencies adapt to emerging needs.

The format was for each pair of agencies to give a brief overview of their regions and working relationship to provide context before Ms. Schweyer began the facilitated question-and-response part of the agenda. Participants received the questions ahead of time. Mayor Oliver Gilbert of Miami Gardens was invited to join the panel on the dais and offer some opening remarks.

All the MPOs present represented large regions. They all emphasized that they plan for all modes of travel and work to incorporate land-use considerations in their plans. All spoke to the importance of coordination and collaboration with transit; of having transit "embedded" in the MPO process; and having interagency staff relationships in addition to policy level relationships. All four MPOs also spoke of the importance of having cities and counties at the table. This sentiment was echoed in the morning discussion, stressing that state and federal participation in the regional process is good and important but that it is even more important to engage municipalities. As one participant noted, transit agencies and MPOs have a natural affinity because, like MPOs, transit agencies typically transcend municipal boundaries, making them more "regional" in nature than municipalities yet totally dependent on them.

Association of Metropolitan Planning Organizations and National Association of Regional Councils

The flow for these two conference sessions is presented in the text box on this page with people being invited to participate through interactive question polling. In total, 105 completed responses were received from three sources—the National Association of Regional Councils (NARC) and the Association of Metropolitan Planning Organizations (AMPO) presentations and online participation. In both sessions, people were initially asked to prioritize the key challenge (topic) areas, they were then separated into breakout groups to identify at least five key words or short phrases that amplified the top-ranked challenges.

AMPO/NARC Session Flow

- Discuss findings of most-often-cited challenges to elaborate on the nature of those challenges by the focus group participants.
- Describe resource challenges, add and enhance from those shown on postcard/questionnaire.
- Describe partnerships in the MPO realms of work and how they have or will change going forward.
- Briefly describe how this project can best be of service to your MPO.

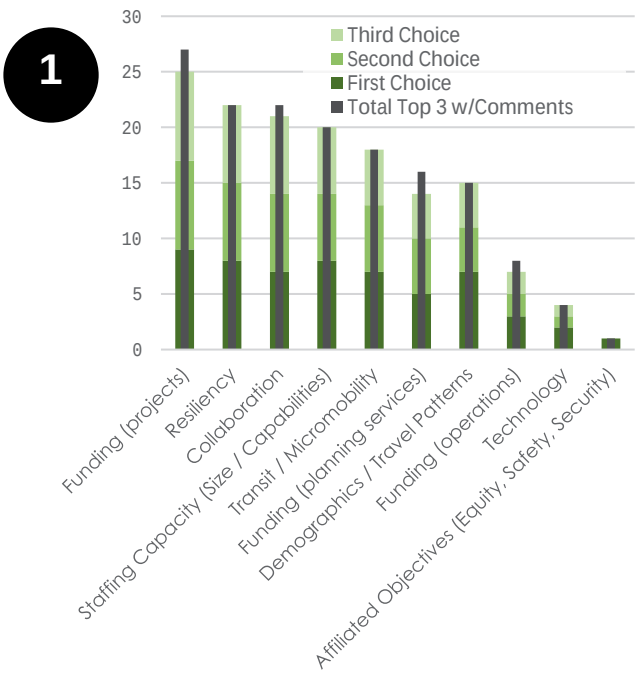
The summary in Figure D-1 includes the results of paper-based surveys and online survey response results received from participants at both conferences and those who participated online during and after the conferences.

Findings

The following represents the main findings from the conference engagement.

Innovation in the Face of Technological and Related Changes. While new technologies have the potential to help regions increase access and address congestion, there is general uncertainty about how to model that future or account for the effects of new technologies in the regional planning process and investment strategies. Transit services will become more customer-focused and integrated with other mobility services to create a seamless travel experience that is made possible by technology. Some participants noted that the ability of transit to smoothly integrate with new mobility options will depend in part on the ability of those programs and services to align with transit's commitment to ADA, Title VI, etc. The less accessible those new models are for all transit users, the harder it will be to integrate these new mobility options into a seamless and integrated transportation system.

Transit services will become more customer-focused and integrated with other mobility services to create a seamless travel experience that is made possible by technology.

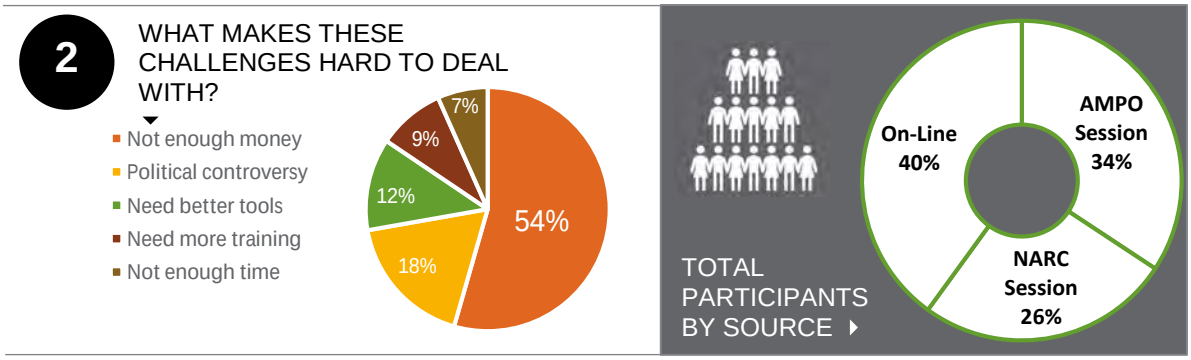


TOP THREE CHALLENGES FACING MPOS IN THE FUTURE

Chart 1: Funding sources for projects, followed by resiliency-related matters and collaboration with the public and partnering agencies, were the foremost choices for top challenges registered by participants at the conferences and in the online survey.

