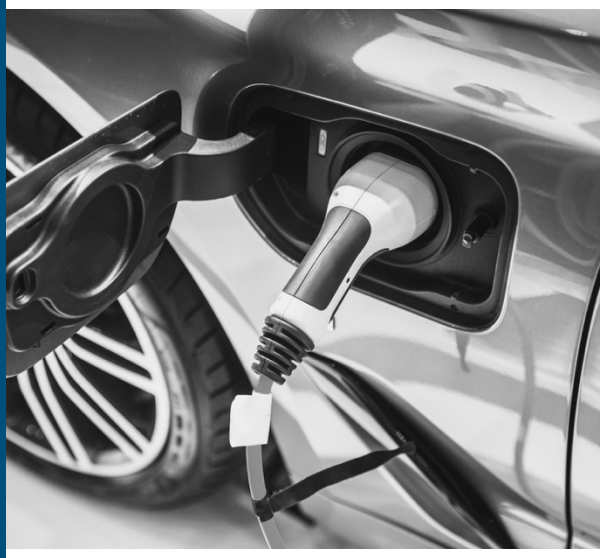
VISUALIZE 2050



Visualize 2050 Planning and Programming Process

Future Scenarios Planning

Part 25 of 27

National Capital Region
Transportation Planning Board

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OVERVIEW OF FUTURE SCENARIOS PLANNING

Scenario planning is a practice by which organizations and communities plan for an uncertain future by exploring multiple possibilities of what might happen. A scenario depicts a potential future generated by external forces that are largely beyond an agency's control, actions within an agency's purview, or a combination of both. Scenarios can be depicted as narratives or as charts and maps illustrating trajectories of change over time.

Scenario planning helps planning agencies examine possible futures, test strategies, and inform decision-making regarding investments in projects, programs, and policies to achieve goals. Over a couple decades, the Metropolitan Washington Council of Governments (COG) and the National Capital Region Transportation Planning Board (TPB) have conducted numerous scenario planning activities and analyses to predict and prepare for the future of the region that still influence decision-making today.

To better understand scenario planning, in 2020/2021, the TPB explored scenario planning processes and tools that could complement its travel demand modeling capabilities, enabling the TPB to generate and evaluate possible futures quickly and efficiently across a broad range of topics. Products of this work are listed below and may be found online[1].

- Organizational Definition of Scenario Planning
- Overview of Scenario Planning – White Paper
- Scenario Planning Practices Among Peer MPOs – White Paper
- Scenario Planning Tools – White Paper
- Organizational Awareness and Understanding of Scenario Planning – Final Report

Types of Scenario Planning

There are three approaches to scenario planning: predictive, normative, and exploratory; scenario planning for uncertain future conditions typically takes one of two forms: normative or exploratory.

1. Predictive scenario planning is the most common of the three approaches. Although there are many different types of scenario planning tools, travel demand forecasting models are a common tool, particularly for agencies that have the staff expertise to run such models. As an example, travel demand modeling techniques can be used to shape integrated land-use and transportation scenarios, especially in cases where the study focuses on environmental sustainability and multimodal accessibility. This form of planning uses alternative strategies that are tested against a forecast of future conditions extrapolated from past trends. Typically generating scenarios of anticipated system performance by combining one forecast of land development conditions (e.g., predicted numbers of jobs and households in a geography) with different packages of potential transportation improvements (e.g., adding more lane miles of roadways, increasing transit service coverage, or making no new capital investments).
2. Normative is a value driven process to build consensus toward a vision for a desired end state.
3. Exploratory is a tactical process to identify strategies for managing risks and leveraging opportunities to achieve long-term goals under a variety of different potential future conditions.

[1] National Capital Region Transportation Planning Board (August 11, 2021). *Scenario Planning Organizational Awareness and Understanding*. https://www.mwcog.org/documents/2021/08/11/scenario-planning-organizational-awareness-and-understanding/

Predictive scenario planning puts the focus on reacting to predicted future conditions, while normative and exploratory scenario planning emphasizes preparing for desired future conditions. Scenario analysts develop plausible descriptions of future conditions by combining assumptions about changes in external forces that are largely beyond the control of a single person or agency (e.g., socio-economic, technology, environmental trends) with potential actions or "levers" (e.g., infrastructure investments and public policies) that could be applied to influence outcomes (e.g., travel demand, transportation network characteristics, and land development patterns).

