



# Transportation Planning Capacity Building Program

## New York Metropolitan Transportation Council Scenario Planning Workshop

***Sponsored by the Federal Highway  
Administration***

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Delaware Valley Regional Planning Commission  
Metropolitan Transportation Commission

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6. AUTHOR(S) Rachel Strauss				
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## Introduction

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This report documents a two-day scenario planning workshop held July 14-15, 2015, in New York, New York, and hosted by the New York Metropolitan Transportation Council. The Federal Highway Administration (FHWA) sponsored this workshop under its Scenario Planning Program, which is run jointly with the Federal Transit Administration (FTA). The Scenario Planning Program is also part of the FHWA-FTA Transportation Planning Capacity Building Program.

## Executive Summary

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This report documents a two-day scenario planning workshop held July 14-15, 2015, in New York, New York, and hosted by the New York Metropolitan Transportation Council (NYMTC). The Federal Highway Administration (FHWA) sponsored this workshop under its Scenario Planning Program, which is run jointly with the Federal Transit Administration (FTA). The Scenario Planning Program is also part of the FHWA-FTA Transportation Planning Capacity Building Program.

The workshop introduced the topic of financial scenario planning to NYMTC staff and representatives from local, State, and Federal agencies. Approximately 60 participants attended; see [Appendix B](#) for a list of workshop participants.

NYMTC serves as the metropolitan planning organization (MPO) for the New York City metropolitan area, including New York City, Long Island, and the lower Hudson Valley. NYMTC's planning region extends across 2,440 square miles and supports 12.4 million residents, approximately 64 percent of New York State's population based on 2010 United States Census data.

NYMTC is currently updating its regional transportation plan (RTP), which is anticipated for adoption in 2017. As part of this update, NYMTC is interested in developing financial scenarios and forecasts to support the RTP. NYMTC requested the FHWA-sponsored workshop to learn more about financial scenario planning and to gain insights from peer agencies about best practices when developing and applying financial scenarios.

During the workshop, NYMTC staff shared information on the current RTP, *Plan 2040*, and its components, including current and future trends and needs. This information helped frame the later break-out group discussions, as participants discussed potential challenges and opportunities for the NYMTC planning region in creating and applying financial scenarios.

Three peer experts also participated in the workshop to share their agencies' experiences and perspectives in using financial scenario planning:

- Michael Boyer, Manager, Office of Long-Range Planning and Economic Coordination, Delaware Valley Regional Planning Commission (DVRPC);
- Ken Kirkey, Director, Planning, Metropolitan Transportation Commission (MTC); and
- Elizabeth Schuh, Principal Policy Analyst, Chicago Metropolitan Agency for Planning (CMAP).

The peers focused on how they have used risk-based planning in the scenario planning process and how they have dealt with uncertainties and unknowns in scenario development. Key themes that emerged from the peers' presentations included:

- Financial scenario planning involves addressing a range of uncertainties and trade-offs.
- Identifying "drivers of change" can help drive scenario development.
- Financial scenario planning is a useful, flexible tool that may differ in its use, as it often depends on an agency's staff capacity and available resources.

On the second day of the workshop, participants focused on best practices and next steps for NYMTC, as it considers how to integrate financial scenario planning into the activities for its next RTP update. Roundtable discussions with the peers, NYMTC, FHWA, and FTA staff allowed for information-sharing and lessons learned on these topics.

The workshop provided an opportunity for NYMTC and its partners to learn about financial scenario planning and how it can enhance RTP activities. Post-workshop evaluations submitted by participants indicated that their knowledge of financial scenario planning grew as a result of the workshop and that they found value in the workshop content and peer presentations.

## Overview of the Workshop

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### Goals of the Workshop

The NYMTC scenario planning workshop focused on best practices for scenario planning, particularly financial scenarios, to build awareness and encourage information-sharing among NYMTC, its members, neighboring MPOs, and the peer agencies. The goal of the workshop was to establish a series of guideposts for NYMTC in developing financial scenarios.

As NYMTC is relatively new to financial scenario planning, the workshop provided an opportunity to share information and learn from three peer agencies on this topic. Workshop participants also participated in a “courses of action” exercise in which they identified opportunities and a preliminary framework for developing and using financial scenarios in the future for the NYMTC planning region.

### Selecting the Peers

In advance of the event, the workshop planning team worked to identify MPOs that could serve as peers during the workshop and share their perspectives on financial scenario planning. Peers were selected based on their experience in using risk-based planning in the scenario planning process, developing financial scenarios and analyses, and dealing with uncertainties and unknowns in scenario development. In addition, peers were chosen based on their similarities to NYMTC and its planning region. Based on these criteria, the workshop planning team extended invitations to three MPO representatives to participate as peers:

- Michael Boyer, Manager, Office of Long-Range Planning and Economic Coordination, DVRPC;
- Ken Kirkey, Director, Planning, MTC; and
- Elizabeth Schuh, Principal Policy Analyst, CMAP;

Contact information for each of the peer representatives is included in [Appendix A](#) of this report.

### Format of the Event

NYMTC hosted the two-day workshop at its offices in New York, New York, on July 14-15, 2015. The three peer presenters, NYMTC staff, FHWA and FTA staff, and representatives from other local MPOs and transportation agencies attended the workshop. A full list of attendees is available in [Appendix B](#) of this report.

The workshop incorporated panel sessions and presentations with interactive break-out group discussions. Participants were divided into six groups that represented a mix of the agencies present at the event.

During the morning of Day One, NYMTC, FHWA, and FTA offered opening remarks, and FHWA and NYMTC provided scenario planning perspectives at the Federal and regional levels. The peers provided context on their agencies’ financial scenario planning activities, and workshop participants worked in small groups to identify potential challenges facing the NYMTC region in developing financial scenarios.

In the afternoon of Day One, the break-out groups first summarized their morning discussions. The peers then described their experiences in dealing with uncertainties and unknowns in scenario development. Following the second peers’ session, workshop participants again met in their small groups to discuss next steps and opportunities for NYMTC when engaging in financial scenario planning.

On Day Two, a smaller group consisting of the peers and NYMTC, FHWA, and FTA staff convened to hold follow-up technical discussions on financial scenario planning. Participants focused on best practices for financial scenario planning and began to identify more concrete next steps that NYMTC could potentially use going forward for the financial scenario planning portion of its RTP update. The agenda for the workshop is provided in [Appendix C](#) of this report.

## Introduction

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### NYMTC Background

NYMTC is the MPO for the New York City metropolitan area, including New York City, Long Island, and the lower Hudson Valley. The region covers 2,440 square miles, 10 counties, and is home to 12.4 million residents, approximately 64 percent of New York State's population based on 2010 United States census data (Figure 1).<sup>1</sup>

Since its inception as the MPO for the region in 1982, NYMTC regularly collaborates with planning partners to address transportation-planning issues at the regional level, coordinates on studies for transportation improvements and decisions for using Federal transportation funding, and pools available resources to support future transportation infrastructure and development needs. To accommodate the region's needs at a more local level, NYMTC's institutional structure divides into three branches known as Transportation Coordinating Committees (TCC): the New York City TCC, Mid-Hudson South TCC, and Nassau / Suffolk TCC. The TCCs provide input on the sub-regional transportation priorities and focus on more localized issues as part of the local planning processes in these areas.



**Figure 1: The NYMTC planning region covers 10 counties across New York City, Long Island, and the lower Hudson Valley.**

Source: NYMTC

In September 2013, NYMTC's 2014-2040 RTP, *Plan 2040: A Shared Vision for a Sustainable Future*, was adopted. *Plan 2040* presents a vision for the region, developed through public engagement activities and coordination with NYMTC members.<sup>2</sup> This vision focuses on maintaining and improving the region's transportation network, including roads; bridges; and freight, transit, bicycle, and pedestrian facilities. To determine strategies for infrastructure investments, the plan relies on a variety of forecasts—from demographics to jobs to housing—to assess the region's future growth and identify opportunity areas.

In starting the update to its next RTP, anticipated for adoption in 2017, NYMTC seeks to use a financial scenario planning approach, particularly in demonstrating the impacts of different types or amounts of investments. The FHWA scenario planning workshop allowed NYMTC to gain a stronger understanding of financial scenario planning and how this type of scenario planning can be used to support RTP forecasts and updates.

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<sup>1</sup> For more information, please visit the NYMTC website: <http://www.nymtc.org/>. The 10 counties in the NYMTC planning region are: Bronx, Kings, Manhattan, Nassau, Putnam, Queens, Rockland, Staten Island, Suffolk, and Westchester.

<sup>2</sup> NYMTC members include 9 principal voting members and 7 advisory non-voting members. The principals are: the County Executives of Nassau, Putnam, Rockland, Suffolk, and Westchester counties; Chief Executive Officer of the Metropolitan Transportation Authority; Director of the New York City Department of City Planning; Commissioner of the New York City Department of Transportation; and Commissioner of the New York State Department of Transportation. The advisory members are: Port Authority of New York and New Jersey; New York State Department of Environmental Conservation; New Jersey Transit; North Jersey Transportation Planning Authority; FHWA; FTA; and the U.S. Environmental Protection Agency.



## What are Scenario Planning and Financial Scenario Planning?

**Scenario planning** is a process that transportation agencies can use to assess and prepare for possible conditions using multiple plausible stories about the future. Originally used in a military context in the 1960s, businesses, government, and nongovernment agencies today use scenario planning to facilitate a common understanding of values and evaluate how these values relate to factors affecting transportation, such as demographics, land use patterns, economic development, and technological advances. The development of scenarios can help a community plan strategically for its future and determine the allocation of future investments. Scenario planning is an enhancement of, not a replacement for, the traditional transportation planning process and can be adapted to fit different purposes, scales, and areas. Scenario planning from its earliest stages through implementation typically takes approximately 12 to 36 months.

**Financial scenario planning** focuses on a specific component of scenario planning, addressing how transportation agencies can develop investment scenarios as part of long-range transportation plans (LRTPs). These investment scenarios often demonstrate “reasonable” and “not reasonable” revenue forecast assumptions.<sup>3</sup>

Financial scenario planning ties in closely with fiscal constraint and financial planning for transportation projects. For example, transportation agencies may consider different discount rates to value uncertainties, unit cost estimates (e.g., cost per hour, cost per passenger, cost per passenger mile), and operations and maintenance (O&M) costs for transportation facilities when developing the financial scenarios. Transportation agencies can then use these scenarios to identify trade-offs and begin discussions about how the trade-offs might impact future investments.

Data for the outer years of the LRTP (i.e., beyond the first 10 years) is oftentimes more difficult to estimate based on the greater level of uncertainty. In some cases, transportation agencies may use “cost bands” to aggregate costs and better estimate future costs and funding needs.<sup>4</sup> The use of “cost bands” can help convey the uncertainty of a particular estimate and demonstrate the variability built into the cost.