In Chart 1, the number of first, second, and third-choice responses are shown in the green-shaded columns. The total top-three responses received for each challenge is indicated by the dark gray column. This total includes responses from open-ended "other" comments received to this question if the "other" comment could be readily assigned to one topic.

The remaining two questions provide additional details on these challenges in Charts 2 and 3.



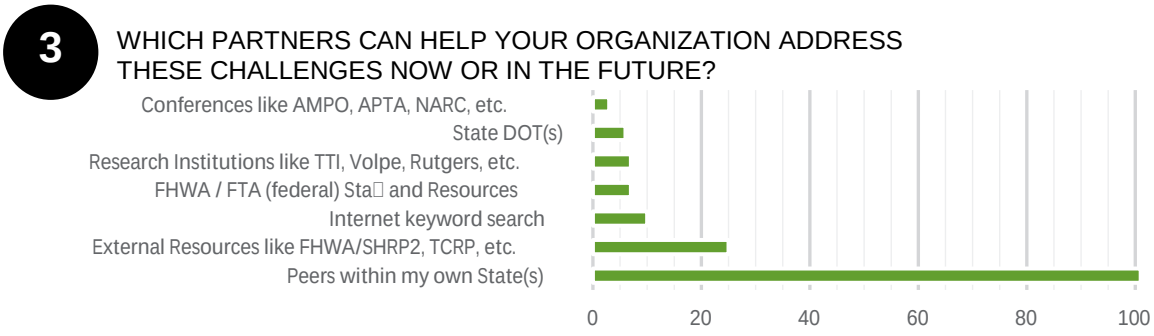


Figure D-1. Infographic summary of three conference survey questions.

Data and Data Sharing. Data sharing between MPOs and transit is a relatively recent phenomenon that has opened up new resources for modeling and data analysis. Transit agencies increasingly collect a wealth of travel characteristics through their automated data collection systems. MPOs need to work closely with transit agencies to understand data resources that are available and establish protocols and agreements for accessing important data. Data-sharing agreements with Transportation Network Companies (TNCs) can provide unparalleled trip-making data to support regional planning and transit service analysis. The key is negotiating for data sharing through the local agency contracts required for TNCs to operate within municipalities. Because data sharing is negotiated on an agency-by-agency basis, it is important that they are all onboard and work to obtain access to this information in the terms of the contracts.

Data remains critical: the current household travel survey in Baltimore reflects the region's interest in monitoring changes in household travel characteristics with the advent of new mobility options since the last survey. While changes will be incremental, MPOs need to pay particular attention to shifts taking place in their own regions. Communities within regions are playing regulatory catch-up with the new mobility options descending upon their communities. From Uber and Lyft to e-scooters, the private sector deploys the means and then government scrambles to figure out how to regulate new mobility to mitigate unintended impacts. MPOs and their partners need to think big and look ahead to the transformations on the horizons while at the same time respond to the immediate needs associated with recently deployed technologies.

MPOs need to consider new technologies and incorporate bold ideas into their long-range plans, but at the same time recognize that community values probably are not changing very much. People still care about access, equity, and fiscal responsibility even though the means of delivering mobility is changing tremendously. People still want walkable communities and want governments to use existing infrastructure and resources wisely. This may be a useful reminder going forward in the face of so much change that core principles are still valid in light of autonomous vehicles or other emerging concerns. Embracing these values may be a way of making sense of the changes and evaluating the roles that they will play in the future.

Role and Impact of New Mobility Partners. Among the large transit agencies at APTA there was a sense that new mobility partners while shaking things up, do not pose a grave threat to transit or the general order of things. Participants recognized that the very definition of "multimodal" is being redefined with the advent of shared mobility options like Lyft and Uber, e-scooters, and other e-devices, and that new mechanisms we have not yet considered will be deployed in the near future. One person compared TNCs to taxi cabs, and another added that they have helped to fill a shortage of taxis in that region. TNCs were described as partners in a "frictionless" customer-oriented transportation system, partners with particularly good technical capabilities. They will be a part of the mobility solution. The final roles are still evolving, and all expect more evolution in the transit-TNC relationship. It was noted by one participant that rideshare services make it possible for more and more people to live without a car. These are people who extensively use a variety of modes of travel, with some part of the time being transit. Attracting those people to transit is easier than attracting someone who owns a car to transit.