TPB'S ROLE AND KEY STAFF

With each update to the National Capital Region Transportation Plan, the TPB conducts a performance analysis of the planned future transportation system. When the analysis has yielded anticipated conditions that demonstrate insufficient outcomes or achievement of regional goals, the TPB has often conducted scenario planning. The TPB's scenario planning studies test future possible policy and investment strategies to enable decision-makers to reflect on future possible outcomes if they were adopted and implemented. Applying the most effective strategies, the TPB's members then take steps to plan, analyze, program, and implement based on local context and authority.

Three teams within the COG's Department of Transportation Planning (DTP) are typically involved in scenario planning work:

- The Plan Development and Coordination (PDC) Team, led by Lyn Erickson
- The Planning Data and Research (PDR) Team, led by Timothy Canan
- The Travel Forecasting & Emissions Analysis (TFEA) Team, led by Mark Moran

Table 25.1 lists some key staff who work in scenario planning. This table does not include past staff who have worked in this area.

TABLE 25.1: KEY STAFF

TPB Staff	Title	Role
Kanti Srikanth	Executive Director	Staff Director for the Transportation Planning Board (TPB)
Timothy Canan	Planning Data and Research Program Director	Program Lead
Lyn Erickson	Plan Development and Coordination Program Director	Program Lead
Mark Moran	Travel Forecasting and Emissions Analysis Program Director	Program Lead
Dusan Vuksan	Principal Transportation Engineer	Contributor
Sergio Ritacco	Senior Transportation Planner	Contributor

Leonardo Pineda II	Transportation Planner	Contributor
Erin Morrow	Transportation Engineer	Contributor

Strictly speaking, the TPB's air quality conformity analysis is an example of a scenario study (since it contains multiple network scenarios for different analysis years), but that type of study is not typically what is meant when people use the term scenario study, since for that analysis, there is no "what if?" component. The term scenario study is typically used for studies where different possible future scenarios are being explored for possible adoption. Using this more constricted definition, recent scenario studies include:

- The Regional Electric Vehicle Infrastructure Implementation Strategy, which examined three future scenarios for developing public access charging for electric vehicles; [2]
- The Climate Change Mitigation Study of 2021, which analyzed the greenhouse gas (GHG) emissions potential of 10 scenarios; and
- The planning analyses conducted by the TPB's Long-Range Plan Task Force (LRPTF). One of the main studies from the LRPTF analyzed 10 different future scenarios ("initiatives"), such as an additional northern bridge crossing, capacity improvements in Metrorail's core capacity, and optimizing regional land use balances.[3]

A 2022 COG/TPB study summarized many recent scenario studies.[4] More information about past scenario studies can be found later in this document.

The Unified Planning Work Program (UPWP) specifies the oversight committee for each COG/TPB work activity. Since scenario planning work is conducted by three COG/TPB teams (as noted above) and is a very broad term, there is no one committee or subcommittee that has oversight for scenario planning, but here are some committees that can have a role:

- TPB: The TPB will sometimes initiate scenario studies, but it usually delegates the technical work to a working committee, such as COG's Multi-Sector Working Group on Greenhouse Gas Emissions (MSWG),[5] or the TPB Technical Committee.
- TPB Technical Committee: The TPB Technical Committee rarely initiates scenario studies, but it often provides review of the technical findings/studies before they go to the TPB.
- TPB Travel Forecasting Subcommittee (TFS): This subcommittee has an oversight role for the development of the regional travel demand forecasting methods. Since the TPB regional travel demand forecasting model is often used for scenario studies, the TFS has an indirect role in scenario planning studies, but it typically does not have a role in initiating such studies or choosing the scenarios to be studied.

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[2] ICF and National Capital Region Transportation Planning Board (August 2024). *Regional Electric Vehicle Infrastructure Implementation Strategy Final Report.* https://www.mwcog.org/documents/2024/09/04/regional-electric-vehicle-infrastructure-implementation-revii-strategy-climate--energy-climate-change-electric-vehicles/

[3] ICF et al., (December 20, 2017). *An Assessment of Regional Initiatives for the National Capital Region: Technical Report on Phase II of the TPB Long-Range Plan Task Force.* https://www.mwcog.org/documents/2017/12/20/long-range-plan-task-force-reports-projects-regional-transportation-priorities-plan-scenario-planning-tpb

[4] National Capital Region Transportation Planning Board (November 9, 2022). *A Summary of the TPB and COG Scenario Study Findings: Informing Planning for the Metropolitan Washington Region Draft Report.* https://www.mwcog.org/events/2022/11/16/transportation-planning-board

[5] ICF International and Metropolitan Washington Council of Governments (January 31, 2016). *Multi-Sector Approach to Reducing Greenhouse Gas Emissions in the Metropolitan Washington Region Final Technical Report.* https://www.mwcog.org/file.aspx?D=Uj%2fOvKporwCjlofmfR2gk7ay5EmBOb9a4UhR7cKKQig%3d&A=ITSIgZNdO1uWwMHJVzfUV1WlPhZ9IDhMGqWlEQSf9CM%3d

As scenario planning studies are often quite complex and require involvement of land use planners, transportation planners, and travel demand and emissions modelers, extensive coordination is necessary for studies to be considered successful. Depending on the study, the TPB Technical Committee, special study-specific working groups, and the TPB may be consulted on scenario land use and transportation assumptions, tools and methodology, and interpretations of findings. The oversight groups include staff from the three state DOTs, WMATA, TPB member jurisdictions, and other agencies, as needed.