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<sup>3</sup> Per FHWA's "Financial Planning and Fiscal Constraint for Transportation Plans and Programs: Questions and Answers," "determining whether a future funding source is 'reasonable' requires a judgment decision. Two important considerations in determining whether an assumption is 'reasonable' are: (a) evidence of review and support of the new revenue assumption by State and local officials and (b) documentation of the rationale and procedural steps to be taken with milestone dates for securing funds." For more information, please visit: [http://www.fhwa.dot.gov/planning/guidfinconstr\\_ga.cfm](http://www.fhwa.dot.gov/planning/guidfinconstr_ga.cfm)

<sup>4</sup> FHWA's "Financial Planning and Fiscal Constraint for Transportation Plans and Programs: Questions and Answers."

## Presentation and Discussion Highlights

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### Welcome and Introduction

NYMTC, FHWA, and FTA representatives provided introductory remarks and welcomed participants to the workshop. Brian Betlyon, Metropolitan Planner with the FHWA Resource Center, facilitated the event.

Gerry Bogacz, NYMTC Planning Director; Karen Rosenberger, Intermodal Transportation Planner of the FHWA New York Division; and Tyrhonda Edwards, Community Planner of FTA Region 2, each offered remarks, thanking the peers for their participation and noting the benefits of scenario planning and how the workshop's activities would help encourage information-sharing and lessons learned on financial scenario planning.

### Scenario Planning Perspectives

Mr. Betlyon and Mr. Bogacz discussed scenario planning perspectives at the Federal and regional levels. The Federal presentation provided a general overview of scenario planning and its various connections to integrated planning, performance-based planning and programming (PBPP), and financial scenario planning. Mr. Bogacz then presented on NYMTC's *Plan 2040* efforts and related activities.

#### *Federal Perspectives*

Scenario planning helps transportation agencies create multiple plausible stories about what the future could be. Through the scenario planning process, agencies can build a common understanding of the issues and driving forces of change that affect transportation. The scenarios created can also help assess and prepare for possible future conditions.

The "traditional" scenario planning process typically integrates transportation and land use planning. Similar to visioning and alternatives analyses, scenario planning allows agencies to ask "what if," compare and assess future likely land uses, and examine the interactions between multiple factors and trends.

Mr. Betlyon focused on the many connections scenario planning has, particularly to integrated planning, PBPP, and financial scenario planning.

- *Integrated planning:* Scenario planning can help agencies and stakeholders compare transportation choices and consequences, allowing for better, more informed decisions. It can also promote greater interest from a broader set of the population by engaging stakeholders in the process of creating and evaluating alternative futures.
- *PBPP:* In connecting to PBPP, FHWA has seen a growing trend in the use of performance measures and indicators to evaluate scenarios. Using these indicators allows agencies to develop more robust scenarios and to share information with stakeholders and decisionmakers about the differences between scenarios and tradeoffs.
- *Financial Scenario Planning:* Financial scenario planning connects risk-based planning, investment trade-offs, and long-range planning. Through financial scenario planning, agencies develop scenarios to test different futures using a range of inputs.

Lastly, Mr. Betlyon shared information on the language referencing scenario planning in the Moving Ahead for Progress in the 21st Century (MAP-21) Act. MAP-21 includes language that provides the option for MPOs to use scenario planning.<sup>5</sup> Under MAP-21, when applying a scenario planning approach, MPOs should consider components such as regional investment strategies, population, and employment; revenue constrained scenarios; and the estimated costs and potential revenues available to support each scenario.

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<sup>5</sup> Information about MAP-21 is available at: [www.fhwa.dot.gov/map21/](http://www.fhwa.dot.gov/map21/).

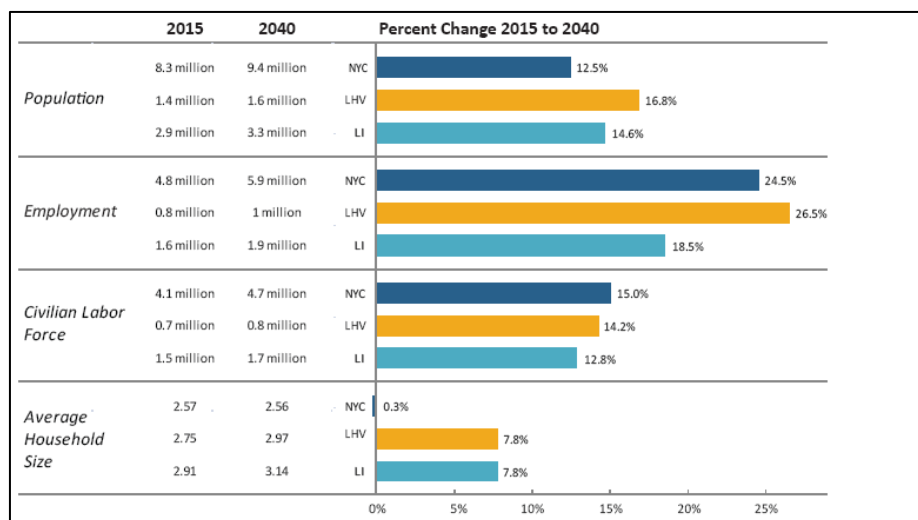
## NYMTC Perspectives

NYMTC's *Plan 2040*, adopted in 2013, focuses on the region's current and future trends, establishes regional strategic goals, and provides a framework for strategic transportation initiatives and investments.

*Plan 2040* includes several forecasts and key assumptions. The forecasts, which extend through 2050, provide a foundation for the plan and address both current and future demand and needs, including population, employment, labor force, households, and travel (e.g., freight, congestion, safety) demands, and needs for infrastructure and resources. Additional assumptions under *Plan 2040* address resiliency and climate adaptation, fuel prices and consumption, clean energy for vehicles, technology changes, globalization and security, transportation and public health, and the connections among transportation, housing, and jobs.

Mr. Bogacz noted that one of the challenges NYMTC faces is the large size of its planning region and the enormity of its transportation network. Despite this challenge, the New York region has a relatively low vehicle-miles traveled (VMT) per capita figure when compared to other U.S. metropolitan areas, particularly given its extensive transit network.<sup>6</sup>

NYMTC is also forecasting a growing region (Figure 2). Population and employment will significantly expand in the future, and transit travel in suburban areas is anticipated to increase. Mr. Bogacz discussed that, in analyzing the forecasts, NYMTC is thinking about how the existing transportation systems can accommodate the expected growth and how improvements can be funded, as vehicular and transit congestion are already concerns today.



**Figure 2: NYMTC forecasts show that the region will continue to grow in the future, with numbers of total daily trips (both auto and transit) and daily VMT and vehicle-hours of travel increasing.**

Source: NYMTC

As part of *Plan 2040*, NYMTC also coordinated with its stakeholders and members to establish strategic goals. The goals inform desired outcomes, land use designations, and strategic transportation initiatives and investments. The *Plan 2040* goals are to:

- Enhance the regional environment.
- Improve the regional economy.
- Improve the regional quality of life.
- Provide a convenient, flexible, and resilient transportation system within the region.
- Enhance the safety and security of the transportation system for both motorized and non-motorized users.
- Build the case for obtaining resources to implement regional investments.
- Improve the resiliency of the regional transportation system.

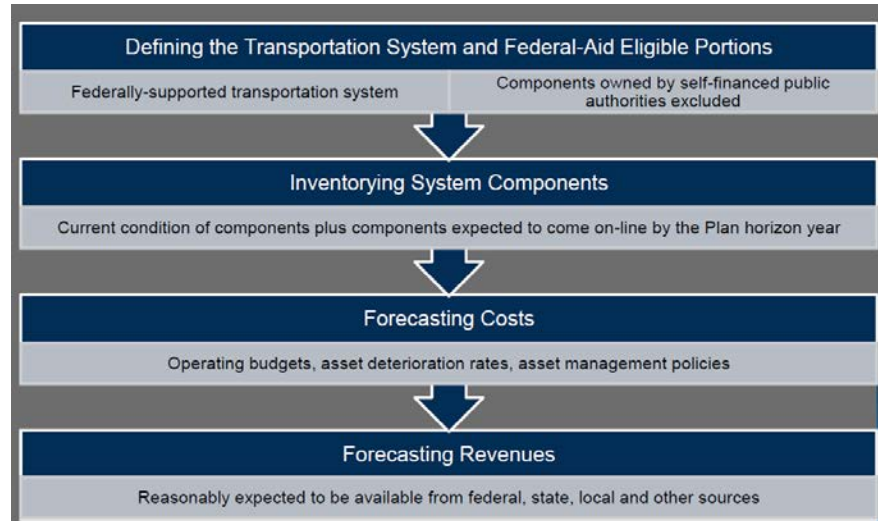
<sup>6</sup> As of 2014, NYMTC's daily VMT/capita was 15.7. Other cities referenced during the workshop during NYMTC's presentation were Chicago (13.3), Philadelphia (14.9), and San Francisco (20.1) (all numbers as of 2011). Information for the peer cities was taken from the Texas A&M Transportation Institute, *2012 Urban Mobility Report*.

Using the goals, NYMTC worked with its stakeholders to designate land uses, focusing on proposed projects that linked directly to specific development projects, development opportunities near transit, and sustainable development areas, which included members' desired growth and local growth areas, planned proposals or studies, and areas of expected land uses to promote sustainable residential and commercial growth.

NYMTC's focus on transportation investments also comes through in *Plan 2040*. The plan divides investments into four categories related to: 1) planning initiatives, 2) project planning and/or environmental assessments for vision projects, 3) programmed improvement projects over the next five years, and 4) programmed improvement projects beyond the next five years. Each of the categories emphasizes actions to preserve, enhance, and grow the transportation system.

To support these transportation investments, *Plan 2040* uses a fiscally constrained approach.<sup>7</sup> The plan evaluates the

anticipated costs (e.g., relating to O&M, system preservation, system enhancements) and revenues (e.g., Federal, State, local) to develop financial forecasts. NYMTC's financial forecasting approach for *Plan 2040* defines the transportation system and Federal-aid eligible portions, inventories system components, forecasts costs, and finally, forecasts revenues (Figure 3).



**Figure 3: NYMTC's financial forecasting under *Plan 2040* involved the four key steps shown here.**

Source: NYMTC

Mr. Bogacz discussed several of the key assumptions built into the financial forecasts. For example, forecasted costs are based on the operating budgets of member agencies, while forecasted revenues assume local tax receipts, user fees, and budget allocations. NYMTC also coordinated with its members to forecast asset management and calculate year-of-expenditure (YOE) dollars using local inflation rates or a 3 percent default rate.<sup>8</sup> To forecast system enhancements, NYMTC used project costs as defined in *Plan 2040* or its 2014-2018 Transportation Improvement Program (TIP). A strong Federal role and reasonably expected Federal, State, and local revenues were also assumed.

Based on the forecasts, NYMTC anticipates that it can cover system O&M costs in the future, but costs for system preservation and enhancement exceed available revenue. NYMTC is currently developing a regional financial plan for system enhancement to identify innovative funding sources that are already programmed (e.g., bonding, credits, etc.) and potential financing opportunities such as public-private partnerships, value capture and tax increment financing, debt financing, and regionally applied travel-based surcharges. As costs continue to track closely with revenues, NYMTC anticipates adopting innovative financing sources in the long term and as part of the implementation of *Plan 2040*.