There was some pushback on the efficacy of new mobility playbooks in that TNCs have yet to present a sustainable funding model, and they do not have to meet the regulatory, Title VI, and security requirements of transit agencies. There is no incentive to serve disadvantaged populations, necessitating oversight on the part of government to ensure mobility benefits are fairly distributed. At the same time, TNCs are starting to come under pressure from their investors to turn a profit, raising questions as to what kinds of changes TNCs will make to their operating models in order to be profitable.

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Several participants spoke about the need for government to be an active partner to ensure congestion impacts do not outweigh mobility benefits and that all system users benefit from services. It was noted that Uber and Lyft each had to negotiate operating contracts with all of the individual municipalities in the Washington, DC, metro area because there is not a single overarching policy governing their operations. MWCOG was able to get the district itself to require data-sharing agreements in its terms of service for the TNCs. They were not as successful in obtaining agreements from the other municipalities in the region. MWCOG finds the travel data extremely helpful in understanding trip-making characteristics throughout the day.

MPOs and transit agencies may be able to look to the aviation industry for insights into how to plan for and accommodate future technology uncertainties and disruptions. The aviation industry has been working to test and incorporate highly and fully autonomous technologies into a system reliant on outdated technologies while developing protocols for working with new partners and protocols. They have been leaders in integrating emerging and disruptive technologies. Miami-Dade Metro is actively working to recruit transportation technology companies to the area to ensure that the region's residents have access to the widest array of travel options today and in the future. The region sees an economic benefit as well by demonstrating a forward-looking, technology-friendly attitude toward these new industries.

Finally, MPOs noted three coordinated conditions required for success: adaptability, flexibility, and integration. The rules of engagement have changed. There is no one answer to most questions, and if there is, it may be messy. But the cost of inaction is greater than the cost and risk of engagement, despite the uncertainties. Plans need to consider all options available today with the understanding that tomorrow there will be new options, and so MPO plans need to adapt and flex to provide useful direction while responding to these emerging options. Recognize that options currently available today and in the near future are actually test options: some current options will make it and others will not. MPOs need to work to integrate the most promising options into their transportation system plans and be ready for new ones.

Traditional Partnership Challenges. One of the topic areas was expressed directly by participants: as they face these transformational changes, what are the big challenges/opportunities they face as MPO-transit partners going forward into the 21st century? The definition of "region" is going to change, not because of transportation but because of economic and other forces. We will think of regions more like FHWA's megaregions, and so we will need to think about regional transportation in that same vein. The Northeast Ohio Areawide Coordinating Agency (NOACA) is actively studying the feasibility of a hyperloop from Cleveland to Chicago and has just added to that study a link to Pittsburgh. They are also looking at adding other links that connect this megaregion to others, such as links to Minneapolis, New York, and Washington, DC.

Public Transportation. The definition of traditional public transportation will also change. NOACA is looking at service types, such as commuter travel, personal travel, school travel, freight travel, as well as service times (e.g., Cleveland to Chicago in 30 minutes). They are also looking at how it would integrate with more traditional transit at either end, and how integrated fare structures would support connecting transit services (note: this perspective may also redefine "first-mile/last-mile" challenges). Setting an appropriate stage and level of expectations for future transit service is now paramount, particularly when thinking about the long-term future. Integrating connected and autonomous vehicles (AVs in particular) into current thinking and planning for transit has been and will continue to be a major challenge for the industry. Traditional concerns, such as declining ridership and maintenance, exacerbate the forward-facing challenges, too.

Meaningful and Mutually Rewarding Member Participation. Agreements are useful for formalizing understandings, funding strategies, data protocols, and more. Agreements can help establish appropriate land use and zoning in priority corridors when paired with a funding strategy

for corridor projects. All four MPOs at the APTA summit stressed that transit has full access to their funding programs, whether for vehicle purchase, studies and station area planning, or capital projects. The Capitol Region team talked about joint MPO/transit efforts to increase biking and walking. Benefits to the MWCOG are reduced VMT, more active travel, and support for walkable communities. Benefits to transit are a documented increase in ridership. They have collaborated to find effective ways to partner that increase biking and walking opportunities.

Plan Financing and Implementation. MPO investments into studies—corridor, bike/pedestrian, design, station area development, and other issues—help to advance project implementation while ensuring that there is consistency between study outcomes and regional plans. An example of implementation was provided by the Miami-Dade TPO, which flexes $75 million per year through 2023 and then $30 million per year for another 30 years to projects that support its designated mobility corridors. The TPO obtained approval from FHWA for MPOs to use CMAQ funds to finance Uber-style on-demand programs.

Regulation Adherence. Emerging technologies and conditions are changing too fast for rigid or inflexible structures to keep up. Regulatory systems and structures need to be less rigid and specific, more "nebulous," and speak to goals and intended outcomes instead of hard standards. Regulatory structures need to be more flexible so that government can better adapt and keep up with changes instead of always being so far behind and trying to catch up. When regulation is rigid and specific it becomes quickly outdated. The government needs to be nimble and responsive, and it needs a regulatory structure that allows that. Government cannot use the "go fast and break things" model employed by private technology companies driven by profit, but it must find its own ways to innovate. Government must always keep the people it serves at the forefront of its thinking. Some of those people have special needs that will not be profitable. Flexibility in the regulatory framework is needed, but it must put people front and center in its considerations.