ROLE OF KEY PLANNING AGENCIES

Although most TPB-led scenario planning activities require some collaboration with COG's Department of Community Planning Services (DCPS) and COG's Department of Environmental Programs (DEP), some scenario planning activities in which TPB staff participate are headed by staff from other COG departments.

For example, in December 2014, the TPB and the Metropolitan Washington Air Quality Committee (MWAQC) affirmed COG's adopted voluntary greenhouse gas reduction goal of 80 percent below 2005 levels by 2050,[6] and committed staff and resources to support a multi-sector, multi-disciplinary professional working group to be convened by COG to:

- Identify viable, implementable local, regional, and state actions to reduce GHG emissions in four sectors (Energy, the Built Environment, Land Use, and Transportation) in accordance with the voluntarily adopted goals.
- Quantify the benefits, costs and implementation timeframes of these actions.
- Explore specific GHG emission reduction targets in each of the four sectors
- Jointly develop an action plan for the region.

In this case, in addition to the state DOTs, WMATA, and TPB member jurisdictions, other key regional planners representing the state air agencies and stakeholders provided overview and guidance to COG and TPB staff working on the project.[7]

PUBLIC ENGAGEMENT

All of the scenario planning reports are meant to serve as resources to address regional challenges, assist the region in accomplishing its goals, and determine the future transportation projects to fund and build. As public resources, these reports are available to the member agencies, jurisdictions, and the public to aid and inform decision-making for the Visualize 2050 regional transportation plan along with many other reports, studies, and tools.

During the actual scenario planning process for a specific study, members of the public have made comments during monthly Transportation Planning Board (TPB) meetings (in-person or via letter) on a variety of topics, ranging from scenario assumptions to technical tools. These comment

[6] National Capital Region Transportation Planning Board (December 17, 2014). *TPB R10- 2015: Resolution on the Metropolitan Washington Council of Governments' Regional Multi-Sector Goals for Reducing Greenhouse Gases*. https://www.mwcog.org/file.aspx?&A=NQRpyfkLR1A9O4KiCx0%2bhAVEs%2fYo7kI1bNCWYEItoHU%3d

[7] ICF and Metropolitan Washington Council of Governments (January 31, 2016). *Final Technical Report: Multi-Sector Approach to Reducing Greenhouse Gas Emissions in the Metropolitan Washington Region.* https://www.mwcog.org/documents/2016/08/01/multi-sector-approach-to-reducing-greenhouse-gas-emissions-in-the-metropolitan-washington-region-final-technical-report/

letters are considered by the TPB members when they are making recommendations and providing input related to the study.

During the project solicitation process for the plan, TPB staff advised project sponsors that project considerations included in Visualize 2050 were designed to evaluate how well the projects reflect the scenario findings and advance the TPB's policy framework. During Visualize 2050's public comment periods in 2023 and 2024, the TPB received several project-specific comments related to topics that have been analyzed in the scenario planning reports. These comments are also made in-person during monthly Transportation Planning Board (TPB) meetings or submitted virtually and summarized during these meetings.

At the TPB meeting held on September 18, 2024, some public comments caught the attention of a Board member and more information was requested on the TPB's ability to conduct another scenario for the air quality conformity analysis. TPB staff wrote a memo response that was shared with the TPB at their October 16, 2024, board meeting, under Item 5 – October Steering Committee and Director's Reports, explaining the difference between a scenario and the two options being analyzed for air quality conformity. This is an example of how public comment concerning scenario planning has been considered during the plan's development.

Another way the public is engaged is through the TPB Community Advisory Committee (CAC). The CAC is the main standing body for providing public input into the deliberations of the TPB, including those related to Scenario Planning. It is made up of over 20 members representing TPB member jurisdictions and represents a diverse array of backgrounds, interests, and perspectives. The CAC has focused on key regional transportation issues and offers comments to the TPB reflecting the diverse viewpoints on the committee. They have worked with the TPB to develop more user-friendly public information, like the TPB Scenario Planning Studies report discussed later in this chapter.