<sup>7</sup> Per NYMTC's presentation: "Fiscal constraint requires that revenues in transportation planning and programming (Federal, State, local, and private) are identified and 'are reasonably expected to be available' to implement the metropolitan long-range RTP and the Transportation Improvement Program, while providing for the operation and maintenance of the existing highway and transit systems."

<sup>8</sup> Per FHWA, YOE dollars are "dollars adjusted for inflation from the present time to the expected year of construction. By using YOE dollars, this ensures that the more accurate cost estimates are used in planning, programming, and implementation of the project." For more information, please visit: <http://www.fhwa.dot.gov/planning/tprandnepasupplement.pdf>.

## Peer Approaches to Financial Scenario Planning

Three peer agencies—DVRPC, MTC, and CMAP—shared their experiences in applying financial scenario planning. The two peer sessions held during the workshop focused on two topics: a) risk-based planning in the scenario planning process; and b) dealing with uncertainties and unknowns in scenario development. The order of presentations shown below reflects the order used during the workshop. For information on the questions and responses provided throughout the sessions, please refer to [Appendix D](#).

### *Risk-based Planning in the Scenario Planning Process*

**Michael Boyer**

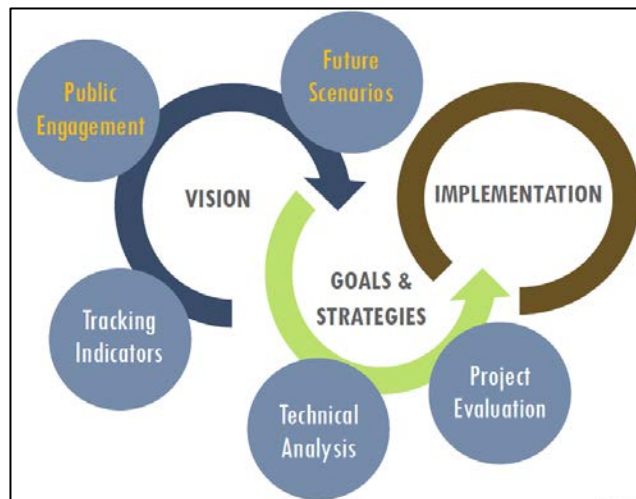
**Manager, Office of Long-Range Planning and Economic Coordination, DVRPC**

DVRPC—the MPO for the Greater Philadelphia region—has a long history of using scenario planning and risk-based planning. During his presentation, Mr. Boyer offered an introduction to DVRPC’s planning region and structure before detailing his agency’s approach to financial scenario planning (Figure 4).

DVRPC has a diverse planning region, covering 2 States, 9 counties, and 352 municipalities. The region is expected to have moderate population and employment growth in the future, with 6.15 million residents and 3.15 million jobs anticipated for 2040. Mr. Boyer noted that, while the region is growing, DVRPC shares similar concerns as NYMTC in terms of preserving and maintaining its transportation system.

As DVRPC supports transportation planning activities in both Pennsylvania and New Jersey, it develops a single LRTP for the region but separate TIPs and financial elements for each State. The agency is heavily reliant on Federal and State funding; less than 2 percent of TIP elements are from local sources.

DVRPC first used scenario planning in 2003, as part of its “what-if” scenario analyses in developing the 2030 LRTP. DVRPC’s “what-if” scenarios took a qualitative approach, asking stakeholders to vote on the probability and impact of a range of external factors such as increasing sprawl, encouraging regional growth, and emphasizing green spaces. As DVRPC developed its 2035 LRTP, it realized that some of the region’s older centers were in need of revitalization; DVRPC then built this theme into its next scenario planning effort in 2008, focusing on land use development patterns in the region. In 2011, DVRPC went a step further, tying land use changes to transportation infrastructure needs.



**Figure 4: DVRPC’s approach to financial scenario planning includes many feedback loops during the visioning, development of goals and strategies, and implementation phases.**

Source: DVRPC

DVRPC is now on its fourth iteration of scenario planning. In its current LRTP, *Connections 2040*, adopted in 2013 and amended in 2014, DVRPC identified fiscal austerity as a priority challenge, as there was about a \$50 billion gap between needs and resources.<sup>9</sup> To address this gap, DVRPC integrated a needs assessment for the plan into its scenario planning exercise. The exercise resulted in three funding

<sup>9</sup> *Connections 2040* is built around four core principles: 1) manage growth and protect resources; 2) create livable communities; 3) build the economy; and 4) modernize the transportation system. The plan addresses the impact of significant budget gaps, backlog of maintenance and preservation projects, and trade-offs in investment choices.

scenarios for transit improvements. The example below shows three potential scenarios for transit system improvements in the future:

- *Low Funding*: Basic maintenance and safety priorities; no new trains or rail expansion; larger projects are delayed
- *Medium Funding*: Backlog of projects completed but delayed; some new trains and station improvements; limited rail extensions
- *High Funding*: Achieve State of Good Repair (SOGR); replace all vehicles as needed; increase service; expand parking, transportation facilities, and rail network

To collect feedback on the scenarios, DVRPC implemented a “Choices and Voices” interactive web campaign. The web platform allowed users to select development patterns, create a transportation budget, and allocate funds to projects. At the end of the exercise, users were required to make trade-offs, as the activity was fiscally constrained. DVRPC added a crowd-sourcing element so that users could see how their scenarios compared to others.

DVRPC also used scenario planning as it developed the financial component of *Connections 2040*. The agency followed four steps: forecasting revenues, assessing needs, allocating revenues, and selecting projects as part of the plan. In forecasting revenues, DVRPC worked with the Pennsylvania and New Jersey Departments of Transportation to determine a flat revenue projection. The needs assessment, based on management systems, included a lifecycle costs analysis. For allocating revenues, DVRPC divided funding into highway and transit “pots” and then further divided these allocations into sub-allocations for maintenance and preservation, operational improvements, and system expansion. When performing these allocations, DVRPC created funding scenarios to demonstrate trade-offs; for example, under the low funding scenario, the agency was able to demonstrate that the Commonwealth of Pennsylvania would need to close 12 bridges, which helped encourage buy-in for more transportation investments. DVRPC then used a set of evaluation criteria to use in selecting the major projects for inclusion in the LRTP.

At the end of his presentation, Mr. Boyer offered a “5 C’s” framework as a useful resource to agencies considering scenario planning. When conducting scenario planning activities, it is often helpful to:

- Collaborate early and often;
- Use a consensus-based approach;
- Connect to the goals of the LRTP;
- Convey value and benefits; and
- Codify and use quantitative measures as available and where appropriate.

### ***Ken Kirkey Director, Planning, MTC***

MTC is the MPO for the San Francisco Bay Area in California and serve as the region’s transportation planning, coordinating, and financing agency. MTC’s planning region includes 9 counties and 101 cities, with 7.6 million residents today and 9.2 million anticipated in 2040. Much of the region is marked by a dense urban footprint, a mature transport system, and protected open space. While MTC is not the region’s COG, it has a history of addressing transit-oriented development and transport-housing policies. In addition, MTC has an operations unit that manages the day-to-day operations for 7 regional toll bridges, express lanes, and the Clipper/Fast Track transit pass program.

In presenting MTC’s scenario planning activities, Mr. Kirkey first discussed the agency’s RTP, *Plan Bay Area 2040*, and California Senate Bill 375 (SB 375).<sup>10</sup> SB 375 requires the State’s MPOs to align

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<sup>10</sup> Per the California Environmental Protection Agency Air Resources Board website, under SB 375, “each of California’s MPOs must prepare a ‘sustainable communities strategy’ (SCS) as an integral part of its RTP. The SCS contains land use, housing, and transportation strategies that, if implemented, would allow the region to meet its greenhouse gas (GHG) emission reduction targets. Once adopted by the MPO, the



transportation investments, housing growth, and land use planning, as well as to identify ways to house the region's population at all income levels and achieve State greenhouse gas (GHG) reduction targets. MTC looked to meet these SB 375 requirements through its *Plan Bay Area 2040* effort.

*Plan Bay Area 2040* indicates a growing economy, population, and housing need for the region in the future. To address funding needs for future investments, MTC included revenue forecasts in the plan. The bulk of funding in the plan is locally generated, as counties can pass local tax measures for transportation.

Approximately 53 percent of YOY dollars are from local sources, with 15 percent, 16 percent, and 11 percent coming from regional, State, and Federal sources respectively (Figure 5). Of the total \$292 billion in revenue anticipated, 56 percent would support maintaining the existing transit system, while the remainder would go towards maintaining existing roads and bridges (32 percent), transit expansion (7 percent), and road and bridge expansion (5 percent).

Source	YOY \$ billions	% of Total
Local	\$154	53%
Regional	\$43	15%
State	\$48	16%
Federal	\$33	11%
Anticipated	\$14	5%
<b>Total</b>	<b>\$292</b>	<b>100%</b>

Figure 5: Most of the anticipated revenue under *Plan Bay Area 2040* comes from local sources.

Source: MTC

To connect the revenue discussion with scenarios, MTC led a robust scenario planning process. Working with its stakeholders, MTC developed five scenarios and evaluated these by using a targets scorecard, which tracked how the scenarios fared against different targets (Figure 6). The targets related to climate protection, adequate housing, healthy and safe communities, open space and agricultural preservation, equitable access, economic vitality, and transportation system effectiveness. MTC then presented the scenarios and targets scorecard to the public to collect feedback. Public feedback centered on the following findings:

- Improve the Bay Area economy.
- Support housing density.
- Focus on expanding transit and maintaining roads.
- Focus land use strategies and transportation investments to reduce driving and GHG emissions.
- Prioritize improvements for the Bay Area's transit system.

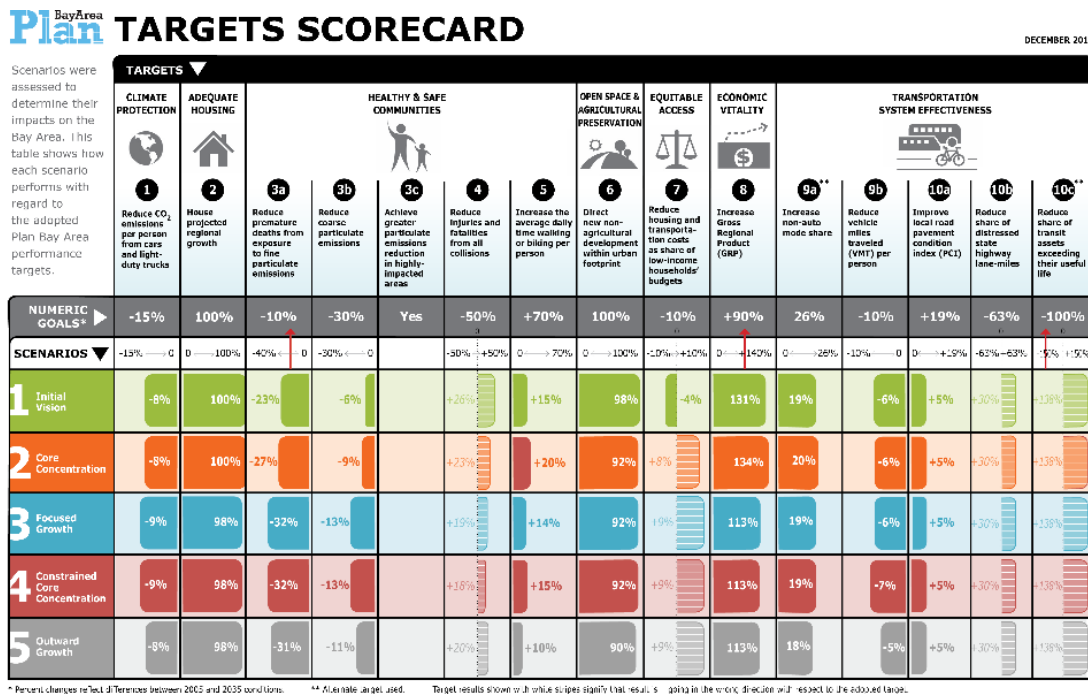


Figure 6: MTC's targets scorecard provided a comprehensive overview of each scenario to help evaluate trade-offs.