Staffing Capacity and Capabilities. More people moving into an area equates to greater numbers and complexities of challenges. These increases in service areas or population have not translated into increases in staffing. One participant noted that the state department of transportation has not increased funding to MPOs to address changing requirements but has added staff. Other issues noted included succession planning in addition to clear communication generally and training boards and educating stakeholders in basic MPO processes specifically.

Changing Demographics and Travel Patterns. Participants noted that recreation preferences, housing/land use, and shifting agricultural populations have all presented challenges. Traditional thoughts about millennial populations may not always be true: a recent commute survey suggests that millennial rates of car ownership have gone up and continue going up with the acquisition of a home. Both older and millennial populations undergo changes in their life cycle that favor alternative mobility options that go beyond just Uber. The NARC summit participants noted (from their breakout tables) that generational differences, some of which are driving various kinds of land-use development, are key. An increasingly diverse population, including Hispanic populations, empty nesters, and aging populations, represent unique demographics that nevertheless share some of the same values and concerns about mobility options. Some of these changes have made traditional streams of funding for schools, revitalization efforts, and affordable housing options more problematic.

Financing of Projects or Operations. When asked, about one-third of the participants in the room said that they have trouble sometimes acquiring local matching funds for operational (federal) funds. The rules that are associated with the flows of funding can be confusing or changeable. One breakout table noted several practices that are noteworthy and some that are precautionary. One of the latter was a cut in motor licensing and fuels taxes that "gutted" local and

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state revenues. Transportation benefit districts and local funding for federal matches were cited as good practices, sometimes driven by necessity since state legislatures do not want to commit to funding local projects. The overarching theme of local and tribal limitations and declining state and federal funds are poorly understood and felt especially keenly in smaller jurisdictions, which find it almost impossible to get projects constructed. Others noted that resource-intensive industries leaving the area have left a funding and revenue gap in their wake. In Utah, MPOs have been able to exchange funds to better match federal funds, created by the passage of a state law that allows swapping 85 cents of local money to get one dollar of federal funds. One state department of transportation person present said that they (the state) are the middlemen dealing with insane federal rules but with a lot of responsibility to help local communities.

Internal (Staff) Challenges. The tables that dealt with collaboration cited multi-disciplinary staff, capacity-building (data and tools by staff), effective communication within and outside of the organization, and access to opportunities as key factors in bringing home a message to stakeholders. While there are considerably more new sources of data, learning how to use them and integrating them into existing practices are challenging. Finding a common ground within various groups, particularly between different generations of people, was challenging; a lack of two-way communication was also cited. One issue with the surfeit of data available today is that it is easy to "bludgeon" people with too much data in the planning process. Engaging people in a storytelling-type of involvement creates better communication channels, as does using visual information.

Resiliency and Sustainability. Climate change, sometimes associated with growing populations, was cited as a major issue in some (but not all or a majority) of MPOs/areas. The practice of resiliency planning is undergoing a major revolution, engaging infrastructure asset management and mitigation—often on political terms. Resiliency must become as comfortable a term as addressing congestion is now; currently, the topic is almost taboo. Using infrastructure management and asset control can help bridge that divide since when a bridge is washed out it gets attention. Related to resiliency in meaningful ways were terms brought up by breakout tables that included: sea-level rise, flooding, extreme weather events, erosion, greenhouse gas emissions, energy consumption, fires, and landslides. Challenges with addressing resiliency include political and polarizing viewpoints of the topic itself, sometimes leading to a lowest-common-denominator.

Ancillary Objectives (Equity, Safety, etc.). Standardized approaches and performance metrics for equity are rare and, if they do exist, may not work in a "one-size-fits-all" approach. Housing (including affordable housing relationships to equity), connecting transportation with land use, health-related quality-of-life issues, and getting people (including populations with traditional equity concerns) to participate in public processes that do not have a built-in "axe to grind." The NARC participants added that funding and policy silos and the lack of federal recognition of Councils of Government in law were barriers to achieving these objectives.

Accessibility (and Use) of Resource Tools. At the end of the session, Mr. Lane also asked what the participants would like to see in an online database or tool that can provide them with information that can serve as a resource to address these challenges. A couple of participants noted that either a new tool was not necessary and that no tool would obviate the need to conduct a broad (e.g., Google or similar) online search for information pertaining to any of the issues presented. There was a sense that other, existing online resources were not well known to the participants. While not a majority opinion, the need to update the information in any resource tool, as well as coordinating with existing online reference tools, did get agreement from participants. Having more search keys (e.g., "Is the state DOT collaborative or combative" was suggested) would be useful and serve to take the tool's utility beyond that of traditional search databases.