Source: MTC

RTP/SCS guides the transportation policies and investments for the region." For more information, please visit: <http://www.arb.ca.gov/cc/sb375/sb375.htm>

MTC realized that aligning its scenarios and the GHG emission reduction targets under SB 375 would be challenging. Using the feedback from the public, MTC developed a proposed investment strategy to address the public's interests and meet the GHG reduction targets. The investment strategy focused on the three E's of sustainability (economy, environment, equity), proposed the OneBayArea grant program to support local jurisdictions actively engaged in implementing the plan's goals, continued to recognize the existing "fix-it-first" policy as a primary priority, and included recommendations for transit expansion and improvement projects. MTC additionally tracked how the region was meeting GHG emission reduction targets. Efforts connected to *Plan Bay Area 2040* exceeded the targeted per capita reduction of 15 percent by 2035.

MTC's scenario planning and complementary investment strategy effort allowed it to encourage discussions about trade-offs and further test the scenarios. MTC's analyses showed that approximately \$56 billion in revenue would be available for trade-offs, out of the \$277 billion anticipated in revenue over a 28-year period. This information helped provide context for MTC's stakeholders and decisionmakers when discussing and determining priorities for the region's future.

***Elizabeth Schuh***  
***Principal Policy Analyst, CMAP***

CMAP is the MPO and regional planning organization for a 7-county, 284-municipality region in northeast Illinois.<sup>11</sup> Established by the Illinois General Assembly in 2005, CMAP consolidates the prior functions of the Northeastern Illinois Planning Commission and the Chicago Area Transportation Study. One of CMAP's first tasks was to develop and implement the region's LRTP, GO TO 2040. Ms. Schuh focused her presentation on CMAP's GO TO 2040 scenario planning and financial planning activities. CMAP is now working on the next update to its LRTP, due in 2018.

Completed in 2010, GO TO 2040 serves as a policy-oriented plan, focusing on four themes: livable communities, human capital, efficient governance, and regional mobility. While the plan includes many different recommendations, its transportation and financial plans are the most specific elements. One major policy recommendation that echoes throughout the plan is the need to invest in the existing transportation system.

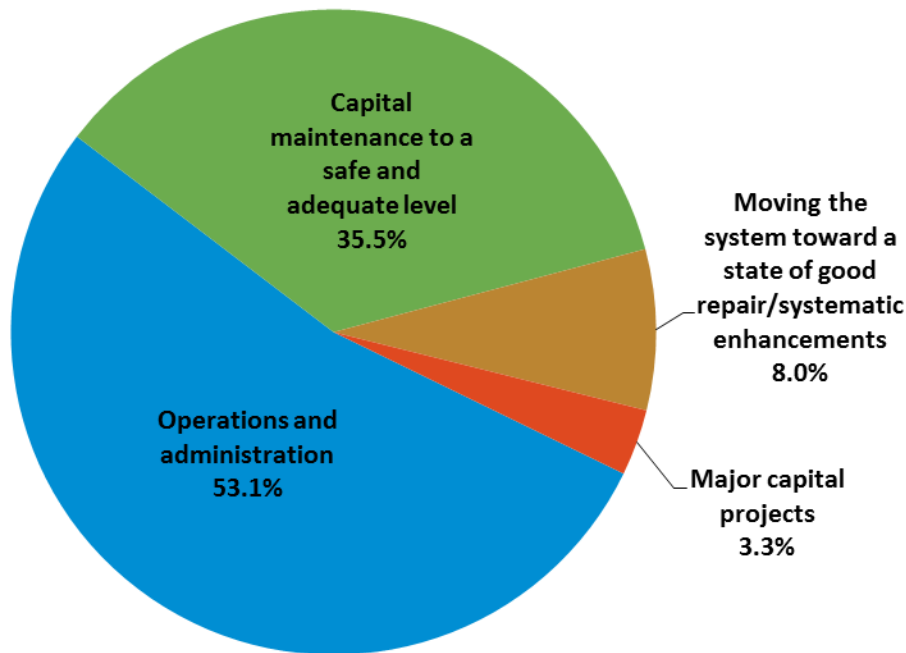
To collect input, GO TO 2040 first provided three broad scenarios for the public to review. From May through September 2009, CMAP conducted an "Invent the Future" public engagement phase to solicit feedback from stakeholders about the scenarios. The scenarios focused on the interaction of various land use and transportation strategies. Each of the scenarios also included qualitative cost estimates to help demonstrate how the scenario might be implemented and how revenues could be allocated.

To develop the financial component of GO TO 2040, CMAP assessed State, national, and regional trends in transportation funding as a way to identify best practices. In addition, CMAP focused on highlighting constrained funding resources to demonstrate the need for new revenues and project prioritization; these priorities tied in closely with PBPP.

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<sup>11</sup> CMAP's planning region includes the counties of Cook, DuPage, Kane, Kendall, Lake, McHenry, and Will.





**Figure 7: CMAP allocated funded under different “buckets” to determine trade-offs and confirm priorities.**  
 Source: CMAP

Under GO TO 2040 and the subsequent Plan Update in 2014, CMAP used a PBPP approach to determine priorities for transportation investments. CMAP’s “bucket approach” allocated funding to different “buckets” and then used criteria to evaluate proposed projects (Figure 7). In GO TO 2040, CMAP focused specifically on maintenance, modernization, and expansion.

In closing, Ms. Schuh shared lessons learned from CMAP’s GO TO 2040 and Plan Update efforts, particularly in leveraging the financial plan to help shape policy decisions:

*Opportunities*

- *Ground activities in reality.* GO TO 2040 helped CMAP demonstrate how the scenarios connected to qualitative funding outcomes and highlight the need for increased revenues to achieve potential future investments.
- *Allow for more current data and information.* The plan brought in current data and best practices from examples across the country, which helped strengthen its framework.
- *Enable a regional dialogue.* As part of the GO TO 2040 effort, CMAP was able to lead a dialogue in its region about investment priorities and cost efficiencies, which further built relationships with stakeholders and implementers.

*Challenges*

- *Long planning horizons and many data sources.* The LRTP’s 25-30 planning year horizon can be difficult to anticipate, as data may not be available or become less reliable further out. Implementers often only have “good” data for the first 10 years. Agencies may also need to review a variety of data sources in order to forecast future trends.
- *Definitional issues.* Agencies may have different interpretations of planning terms. For example, what is “reasonably expected” may differ by agency.
- *Balancing aspirations versus fiscal realities.* Focusing on fiscal realities can necessitate hard choices. Aspirational scenarios, accompanied with financial constraints, can help stakeholders better understand feasible options.

## Dealing with Uncertainties and Unknowns in Scenario Development

Each peer expert also provided a presentation on ways to deal with uncertainties when developing financial scenarios.

### Elizabeth Schuh, CMAP

Ms. Schuh's second presentation continued the discussion of CMAP's approach to financial scenario planning as part of its GO TO 2040 effort.

One of CMAP's primary goals in its GO TO 2040 scenario discussions was to focus on how to allocate limited resources. CMAP used a PBPP approach to implement "reasonably expected" revenues, create cost efficiencies through performance-based funding, and identify a limited set of capital projects that maximized regional benefits.

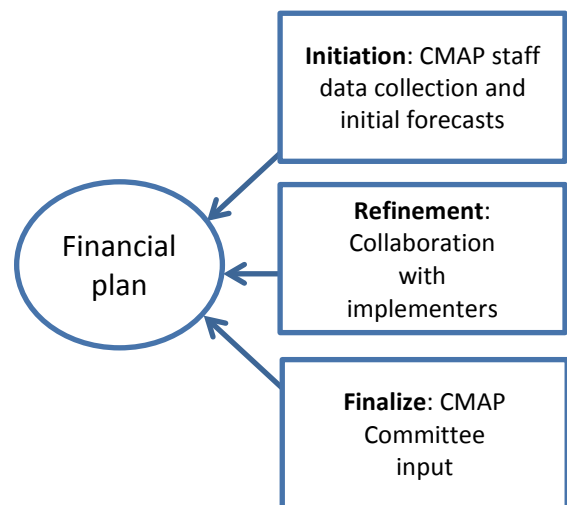
Financial plan components of the GO TO 2040 Plan Update included:

- *Long-range forecasts on both operating expenditures and capital maintenance.* CMAP looked specifically at how it could maintain its current system, based on typical maintenance cycles and data from implementers. CMAP focused on what would be allowable at a "safe and adequate" level to help address fiscal realities; Ms. Schuh noted that this approach, however, does not always reflect best practices, particularly relating to asset management and lifecycle costs.
- *Expenditures for moving the system to SOGR and systematic enhancements and for major capital projects.* CMAP used a regional prioritization process to determine the allocation of enhancements versus expansion. SOGR projects include maintenance and system performance improvement activities, while major capital projects relate to capacity improvements for the region's transportation system.

To develop reasonable assumptions for costs and revenues, CMAP worked with its implementers. The GO TO 2040 update includes \$167.1 billion in core local revenues and \$337 billion in O&M expenditures. About 80 percent of CMAP's revenues go towards O&M, with 6 percent to capital projects and 14 percent to systematic enhancements. Most of the revenues support highway O&M. CMAP's coordination with its implementers allowed it to evaluate transit ridership trends and potential fare increases. CMAP also looked at broader trends, including increased fuel efficiency and motor fuel tax, to incorporate these trends into its assumptions.