APPENDIX E

National MPO Survey Summary

Appendix E describes the major MPO survey work conducted in early to mid-2020. Following initial drafting, the project panel, NCHRP program officer, and consultant team internal reviews made positive changes to the question organization and wording. Input was initially solicited through a mailing list of 600 MPO contacts provided by PublicInput.com and was followed by notifications sent by the Association of Metropolitan Planning Organizations (AMPO) and the National Association of Regional Councils (NARC). The survey was originally scheduled to run through the end of March 2020, but was extended until July, permitting comparison of pre-pandemic and post-pandemic MPO responses.

Overview

As the pandemic response evolved, the project study team conducted a second round of outreach to MPOs that had not yet completed the survey by March 13, 2020. In all, over 300 MPOs were sent individual emails in this second round of outreach. This action (1) provided many additional survey responses, and (2) created an opportunity to see how the pre-pandemic responses might differ from those responses that were submitted after lockdowns began in March of 2020, including MPO offices. The general response rates from February to July of 2020 (when the survey was closed to responses) and the location of survey respondents are shown in Figure E-1.

Findings

The findings of the survey are summarized in Figure E-2. Note that there were 70 survey respondents before the COVID-19 lockdowns became prevalent (assumed date of March 14, 2020) and 59 "after" responses that occurred during the COVID-19 pandemic. Some responses did differ between these two time periods, particularly with respect to the importance of staff capacity (down from the second issue for pre-COVID-19 lockdown responses to fifth during the pandemic) and relationships with various partnering agencies like state departments of transportation, municipalities, and federal agencies became more important. Relationships with various partnering agencies were typically cited as a higher priority need in the future for those respondents that answered the survey during the COVID-19 crisis compared to those respondents that answered prior to the lockdown period.

Comments submitted by some participants helped to expand on key issues, such as staff retention and MPO resources and roles. The following comments have been slightly edited for clarity.

- Build a strong technical foundation in everything you do and do your best to stick to it; this is your ticket to rising and staying above the politics of planning. Always try to bring added value to address and solve challenges in your region. Always try to bring innovation to address

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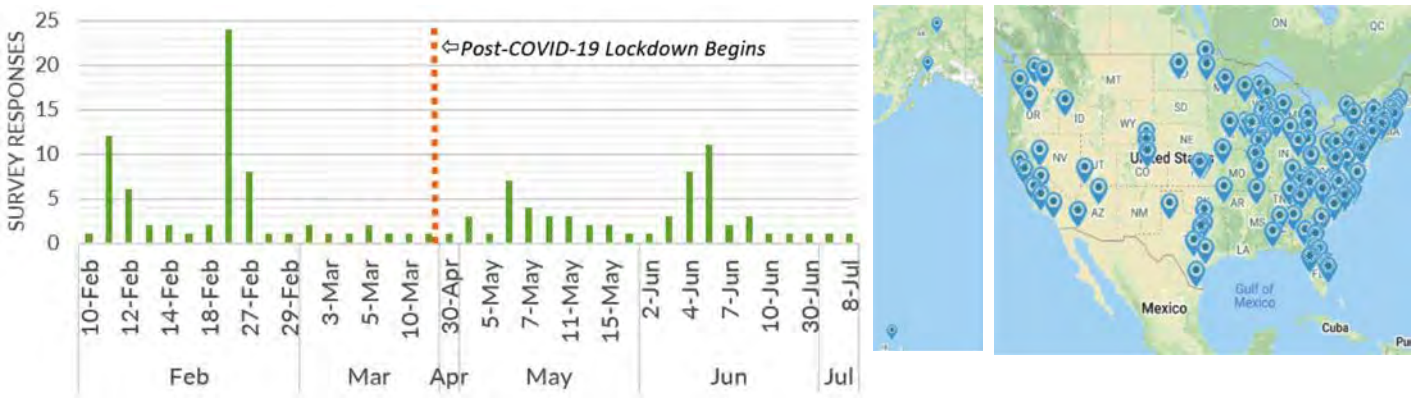

Figure E-1. Survey response rates and location of participants.

issues and solve challenges in your region. Always try to bring solutions to the table, not just problems. Take highly calculated risks when appropriate and warranted but be ready to handle the consequences regardless of the outcome. Be meaningful by earning your place at the table when regional decisions are being made. Look for opportunities to transfer your strengths and capabilities inherent to the MPO process to help address issues in your region that MPOs may not be traditionally involved in. Focus on attracting, training, compensating, and retaining smart, passionate employees who know how to get things done. Get in the game with regard to technology and data as it is our future. Do not turn away opportunities when being asked to be part of the solution. Good products generate good relationships with funding partners that create long-term, sustainable funding opportunities. Build relationships with all of your partners based on trust, respect, and appreciation, which are the foundation of communication. Communication in everything we do is our biggest challenge and when accomplished will provide for our biggest accomplishments.