Ms. Schuh offered best practices for agencies interested in incorporating financial planning aspects into their scenario planning activities:

- *Use a collaborative process when developing your agency's financial plan.* CMAP used a collaborative process throughout GO TO 2040 and the Plan Update (Figure 8). At the beginning of the process, CMAP collected data and developed initial forecasts, assumptions, and projections. Through coordination with its implementers, CMAP modeled and refined its forecasts.<sup>12</sup> In finalizing the forecasts, CMAP turned



**Figure 8: CMAP collaborated with its implementers and stakeholders throughout the development of its financial plan.**

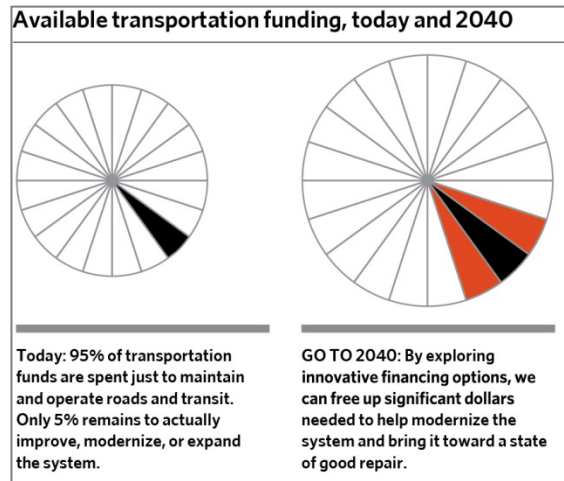
Source: CMAP

<sup>12</sup> For example, CMAP added debt service as a major cost consideration for the first time under the GO TO 2040 plan. While costs increased, revenues did not increase at the same pace: core revenues were only sufficient to support O&M of the existing system. CMAP worked with its implementers to identify preferred next steps.

to its various committees, including the CMAP Board, MPO Policy Committee, Transportation Committee, and Regional Coordinating Committee, to solicit input.

- *Obtain stakeholder buy-in.* CMAP used an iterative analysis process to evaluate its revenue options. Starting with 10 options, CMAP considered the feasibility of each to implement (e.g., congestion pricing, State motor fuel tax increase, vehicle registration fee). CMAP took five different revenue option ideas to the public and its stakeholders. The feedback received allowed CMAP to eliminate a possible regionally imposed vehicle registration fee.
- *Commit to implementing new revenues.* Through its stakeholder outreach, CMAP finalized four different revenue options.<sup>13</sup> CMAP then created an action plan to demonstrate how it could implement the revenues. The final action plan lists each of the policy changes and assigns lead implementers, timelines, and legislative requirements needed for each. The action plan helps demonstrate CMAP’s commitment to implementing the new sources (Figure 9).

GO TO 2040 served as CMAP’s first policy plan targeting the region’s priorities. The plan demonstrated the need for funding of the region’s transportation network and for regional support of PBPP and new revenues. In its next LRTP update, CMAP looks to provide more specific direction to implementers, particularly in addressing more elements of the transportation system, including financial cutoffs, and using indicators. In closing, Ms. Schuh noted that one of CMAP’s successes has been its continuous attention to its plans, which allows it to start thinking about goals for the next plan while finalizing a current plan.



**Figure 9: CMAP created different revenue options, such as the one shown here, to demonstrate how it could implement new revenues.**

Source: CMAP

### ***Ken Kirkey, MTC***

Mr. Kirkey followed his first presentation by sharing information on MTC’s next update to its RTP, which will be adopted in 2017. He discussed how MTC is working to have a specific scope and focus for the update. His presentation focused on three key activities:

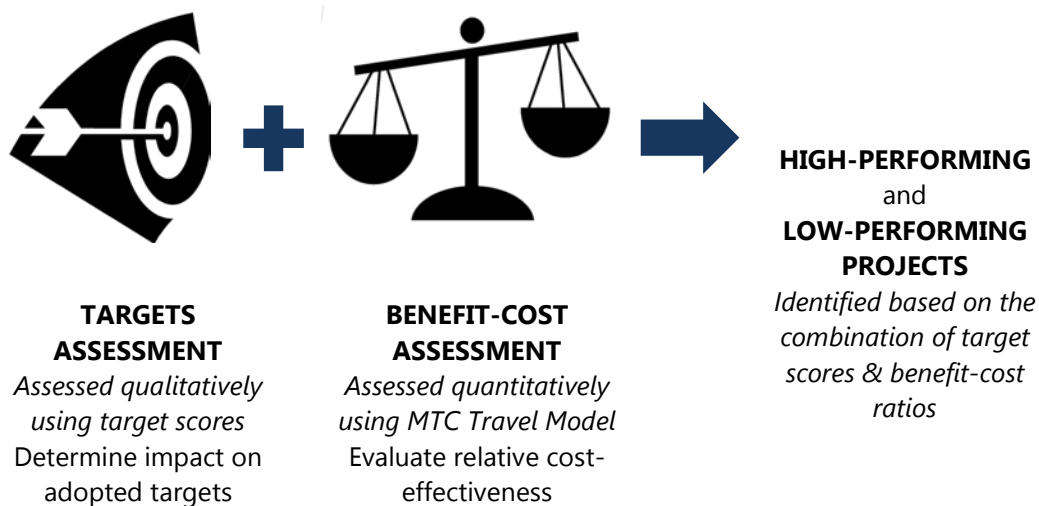
- *Develop goals and targets as a first step.* Throughout 2015, MTC is focusing on developing goals and targets and conducting project evaluations for projects over \$50 million in cost. MTC will evaluate the projects through a benefit-cost assessment as well as against targets set by the MTC Commissioners. In 2016, MTC will conduct a scenario evaluation and trade-off discussions. MTC’s goal is to have fewer, more varied scenarios. In 2017, MTC will then lead the Environmental Impact Report (EIR) process under the California Environmental Quality Act (CEQA), which requires the environmental review of a RTP. Through this process, MTC will present three scenarios for stakeholder feedback and incorporate these scenarios into three EIR alternatives.
- *Collect feedback on goals and targets.* In spring 2015, MTC held a series of public workshops and stakeholder meetings to begin identifying goals and targets for the LRTP.<sup>14</sup> During these

<sup>13</sup> The four revenue options were: State motor fuel tax increase and replacement, congestion pricing on the existing system, performance-based funding, and variable parking pricing.

<sup>14</sup> These discussions resulted in seven top priorities: 1) transportation system effectiveness; 2) adequate housing; 3) equitable access; 4) open space and agricultural preservation; 5) climate protection; 6) healthy and safe communities; and 7) economic vitality. During his presentation, Mr. Kirkey noted that “congestion on roadways” has since replaced “economic vitality.”

discussions, MTC heard from stakeholders about the importance of public health, access to jobs, displacement, congestion, and housing production. MTC then revised the performance targets to meet technical criteria. Mr. Kirkey noted that one of the challenges can be identifying targets that can be forecasted and influenced by the regional agencies, as this activity can often become a policy decision. Mr. Kirkey emphasized that the targets should be easy to understand and limited in number to maximize their effectiveness.

- *Rate transportation projects against goals and targets and feed into scenarios.* MTC will analyze transportation projects to determine how well they rate against the performance targets as well as their cost effectiveness. The results of this exercise will help identify high- and low-performing projects (Figure 10). In addition, the results will provide information for robust tradeoff discussions as MTC develops the preferred scenario. While MTC traditionally considers major uncommitted transit and roadway projects, along with major investments from regional initiatives, in tradeoff discussions, Mr. Kirkey shared that MTC is increasingly measuring SOGR as part of its project performance assessments.



**Figure 10: As part of its LRTP update, MTC plans to conduct both a targets and benefit-cost assessment to identify high- and low-performing transportation projects.**  
Source: MTC

MTC is currently refining its methodology for developing targets. In fall 2015, MTC plans to begin scenario development and identify transportation projects. Throughout the winter, MTC will evaluate the projects and release draft results. These results will then feed into the final preferred scenario, anticipated for completion by June 2016.

### **Michael Boyer, DVRPC**

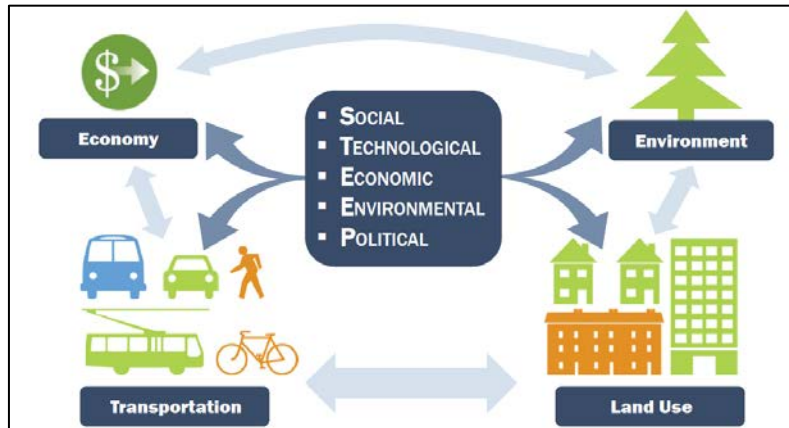
In his second presentation, Mr. Boyer discussed DVRPC’s current scenario planning activities and next steps in updating its 2045 LRTP, also anticipated for adoption in 2017.

In the update, DVRPC is incorporating five primary driving forces: social, technological, economic, environmental, and political (STEEP). DVRPC is particularly interested in how these future forces might impact the region (e.g., autonomous vehicles, 3-D printing, energy) (Figure 11). In addition, DVRPC is investigating regional “gamechangers,” such as improvements to the Northeast Corridor rail network and the development of the 30th Street rail yard.

DVRPC has long been involved in the discussion about driving forces. In 2010, DVRPC participated in a scenario planning for freight transportation initiative led by the Massachusetts Institute of Technology Center of Transportation and Logistics in connection with the Transportation Research Board’s National

Cooperative Highway Research Program (NCHRP) Report 750: *Scenario Planning for Freight Transportation Infrastructure Investment*.<sup>15</sup> As part of the effort, DVRPC conducted a workshop to test four scenarios for future freight flows. DVRPC also established the Greater Philadelphia Futures Group, comprised of representatives from the public, private, and academic sectors, to brainstorm global driving forces of change organized under the STEEP classification. The group identified 31 initial forces, which they later narrowed down to 17 and then to 5 through feedback from stakeholders. The final five scenarios were:

- *Enduring Urbanism*, which looked at the impacts of people, particularly millennials, moving into the city and older towns and the related effects on travel preferences;
- *Free-Agent Economy*, which evaluated the impact of less traditional 9-5 employment and growth in pop-up, shared, and gig economies;
- *Severe Climate*, which demonstrated a worst-case outcome of climate change and the impacts on transportation infrastructure, health, etc.;
- *Transportation on Demand*, which explored a multi-modal transportation system and how technologies affect services (e.g., rise of car-sharing services, services provided through the internet, real-time information, freight logistics); and
- *U.S. Energy Boom*, which investigated the outcomes of the Marcellus Shale boom on freight and distribution, and on the growth of petrochemical and other manufacturing, but also considers the environmental impacts of transporting oil and continued reliance on fossil fuels.



**Figure 11: DVRPC identified five primary factors for its driving forces: Social, Technological, Economic, Environmental, and Political (STEER).**

Source: DVRPC

DVRPC is now collecting input from its stakeholder groups on the five scenarios.<sup>16</sup> In its outreach, DVRPC asks stakeholders to consider the likely outcomes of each scenario and the actions and priorities the region should think about to allocate transportation infrastructure investments accordingly. DVRPC plans to incorporate the feedback received into the investments portion of the upcoming LRTP.

In addition, DVRPC will be evaluating universal investments and actions that it can take.<sup>17</sup> These activities will go into the policy component of the LRTP as well as the preferred scenario. As part of the LRTP update, DVRPC will also update its “Choices and Voices” platform to collect input for the plan.

<sup>15</sup> For more information on NCHRP Report 750, please visit: <http://www.trb.org/Main/Blurbs/168694.aspx>.

<sup>16</sup> As part of the outreach effort, DVRPC is engaging many of its committees, including the Public Participation Task Force, Goods Movement Task Force, Environmental Justice Working Group, Healthy Communities Working Group, and Regional Aviation Committee. DVRPC also has a public survey available online at: <http://www.dvrpc.org/50/survey/>.

<sup>17</sup> DVRPC’s universal investments and actions include : 1) Focus on mixed-use infill development occurring where transportation and utility capacity already exist; 2) Build lifelong communities that allow for aging in place; 3) Encourage immigrant-friendly policies; 4) Create and implement Vision Zero plans; 5) Encourage the development of freight consolidation centers; and 6) Expand telecommunications infrastructure bandwidth.

## Interactive Group Exercises

Throughout the workshop, participants engaged in discussions to share questions, feedback, and ideas. After each peer session, a break-out group discussion was held. Participants were divided into six groups and worked in their small groups to address a particular topic. The following reflects the themes heard during the report-outs from the break-out group discussions.

### ***Break-out Group Discussion 1: Challenges in Developing Financial Scenarios***

In the first break-out group discussion, each group was asked to identify three challenges that agencies in the New York region may face in developing financial scenarios. Challenges shared by participants included:

#### *Inconsistency and uncertainty:*

- Projecting forecasts beyond 10 years due to limited data
- Uncertainty of local, State, and Federal funding
- Uncertainty about the consistency of established revenue sources (e.g., gas tax, real estate taxes) and predicting anticipated new revenue sources
- Anticipating trends and communicating uncertainty

#### *Competing interests and needs:*

- Complexity of the New York region, which includes three States (New York, New Jersey, and Connecticut) and many agencies
- Competing interests of transit versus auto
- Reaching consensus across individual agency priorities
- Engaging decisionmakers and encouraging buy-in

#### *Lack of or limited resources:*

- Limited staff resources at MPOs, particularly in doing a large-scale scenario planning effort

In some cases, groups also identified strategies to address challenges, which included:

- Providing information to public and elected officials.
- Sharing services to reduce costs (e.g., getting more “bang for your buck”).
- Prioritizing projects, particularly in a fiscally constrained environment.
- Quantifying outcomes and distinguishing scenarios to establish consensus.
- Bringing all stakeholders to the table.
- Getting principals more involved.

### ***Break-out Group Discussion 2: Next Steps for Creating and Using Financial Scenarios***

Building on the discussions from the first break-out group session, the second break-out session focused on next steps for creating and using financial scenarios. Working in their groups, participants identified three uncertainties and/or contingencies that agencies in the New York region face in creating financial scenarios as well as brainstormed three potential strategies or solutions for applying these scenarios. Several of the uncertainties and strategies related to ideas shared during the earlier break-out group discussions. Uncertainties and potential strategies for addressing these uncertainties included:

#### *Uncertainties:*

- Funding uncertainties at all levels
- Political buy-in for the long-term
- Addressing climate change resiliency planning
- Agency resources (e.g., staff, funding, etc.)
- Newly developing technologies (e.g., car-sharing services, 3-D printing, disruptive technologies)
- Support from a broader network of stakeholders (e.g., trade groups, user groups, etc.) and differing perspectives on values and priorities



### *Strategies and Solutions:*

- Acknowledge the uncertainties for what they are and make the best use of the information available.
- Identify short-term issues that will help achieve a long-term goal.
- Use scenario planning to “embrace the unthinkable” and develop scenarios that show the range of projections or funding options available as a way to inform the final plan.
- When developing scenarios, consider ways to address sub-regional equity (e.g., develop scenarios by county to demonstrate local benefits, which can then help to build more reliable revenue sources).
- Consider developing a climate change resiliency scenario that addresses lifecycle costing.<sup>18</sup>
- Find or foster a “champion” to help carry the message forward.
- Develop a public engagement strategy for outreach to the public, elected officials, and other “core” stakeholders to increase awareness of scenario planning and the transportation planning process.
- Encourage agency coordination.
- Consider the possibility of a pooled funds study to help coordinate activities given limited staff and agency resources.

### *Roundtable Discussions*

On the second day of the workshop, NYMTC staff convened with the CMAP and DVRPC peers and FHWA and FTA representatives to debrief on the discussions from the previous day. Two roundtable discussions held as part of Day Two specifically focused on: 1) financial planning best practices; and 2) potential next steps for NYMTC’s financial scenario planning activities.<sup>19</sup> Ideas shared during the roundtable discussions are summarized below.

- **Building Consensus**
  - **Consider how to link land use and transportation investments.** As NYMTC does not have land use authority, the peers suggested ways to bring implementers “to the table” to demonstrate the benefits that scenario planning can bring. CMAP noted that showing the impacts on the costs to build infrastructure, reductions in land consumed, reduced commute times, etc. can help stakeholders understand the implications of choices. In addition, CMAP has a Local Technical Assistance Program that offers technical support to local agencies to further build awareness of the scenario planning process. DVRPC established a Transportation Community and Development Initiative program, which provides small amounts of funding to municipalities to do planning activities in line with the LRTP (e.g., streetscape improvements). This effort has helped DVRPC encourage buy-in and understanding of its LRTP.
  - **Keep it simple.** When collecting data from or presenting information to stakeholders, the peers recommended taking a simple approach. DVRPC works with its member counties to develop regional open space and green space plans to identify areas that are off-limits for development, rather than replicate existing data and plans. CMAP uses parcel data from counties that it then aggregates to the regional level.
- **Developing Scenarios**
  - **Embrace the “unthinkable.”** Both peers noted that it can be difficult to envision the future when there may be many uncertainties but that scenario planning can help lead to new ideas not originally thought possible. CMAP recommended focusing on outcomes, while

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<sup>18</sup> FHWA has supported several climate change scenario planning pilots, including in Cape Cod, Massachusetts, and Albuquerque, New Mexico. For more information on the Cape Cod pilot, please visit: <http://www.volpe.dot.gov/transportation-planning/public-lands/cape-cod-climate-change-scenario-planning-project>. Information on the Albuquerque pilot is available at [http://www.fhwa.dot.gov/environment/climate\\_change/adaptation/ongoing\\_and\\_current\\_research/albuquerque/index.cfm](http://www.fhwa.dot.gov/environment/climate_change/adaptation/ongoing_and_current_research/albuquerque/index.cfm) and <http://www.volpe.dot.gov/transportation-planning/public-lands/central-new-mexico-climate-change-scenario-planning-project>.

<sup>19</sup> Due to travel schedules and availability, the peers for Day Two were CMAP and DVRPC.

DVRPC suggesting documenting the uncertainties (e.g., autonomous vehicles) and parsing out projections to identify as many elements as possible.<sup>20</sup>

- **Apply innovative methods to address SOGR needs and financial uncertainties.** The peers discussed that, even when resources are constrained, scenario planning can help agencies make and document assumptions, particularly surrounding financial uncertainties, and use these to inform the LRTP. NYMTC noted that it has a large funding gap for SOGR. CMAP shared that, to address this gap, it created a category, “Safe and Adequate,” in its LRTP, which assumes that the transportation system is maintained as-is but that a deficit remains. Workshop participants also discussed the idea of “cost banding” to identify a range of years for which funding may be available rather than a specific, single year.
- **Next Steps**
  - **Identify drivers of change for the next RTP update.** As part of its upcoming RTP activities, NYMTC anticipates proposing drivers of change that will likely impact future growth or the demand for travel in the region. NYMTC noted that this effort will likely involve more of a qualitative assessment, similar to what DVRPC did in its early efforts, but that it will include opportunities for feedback from the public and NYMTC members.
  - **Leverage resources available at partner agencies.** NYMTC noted that the New York State Department of Transportation (NYSDOT) has expressed interest in partnering to model scenarios with different levels of funding, which would help provide a regional perspective. NYSDOT also has models, including an Infrastructure Needs Assessment Model and Transit Needs Assessment Model, which could be used to support data needs. In addition, the Metropolitan Transportation Authority has a 20-year capital needs assessment that NYMTC could potentially use to help develop its baseline.
  - **Consider a pooled funds or pilot study.** Depending on funds available, there may be an opportunity for NYMTC to establish a pooled funds or pilot study that helps a selected agency perform its own planning activities while integrating transportation and/or scenario planning elements. The recipient agency could serve as a “champion” in promoting the scenario planning approach.
  - **Cultivate “champions.”** Workshop participants discussed the idea of engaging “champions” from NYMTC member agencies or other partners to help kick-start the financial scenario planning process. Participants noted that these partnerships will also help test the reasonableness of financial projections in the future. Suggestions from the peers included meeting one-on-one with potential “champions” to share information and building a vision, such as that developed through DVRPC’s “Choices and Voices” campaign.
  - **Identify short- and longer-term goals for financial scenario planning implementation.** FHWA suggested developing a list of short-term goals that NYMTC could achieve in the coming year as well as longer-term goals for the next several years. The peers also noted that scenario planning often requires continual refinement and building upon concepts and ideas. Scenario planning can help create awareness, and NYMTC can build upon existing efforts each year.

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<sup>20</sup> For example, it may not be possible to forecast fully the impact that 3-D printing will have in the future, as the uncertainties of this technology and its impacts are too great. DVRPC instead tried to focus on different elements of 3-D printing such as the raw materials needed and began by forecasting the demands on these raw materials as a starting point.



## Conclusion and Next Steps

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The FHWA scenario planning workshop, hosted by NYMTC, provided an overview of financial scenario planning and demonstrated how three expert peer agencies are using this process to advance their LRTP activities.

Through the participation of the CMAP, DVRPC, and MTC peers, workshop participants learned about best practices in financial scenario planning and ideas that NYMTC could potentially leverage in its own financial scenario planning effort, including the following:

Peer Agency	Key Takeaways Shared During Workshop
CMAP	<ul style="list-style-type: none"> <li>• Ground activities in reality.</li> <li>• Allow for more current data and information.</li> <li>• Enable a regional dialogue.</li> <li>• Use a collaborative process when developing your agency’s financial plan.</li> <li>• Obtain stakeholder buy-in.</li> <li>• Commit to implementing new revenues.</li> </ul>
DVRPC	<ul style="list-style-type: none"> <li>• Collaborate early and often.</li> <li>• Use a consensus-based approach.</li> <li>• Connect to the goals of the LRTP.</li> <li>• Convey value and benefits.</li> <li>• Codify and use quantitative measures as available and where appropriate.</li> </ul>
MTC	<ul style="list-style-type: none"> <li>• Develop goals and targets as a first step.</li> <li>• Collect feedback on goals and targets.</li> <li>• Rate transportation projects against goals and targets and feed into scenarios.</li> </ul>

The workshop allowed for the sharing of strategies and perspectives on financial scenario planning, from the peer presentations to interactive discussions. Throughout the workshop, participants engaged in break-out and full group discussions to offer their thoughts on challenges and strategies for the region in using financial scenario planning.

Feedback provided by participants through evaluation forms submitted at the end of the workshop indicated that their knowledge of financial scenario planning grew as a result of the event. Participants also found value in the workshop content and peer presentations. The discussions on the second day of the workshop helped NYMTC further identify how it might apply financial scenario planning in the updates to its RTP.