- Build positive relationships with as many external stakeholders as you possibly can. It may sound silly, but "please" and "thank you" can make miracles happen—even given rigid state and federal regulatory frameworks.
- Training that has follow-up technical assistance.
- It always comes down to personal relationships. The MPO needs to be seen as a facilitator and not a referee.
- Monitor discrepancy in planned financial forecasts and actual programming.
- Just work more without expectation of reward or acknowledgment.
- MPOs have not only put all plans and studies on the Web site but also tons of detailed performance-related data such as traffic counts, travel time, congestion levels, transit measures, and system measures (e.g., VMT).
- Hiring the right people and treating them well is especially important. Also, focusing resources and attention on where they are needed is an art, but it is the art that can make your organization both highly effective and widely appreciated by your members, stakeholder agencies, and community.
- Meet the requirement of the federal and state (funders) relationships because you need to, but that doesn't leave much for the development of local relationships.
- More affordable places or preferred places to live are in suburban or rural areas that are auto-centric creating transportation challenges of either available public transport or increasing traffic from single-occupancy vehicles. Within the project evaluation process, points are given to projects that aid in providing transportation options in areas where land-use policies are supportive of the multimodal transportation system. The criteria for this [are] currently not ideal and staff is analyzing how it could be improved.

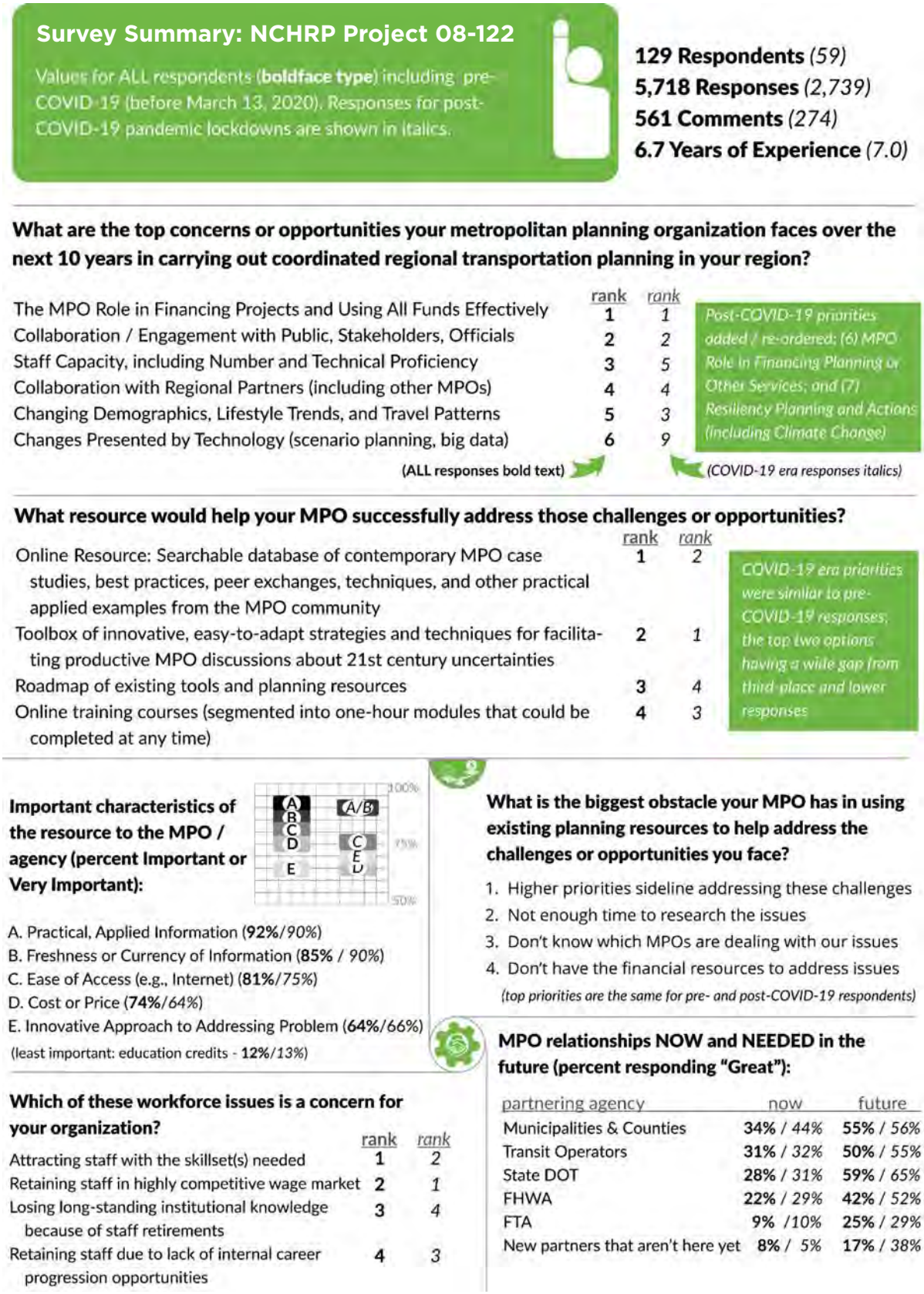

Figure E-2. Survey summary.

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- We are a small metro area 50 miles from a major metro area and have difficulty attracting and keeping employees due to wages and workloads. Our small staff is stretched to meet all requirements.
- Goal setting *must* be a priority. We have one as part of the process of developing our most recent UPWP.
- The Charlotte Regional Transportation Planning Office has traditionally been understaffed regarding staff members devoted 100% to MPO activities. The model used in Charlotte was to rely upon the Charlotte Dept. of Transportation for ad hoc staff support, as well as on subcommittees, task forces, etc. The increasing complexity of the MPO process began to render this model outdated at least five years ago. Our approach to changing the model is best described as "gradualism." We did not approach the policy board and lead planning agency with a plan to immediately double or triple staff size. Instead, with each fiscal year budgeting process, we built a case for why an additional position was needed. In each case, the new position was approved. Gradualism allowed us to get the new positions and provide improved service to the member jurisdictions, but without the sticker shock of bringing in a substantial number of new staff during one fiscal year.
- Private sector providers of Mobility as a Service are negotiating directly with local governments for access to markets and not sharing data. Somehow we will need better relationships with them so that cumulative impacts can be assessed and included in future forecasts/modeling.
- Since our MPO is a small division within a larger county planning department, we can rely on our host agency to leverage its tangible resources (e.g., GIS databases, IT development, and site plan reviews) and intangible resources (e.g., the authority of county government) to promote MPO plans and initiatives.
- We have full-time legislative liaisons.
- We are a small (staffing and population) but rapidly growing MPO. Partnerships have been essential and critical to our success. A few examples include 1) jointly coordinating and funding the MPO plan update with a city transportation plan update; 2) utilizing some discretionary MPO funding (STBG) to partially fund external planning projects (e.g., highway corridor plan, transit plan, ITS plan); 3) using the MPO committees as the technical and policy oversight committees for external projects (e.g., state DOT planning projects); and 4) using Surface Transportation Block Grant funding to increase staffing levels—this required extensive work with our board.
- We try to engage or gain support from as many relevant stakeholders as possible.
- Communication and having good processes [are] particularly important. Giving staff responsibility and accountability is essential.
- The most effective method that we have found in recent years in working around limitations of time and resources is to collaborate and share work on common tasks with other MPOs in the state. We have cooperatively tackled the implementation of performance-based planning and the project selection process and criteria by sharing work among the four MPOs.
- We recently transitioned our MPO from a city-hosted agency to an independent, non-profit organization, and it has been a great success in reducing conflicts of interest and control and enabled us to pursue our own federal grants.
- Work closely with DOT and local governments to ensure projects are delivered and on time.
- Peer partners program: 1) establishing an exchange between those serving in similar roles to enable discussion and feedback; 2) peer exchange. I would love an opportunity to travel to several other MPOs and meet with my peers to discuss how they do things.
- Although guided by state laws, I have *not* found a simple explanation of what should be in a request for proposals (RFP), or how does an RFP differ from a request for qualifications (RFQ). For example, our MPO releases two to three RFPs/RFQs per year, but we have recently been told, by our FHWA partners, that RFQs are no longer to be used *except* for contracts that focus on highway design. The normal procedure is to take the most recent RFP and use it as

a basis for the next document. That is a procedure fraught with problems and likely to miss a lot of the details needed.

The following pages describe the complete survey. Note that some very minor changes occurred transitioning from written to digital form.

Thank you for participating in the MPO Strategies for Future Success survey. The results will be used in the NCHRP 08-122 study currently happening now, helping direct the research team to create a useful resource for addressing issues your MPO is facing or will face in the near future. Please take the next few minutes to tell us about the primary challenges facing your MPO as it works to respond to apply the 3C planning process in the 21st century. Please contact jslane@metroanalytics.com for additional support and information.

Please tell us a little about yourself and your organization.

Please tell us your MPO's Name:	MPO Name
Please tell us your name and position title with the MPO:	Your name and title
How many years have you worked in this position?	Years in current

1. **What are the top concerns or opportunities your metropolitan planning organization faces over the next 10 years in carrying out coordinated regional transportation planning in your region?** *(rank order)*
   - __ Changes presented by Technology (scenario planning, big data)
   - __ Changing Demographics, Lifestyle Trends, and Travel Patterns
   - __ Freight Impacts (including effects of e-Commerce)
   - __ Resiliency Planning and Actions (including climate change)
   - __ The MPO Role in Financing Projects and Using All Funds Effectively
   - __ Emerging MPO Roles in Transit (incl. new technology & services)
   - __ Staff Capacity, including Number and Technical Proficiency
   - __ The MPO Role in Financing Planning or Other Services / Operations
   - __ Responding to "IoT," On-Demand Services, Micromobility
   - __ Supporting Affiliated Objectives, like Safety, Security, Economy, Equity
   - __ Collaboration / Engagement with Public, Stakeholders, Officials
   - __ Collaboration in Large Regions (including learning from other MPOs)

2. **Is there a topic or issue that your MPO is facing that should have been on this list? If so, please briefly type a description of that issue or concern.** *(Typed Response)*

   Enter issue(s) important to you and your MPO that aren't listed above.