## Appendices

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### A. About the FHWA-FTA Scenario Planning Program

The [Transportation Planning Capacity Building \(TPCB\) Program](#) is a joint venture of FHWA and FTA that delivers products and services to provide information, training, and technical assistance to the transportation professionals responsible for planning for the capital, operating, and maintenance needs of our nation's surface transportation system. The TPCB Program website ([www.planning.dot.gov](http://www.planning.dot.gov)) serves as a one-stop clearinghouse for state-of-the-practice transportation planning information and resources. This includes over 70 peer exchange reports covering a wide range of transportation planning topics.

The TPCB Scenario Planning Program, jointly offered by FHWA and FTA, advances the state of the practice in scenario planning by encouraging agencies to learn more about or apply scenario planning as part of their transportation planning activities. The program offers a range of resources for agencies interested in scenario planning or in need of scenario planning technical assistance, including on-call technical assistance, peer-to-peer sharing, and customized webinars and workshops.

## B. Key Contacts

### NYMTC

Gerry Bogacz  
Director, Planning  
New York  
25 Beaver Street, Suite 201  
New York, NY 10004  
(212) 383-7260  
[gerry.bogacz@dot.ny.gov](mailto:gerry.bogacz@dot.ny.gov)

### Peer Agencies

Michael Boyer  
Manager, Office of Long-Range Planning and  
Economic Coordination  
Delaware Valley Regional Planning Commission  
190 N. Independence Mall West, 8th Floor  
Philadelphia, PA 19106  
(215) 238-2848  
[mboyer@dvrpc.org](mailto:mboyer@dvrpc.org)

Ken Kirkey  
Director, Planning  
Metropolitan Transportation Commission  
101 8th Street, 3rd Floor  
Oakland, CA 94607  
(510) 817-5790  
[kkirkey@mtc.ca.gov](mailto:kkirkey@mtc.ca.gov)

Elizabeth Schuh  
Principal Policy Analyst  
Chicago Metropolitan Agency for Planning  
233 South Wacker Drive  
Suite 800, Willis Tower  
Chicago, IL 60606  
(312) 386-8681  
[eschuh@cmaph.illinois.gov](mailto:eschuh@cmaph.illinois.gov)

### NYSDOT

Michele Bager  
NYMTC Liaison, Statewide Planning Bureau  
New York State Department of Transportation  
(518) 457-2967  
[michele.bager@dot.ny.gov](mailto:michele.bager@dot.ny.gov)

### New York State Association of MPOs

Steven Gayle  
Senior Consultant  
RSG  
(802) 295-4999, ext. 1605  
[steven.gayle@rsginc.com](mailto:steven.gayle@rsginc.com)

### FHWA/FTA

Victor Austin  
Federal Transit Administration  
Office of Planning and Environment  
(202) 366-2996  
[Victor.Austin@dot.gov](mailto:Victor.Austin@dot.gov)

Brian Betlyon  
Federal Highway Administration  
Resource Center  
(410) 962-0086  
[Brian.Betlyon@dot.gov](mailto:Brian.Betlyon@dot.gov)

Maria Chau  
Federal Highway Administration  
New York Division - Albany  
(518) 431-8878  
[Maria.Chau@dot.gov](mailto:Maria.Chau@dot.gov)

Tyrhonda Edwards  
Federal Transit Administration  
Region 2  
(212) 668-2182  
[Tyrhonda.Edwards@dot.gov](mailto:Tyrhonda.Edwards@dot.gov)

Dave Harris  
Federal Highway Administration  
Office of Planning  
(202) 366-2825  
[Dave.Harris@dot.gov](mailto:Dave.Harris@dot.gov)

Rae Keasler  
Federal Highway Administration  
Office of Planning  
(202) 366-0329  
[Rae.Keasler@dot.gov](mailto:Rae.Keasler@dot.gov)

Karen Rosenberger  
Federal Highway Administration  
New York Division - Metro Office  
(212) 668-6091  
[Karen.Rosenberger@dot.gov](mailto:Karen.Rosenberger@dot.gov)

Spencer Stevens  
Federal Highway Administration  
Office of Planning  
(717) 221-4512  
[Spencer.Stevens@dot.gov](mailto:Spencer.Stevens@dot.gov)

## C. Event Participants

FIRST NAME	LAST NAME	AGENCY
Imran	Ahmed	NYMTC
Afolabi	Aiyedun	NYMTC
Brad	Allen	NYS DOT Main Office (MO)
Seitu	Allen	NYMTC
Michele	Bager	NYS DOT
Steven	Belkin	NYS DOT Region 10
Seth	Berman	New York City DOT
Brian	Betlyon	FHWA Resource Center
Sangeeta	Bhowmick	NYMTC
Gerry	Bogacz	NYMTC
Michael	Boyer	DVRPC
Bob	Brickman	Nassau County
Thusitha	Chandra	NYMTC
Maria	Chau	FHWA
Michael	Chiume	NYMTC
John	Czamanske	Orange County Transportation Council
Sandra	Dixon	Port Authority of New York and New Jersey
Blythe	Eaman	North Jersey Transportation Planning Authority (NJTPA)
Tyrhonda	Edwards	FTA
Brian	Fineman	NJTPA
Maria	Garcia	NYMTC
Leokadia	Glogowski	NYMTC
Doug	Greenfeld	NJTPA
Jean	Gunsch	NYMTC contractor
Chris	Hardej	NYMTC
Daniel	Johnson	NYMTC
Jan	Khan	NYMTC
Kyeongsu	Kim	NYMTC contractor
Ken	Kirkey	MTC
Craig	Lader	Westchester County
Karl	Leopold	Metropolitan Transportation Authority
Harriet	Lewis	NYS DOT MO
Uchenna	Madu	NYS DOT Region 11
Larry	McAuliffe	NYMTC
Isabel	McLoughlin	NYMTC contractor
Christian	Meyer	Naugatuck Valley Council of Governments
Keith	Miller	NJTPA
Ali	Mohseni	NYMTC

FIRST NAME	LAST NAME	AGENCY
Kathy	Monroe	NYMTC
Darrin	Moret	NYMTC
Larisa	Morozovskaya	NYMTC
Leah	Mosall	MTA
Daniel	Moser	FTA
Kevin	Olinger	New York City Department of City Planning
Munnesh	Patel	NYMTC
Jeff	Perlman	NJTPA
Geoff	Rick	NYMTC
Karen	Rosenberger	FHWA
Bill	Schiavi	South Jersey Transportation Planning Organization
Elizabeth	Schuh	CMAP
Manish	Shah	NYMTC
Mark	Solof	NJTPA
Rachel	Strauss	U.S. DOT Volpe Center
Lynne	Thisse	NYMTC
Natsumi	Yokura	New York City Department of Environmental Protection

## D. Workshop Agenda

New York Metropolitan Transportation Council (NYMTC)  
 Scenario Planning Workshop  
 Sponsored by the Federal Highway Administration (FHWA)  
 New York, New York

**Dates:** July 14-15, 2015

Host Agency: NYMTC

**Facilitator:** Brian Betlyon, FHWA Resource Center

Peers:

- Delaware Valley Regional Planning Commission (DVRPC)
- Metropolitan Transportation Commission (MTC)
- Chicago Metropolitan Agency for Planning (CMAP)

Workshop Overview:

This 1.5-day workshop, hosted by NYMTC, focuses on best practices for scenario planning, particularly financial scenarios, to build awareness and encourage information-sharing among NYMTC, its members, neighboring MPOs, and three peer agencies.

Workshop Goal:

Establish a series of guideposts for NYMTC in developing financial scenarios.

### DAY ONE

Time	Session	Speaker(s)	Objective(s)
9:00 - 9:30	Registration and Check-in		
9:30 - 9:45	Welcome and Introduction	<ul style="list-style-type: none"> <li>• Gerry Bogacz Planning Director, NYMTC</li> <li>• Karen Rosenberger FHWA New York Division</li> <li>• Tyrhonda Edwards Federal Transit Administration</li> <li>• Brian Betlyon FHWA Resource Center; Workshop Facilitator</li> </ul>	
9:45 - 10:15	Scenario Planning Perspectives	<ul style="list-style-type: none"> <li>• Gerry Bogacz Planning Director, NYMTC</li> <li>• Brian Betlyon FHWA Resource Center; Workshop Facilitator</li> </ul>	
10:15 - 10:30	BREAK		

10:30 - 11:45	Peer Presentation 1: Risk-based Planning in the Scenario Planning Process	<ul style="list-style-type: none"> <li>• Michael Boyer Manager, Office of Long-Range Planning and Economic Coordination DVRPC</li> <li>• Ken Kirkey Director, Planning MTC</li> <li>• Elizabeth Schuh Principal Policy Analyst CMAP</li> </ul>	
11:45 am - 12:15 pm	Break-out Group Discussion: Challenges in Developing Financial Scenarios	Workshop Facilitator, Participants	<ul style="list-style-type: none"> <li>• Identify three main challenges MPOs in the NY region face in developing financial scenarios.</li> </ul>
12:15 - 1:15	LUNCH		
1:15 - 1:45	Report-out: Challenges in Developing Financial Scenarios	Workshop Facilitator, Participants	
1:45 - 3:00	Peer Presentation 2: Dealing with Uncertainties and Unknowns in Scenario Development	<ul style="list-style-type: none"> <li>• Michael Boyer Manager, Office of Long-Range Planning and Economic Coordination Delaware Valley Regional Planning Commission</li> <li>• Ken Kirkey Director, Planning Metropolitan Transportation Commission</li> <li>• Elizabeth Schuh Principal Policy Analyst Chicago Metropolitan Agency for Planning</li> </ul>	
3:00 – 3:15	BREAK		
3:15 - 4:00	Break-out Group Discussion: Next Steps for Creating and Using Financial Scenarios	Workshop Facilitator, Participants	<ul style="list-style-type: none"> <li>• Identify the top three uncertainties and/or contingencies MPOs in the NY region face in creating financial scenarios, and three possible strategies or solutions for applying these scenarios.</li> </ul>
4:00 - 4:45	Report-out: Next Steps for Creating and Using Financial Scenarios	Workshop Facilitator, Participants	
4:45 - 5:00	Recap of Day/Next Steps	NYMTC Staff	

DAY TWO

Time	Topic	Speaker
8:30 am - 9:00	Registration and Check-in	N/A
9:00 – 10:00	Review of Day One / Set the Stage	Workshop Facilitator, Peers, NYMTC Staff
10:00 - 10:45	Round Table Discussion #1: Financial Planning Best Practices	NYMTC Staff, Peers, FHWA and FTA Staff
10:45 - 11:00	BREAK	
11:00 - 11:45	Round Table Discussion #2: Next Steps	NYMTC Staff, Peers, FHWA and FTA Staff
11:45 am - 12:00 pm	Wrap-up and Conclusions	NYMTC Staff



## D. Session Questions and Responses

Participants offered the following questions and responses during the workshop's sessions. Content shared in these questions and responses may not reflect the opinions or policies of FHWA or FTA. Responses are summarized below.

### Scenario Planning Perspectives

1. *In regards to land use mapping, are you doing this at the Transportation Analysis Zone (TAZ) level or parcel level?*

(NYMTC) Members indicate the levels from their master planning. We adjust the forecasts based on land use designations, but we do not go down to the parcel level.

### Peer Presentations

#### Risk-based Planning in the Scenario Planning Process

1. *Could you describe the amount of staff resources used during DVRPC's scenario planning effort?*

(DVRPC) We currently have around 110 staff. There is a core group of three people who worked on the effort full-time.

2. *In terms of funding for the 110 staff, what is the breakdown? Where does this come from?*

(DVRPC) We have funds through our Unified Planning Work Program. We also receive funding from our member governments for studies and often apply for grant funding for other projects (e.g., resiliency, energy planning).

3. *Who are the groups you typically try to generate consensus from?*

(CMAP) We focus on the seven counties and the City of Chicago. We also have strong participation from our implementers, such as the Illinois Tollway. In addition, we created an implementation plan for our scenarios and identified stakeholders for each scenario. The only way we can grow the system is through new revenues.

4. *How does this result in additional funding?*

(CMAP) For projects like the Tollway, we are actively investigating new elements of the system to review capacity in those projects. In some cases, our studies have found that congestion pricing will not work. One of our other recommended revenue sources is indexing tax over time. We have a role where we provide information; for example, we develop briefs about what different scenarios might look like such as our brief on alternatives to the motor fuel tax. The conversation on this topic is very active. For the rest of the State, the Illinois Department of Transportation uses a PBPP process, but there has not yet been movement on applying this approach to the State as a whole.

5. *How do land use/zoning/growth controls work in Chicago?*

(CMAP) For land use, we have the least control. Local governments are the key implementers. We do not have significant agricultural preservation; outreach on this topic continues to be an issue for the region. We have a local technical assistance program in which communities can apply for support in developing a basic comprehensive plan or updating their zoning. We use this local technical assistance program to implement land use recommendations, but we cannot effect these recommendations.

6. *Of the three scenario planning approaches shared here today by the peers, could NYMTC pick and choose and select the best practice from any of the peers?*

(FHWA) Yes, there is no prescribed approach. We have a FHWA [scenario planning guidebook](#) that also includes suggestions for using a scenario planning process. The scenario planning language in MAP-21 also opens up a number of questions on what scenario planning will look like in subsequent reauthorizations, but there is a lot of flexibility now. There are a number of best practices from the peers that NYMTC could potentially apply to the New York region.

#### Dealing with Uncertainties and Unknowns in Scenario Development

1. *Was CMAP's analysis focused on system O&M?*

(CMAP) We focused on the fact that it will cost a certain amount to operate an existing system. We looked at how we as a region can allocate the remaining amount. Part of the broader discussion is that we have to reserve funds.

2. *There is no Federal role in O&M. Given this, how would you go into this level of detail for the O&M side?*

(CMAP) We had core revenues barely sufficient to maintain the system. We wanted to make sure we were good with the numbers with our implementers. We had a gap in operating and maintaining the system.

3. *Did members agree with the gap?*

(CMAP) No, not always. This is where we get back to typical maintenance schedules and best practices schedules. We ended up having discussions about the timing of O&M.

4. *What is the sales tax in Chicago?*

(CMAP) It is 10.25 percent in some parts of the city. There is not a lot of capacity to increase the sales tax.

5. *Is there any way for you to adopt a MTP to meet Federal requirements where you do not need to do EIR under CEQA?*

(MTC) We have to do it every four years and need to meet the GHG targets. With SB 375, the MPOs in the State want to have every other plan update be the "big plan." Every eight years, we also need to do a regional housing need allocation, which must be consistent with the MTP and transportation investments.

6. *You mentioned that you wanted to have three scenarios. How many scenarios will you look at initially?*

(MTC) This is part of the discussion we are having now. We have a land use model called UrbanSim, which is a development pro form model that looks at development in the region based on different policy inputs. We want to work with stakeholders so that, when we construct the scenarios on the front end, they are bought into what the inputs are.

7. *What is "more effective and redundant" freight?*

(DVRPC) This is looking at freight logistics to make the system more efficient. We also want to have redundant systems built in.

8. *What kind of decision process did you use to agree on the probabilities for the scenarios?*

(DVRPC) The scenarios were chosen based on discussions with the Futures Group and with our member governments and agencies. The scenarios were then analyzed using several off-network models.

9. *How did you translate the plan into the TIP?*

(DVRPC) For the plan, the intent is to look at what the priorities are. As we develop the plan and come to the preferred scenario, this is the information we will look at to see how we will allocate funds. It is our first stab at guidance for allocating funding.

10. *With the “free agency economy” scenario, could you see the reduction of growth in travel, if not the actual shrinkage of travel?*

(DVRPC) With the “free agency economy” scenario, we may see more localized trips mid-day.

11. *Philadelphia is an older city. Are you seeing deteriorating water quality? Usually one of the things that underpins a strong city is the availability of sewer and water. I am wondering if there has been any comprehensive look at how DVRPC’s scenario planning activities relate to externalities. For example, you may not be able to build new sewer and water in the areas that are growing.*

(DVRPC) We have a lot of excess capacity in water and sewer systems in our inner ring. You do not want to replicate systems that you already have in place. The City of Philadelphia did a ground-breaking plan for the water system. They are not investing in hard infrastructure but rather working on “greening” the city, replacing impervious surfaces, creating “green” schoolyards, etc.

12. *How do you know there is capacity?*

(DVRPC) Both the City of Philadelphia and a lot of the older surrounding areas have additional capacity. Capacity would potentially be needed in some parts, but overall, it is there. One of the biggest challenges we dealt with was I-95. It is a viaduct through Philadelphia. Everyone agrees that it is a critical piece of the transportation system, but updating it and finding the funds to do so is challenging.

13. *In looking at the priorities based on the scenarios, not all of the scenarios are mutually exclusive. How do you address this?*

(DVRPC) There is overlap between the scenarios. At the end, we will have a preferred scenario. Once we have a preferred scenario, then we will discuss the factors in this scenario and go through an exercise to determine the type of investments we need to make.

14. *What tools are peers using for scenarios?*

(DVRPC) We received Strategic Highway Research Program (SHRP2) funding through FHWA to work with the Rapid Policy Assessment Tool (SHRP2 C16). This is a sketch-book methodology. We have also used Impacts 2050 to calibrate population across municipalities.

(CMAP) We have a travel demand model (TDM), Activity-based model, and a freight mesoscale model. On the PBPP side, we tend to use the TDM. In the near term, we want to stretch economic assessment beyond gross regional product and try to add an understanding of what is happening on the ground, such as industry types, businesses, and employees affected by a proposed investment.

(MTC) We primarily use three tools: 1) a tool out of Regional Economic Models, Inc. that looks at jobs and population forecasting by county; 2) UrbanSim, which uses policy inputs to create

scenarios; and 3) a TDM tied in with UrbanSim, which addresses projects that align with scenarios.

15. *For DVRPC—do you vary the amount of funding tied to each scenario?*

(DVRPC) Yes, we will be. For some scenarios, it will be fiscal austerity. For example, with climate change resiliency scenarios, there may be less funding set aside for transportation improvements because you are using these funds for resiliency activities.

16. *How did the peers address the issues that NYMTC is facing?*

(MTC) There are plenty of similarities, but there is a difference in the issue of political buy-in and buy-in from other agencies. For major projects, our partners and local transit agencies need State and Federal funding, which is controlled, in part, through our agency; this then requires them to work with us. We also have a mechanism where counties can pass sales tax measures. These measures provide a way for locals to identify what they want and see how it impacts them; it is measurable.

(CMAP) We make sure to touch base with our implementers regularly. We also do this at the county level and with transit agencies. Our process is also transparent; we try to understand concerns ahead of time and emphasize transparency. In addition, we want to focus on setting indicators. The more qualitative pieces are a bigger discussion; for example, we cannot wholly solve issues of equity, but we can have processes in place to have buy-in.

(DVRPC) I concur with MTC and CMAP. I think, from my perspective, we have been fairly lucky in our region. There are not a lot of political arguments. Because there is a back-log of system preservation and maintenance, it is much easier to rank those projects. Most of our debate relates to system expansion. The major difference I heard is institutional. There are State requirements that agencies must do. This is a big difference. There are institutional differences among the MPOs.

### **Interactive Group Exercises**

1. *How does the uncertainty of funding affect scenario planning?*

(Peers) Uncertainty will affect scenario planning. If you are not sure about the funds you will get, how will you make your projections? This then could be a scenario. You need to make assumptions about what your financial future will be. One way to do this is to set up a range to quantify the uncertainty.

2. *Are there tools to quantify outcomes and show the differences between scenarios? In some cases, when you try to quantify outcomes with the degree of control you have in the outcomes, you might not see too much difference in the quantitative indicators.*

(MTC) The performance metrics are pretty fine-tuned. We had variations of growth under the scenarios. If you have one approach that is highly focused and others that are not, you are not going to see big differences. We are now looking at where the bulk of our funding is to run through a project performance assessment to focus on where we are spending our money.

3. *The selection of indicators for scenarios is important. Are there any magic numbers for indicators?*

(DVRPC) On our end, less is more. We have 16 indicators. This is a large suite of indicators, but they are not all indicator-based. You can then have a discussion about how implementable they are. We can talk about if they are aspirational or if you can use a scenario planning process to flesh this out.

## E. Additional Resources

FHWA Scenario Planning Website

[http://www.fhwa.dot.gov/planning/scenario\\_and\\_visualization/scenario\\_planning/](http://www.fhwa.dot.gov/planning/scenario_and_visualization/scenario_planning/)

FHWA-FTA TPCB Website

<https://www.planning.dot.gov/>

FHWA Scenario Planning Guidebook

[http://www.fhwa.dot.gov/planning/scenario\\_and\\_visualization/scenario\\_planning/scenario\\_planning\\_guidebook/](http://www.fhwa.dot.gov/planning/scenario_and_visualization/scenario_planning/scenario_planning_guidebook/)

FHWA Financial Planning and Fiscal Constraint for Transportation Plans and Programs: Questions and Answers

[http://www.fhwa.dot.gov/planning/guidfinconstr\\_qa.cfm](http://www.fhwa.dot.gov/planning/guidfinconstr_qa.cfm)

## F. Acronyms

CEQA	California Environmental Quality Act
COG	Council of Governments
DOT	Department of Transportation
EIR	Environmental Impact Report
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GHG	Greenhouse Gas
LRTP	Long-Range Transportation Plan
MAP-21	Moving Ahead for Progress in the 21 <sup>st</sup> Century
MPO	Metropolitan Planning Organization
NCHRP	National Cooperative Highway Research Program
PBPP	Performance-Based Planning and Programming
RTP	Regional Transportation Plan
SB 375	Senate Bill 375
SOGR	State of Good Repair
STEEP	Social, Technological, Economic, Environmental, Political
TIP	Transportation Improvement Program
TPCB	Transportation Planning Capacity Building
USDOT	U.S. Department of Transportation
YOE	Year-of-Expenditure