3. **What resource(s) would help your MPO successfully address those challenges or opportunities?** *(Choose any of the following responses that apply)*
   - ☐ Online Resource: Searchable database of contemporary MPO case studies, best practices, peer exchanges, techniques, and other practical applied examples from the MPO community
   - ☐ Online Resource: Searchable database of academic resources and published research
   - ☐ Roadmap of existing tools and planning resources

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- ☐ Toolbox of innovative, easy-to-adapt strategies and techniques for facilitating productive MPO discussions about 21st-century uncertainties
- ☐ On-site or telephone technical assistance team similar to TPCB, TMIP, and NTI opportunities
- ☐ In-person training and professional development opportunities
- ☐ Online training and professional development opportunities
- ☐ In-person training courses (two to three days in length)
- ☐ Online training courses (segmented into one-hour modules that could be completed at any time)
- ☐ Regional conferences within a comfortable drive
- ☐ National conferences that require overnight stays

4. **How important are these characteristics in determining the usefulness of a resource for your organization?** *(Evaluate each: 1 = Critically Important; 5 = Not Important)*

Resource Tool Characteristic	*More Important ▸ Less Important*
Cost	○ ○ ○ ○ ○
Ease of access (internet-based, flexible scheduling)	○ ○ ○ ○ ○
Opportunity for continuing education credits	○ ○ ○ ○ ○
Duration (how long it takes to use the resource)	○ ○ ○ ○ ○
"Freshness" and currency of the information	○ ○ ○ ○ ○
Practical, applied technique or information	○ ○ ○ ○ ○
Innovative approach	○ ○ ○ ○ ○
Ability to screen sources by key MPO characteristics	○ ○ ○ ○ ○
Something else: Type in other internal issues	○ ○ ○ ○ ○

5. **What is the biggest obstacle your MPO has in using existing planning resources to help address the challenges or opportunities you face?** *(Choose one)*

- ○ Not enough time to research the issues
- ○ Higher priorities sideline this effort
- ○ We don't understand the issues and aren't sure where to begin
- ○ These are not yet policy maker concerns
- ○ We're not aware of what resources are already available or how to access them
- ○ We don't know who to ask for help
- ○ We don't know what other MPOs are dealing with our same issues or opportunities
- ○ Available resources aren't relevant to my region or our needs
- ○ We don't have the financial resources to start addressing these issues
- ○ Something else: Type in other internal issues

6. **Which of these workforce issues is a concern for your organization? (check all that apply)**

- ○ Losing long-standing institutional knowledge through staff retirements
- ○ Losing well-trained staff to private or public agency poaching/recruiting efforts
- ○ Attracting staff with the skillset needed for our organization
- ○ Attracting staff that reflect the diversity of our region

- ○ Retaining staff in a highly competitive wage market
- ○ Retaining staff due to lack of internal career progression opportunities
- ○ Retaining staff due to unrealistic expectations of MPO roles and responsibilities
- ○ Training existing staff to take on new skills and areas of expertise
- ○ Integrating older and younger staff into cohesive teams
- ○ MPO staff are primarily focused on managing consulting contracts
- ○ We have not had issues with attracting or retaining staff
- ○ Other: Type in other workforce issues

7. Please explain a recent example that illustrates how your organization was impacted by a workforce issue and any measures you may have employed to address it *(if applicable)*.

Enter issue(s) important to you and your MPO that aren't listed above.

8. What organizational conditions are factors in your ability to respond to emerging MPO needs? *(Choose any of the following responses that apply)*

- ☐ Funding constraints
- ☐ Staffing constraints
- ☐ Regulatory constraints
- ☐ Political constraints
- ☐ Technical constraints
- ☐ Public opinion
- ☐ Competing priorities
- ☐ Governance structure
- ☐ Something else: Type in other organizational concerns.

9. MPOs work with many different types of organizations. Some are long-running relationships and others are new or just emerging. How effective and useful are your MPO's relationships NOW, and how effective are they NEEDED to be over the next five years. *(Choose from each column: 1 = GREAT; 5 = NEEDS IMPROVEMENT)*

PARTNER	RELATIONSHIP **NOW**					RELATIONSHIP **NEEDED**				
Municipalities and Counties	○	○	○	○	○	○	○	○	○	○
Transit Operators	○	○	○	○	○	○	○	○	○	○
State Department of Transportation	○	○	○	○	○	○	○	○	○	○
FHWA	○	○	○	○	○	○	○	○	○	○
FTA	○	○	○	○	○	○	○	○	○	○
Human-Services Transportation Providers	○	○	○	○	○	○	○	○	○	○
New Partners that aren't Here Yet	○	○	○	○	○	○	○	○	○	○
Non-Profit Partners	○	○	○	○	○	○	○	○	○	○
Private Sector Partners	○	○	○	○	○	○	○	○	○	○
Community-based Organizations	○	○	○	○	○	○	○	○	○	○
Other Partner: Type in Partner Agency	○	○	○	○	○	○	○	○	○	○

10. **MPOs have many current demands on their time and resources. In this final question, feel free to offer advice to other MPOs on how your agency has successfully addressed challenges inside local, state, and/or federal legal frameworks.** *(Typed Response)*

Describe specific requirements that hinder your MPO's ability to address the challenges you've identified in this survey.

APPENDIX F

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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
TDC	Transit Development Corporation
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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