SCENARIO PLANNING STUDIES CONDUCTED BY THE TPB AND COG

The numerous scenario planning studies conducted by TPB and COG have examined many assumptions, scenarios, future factors and have tested strategies for their ability to achieve desired outcomes. The Summary of the TPB and COG Scenario Study Findings[8] and Appendix[9] report provides a summary and detailed findings analysis of TPB/COG's scenario planning efforts to date and provides a summary of findings that can be used to continue to advance planning in the region.

As the TPB plans for future updates to its regional transportation plan, these scenario findings can continue to inform regional planning as agencies make decisions about when, where, and how to invest in projects, programs, and policies, and how to coordinate these investments to benefit the region and prepare it to be successful in a range of possible futures.

This section and the Scenario Planning Studies report break down the different scenario planning considerations that were used to analyze the possible futures, such as, several facets of transportation: roadway, transit, bicycle, pedestrian, travel demand management (TDM), land use, legislation/policy and vehicle technology and fuels. Each study examined the potential impacts of various on-road transportation projects, programs, and policies, as well as vehicles technologies. These are referred to in this document as "strategies." Depending on how the study is designed, a strategy could be a single project, program, or policy, or a few similar projects, programs, and

[8] National Capital Region Transportation Planning Board (2022). *A Summary of the TPB and COG Scenario Study Findings*. https://visualize2050.org/wp-content/uploads/2023/01/TPB-Summary-of-Scenario-Study-Findings.pdf
[9] National Capital Region Transportation Planning Board (2022). *Appendix A: Detailed Findings Scenario Study Findings*. https://visualize2050.org/wp-content/uploads/2023/01/TPB-Detailed-Scenario-Study-Findings_Appendix-A.pdf

policies combined for analysis purposes. Table 25.2 shows the scenario studies and various topics considered in each study.

TABLE 25.2: TPB SCENARIO STUDIES SINCE 2006

Study	Year	Study Focus	Land Use	Roadway	Transit	Bike/ Pedestrian	Energy/ Built Environment	Legislation/ Policy
Regional Mobility and Accessibility Study: What If? (RMAS)	2006	Combination of land-use and transportation projects.	X					X
Regional Value Pricing Study (RVP)	2008	Extensive network of dynamically tolled lanes with BRT services.		X				X
What Would it Take? Scenario (WWIT)	2010	Strategies to reduce on-road GHG emissions (80% by 2050).	X	X	X	X	X	X
CLRP Aspirations Scenario Study	2016	Redistribute forecast jobs and housing to Activity Centers and near transit together with a network of variably priced lanes.	X	X	X	X	X	X
Multi-Sector Approach to Reducing Greenhouse Gas Emissions in the Metropolitan Washington Regional Final Technical Report (Multi-Sector Working Group)	2016	Contributions from on-road sector towards region's multi-sector 2050 GHG reduction goals (80% by 2050).	X	X	X	X	X	X
Long-Range Plan Task Force (LRPTF) Phase 1: From No-Build to All-Build	2017	Potential transportation system performance improvements from all projects in each TPB member's Comprehensive Plan.	X	X	X	X	X	X
Congestion Reduction Test (by 25 Percent Relative to 2030)	2017	Targeted congestion reduction through a package of pricing, policy and maximum highways and transit projects.		X	X			X

LRTPF Phase 2 Study: 10 Initiatives	2017	Potential of ten packages of integrated land use, transportation infrastructure and pricing strategies.	X	X	X	X	X	X
2030 Climate Energy and Action Plan - Risk and Vulnerability Analysis (CEAP CRVA)	2021	Contributions from transportation towards region's multi-sector 2030 GHG reduction goals.	X	X	X	X	X	X
Climate Change Mitigation Study of 2021 (CCMS)	2021	Transportation strategies to reduce on-road GHG emissions (50% by 2030 and 80% by 2050).	X	X	X	X	X	X
LRTP, 2022 Update: No Build Tests	2022	Impact of growth, highway projects and transit projects.	X	X	X			

SCENARIO CONSIDERATIONS FOR VISUALIZE 2050

On June 16, 2021, the TPB adopted Resolution R-19 2021, approving the inclusion of project submissions in the Air Quality Conformity Analysis for Visualize 2045. Included in that resolution was a mandate that the development of the next plan, Visualize 2050, "will include the consideration of multiple build scenarios and an analysis of each scenario's impact on the region's adopted goals and targets, including reduction of greenhouse gas emissions".

In response, following the Visualize 2045 Update adopted by the TPB in 2022, TPB staff prepared the above-mentioned summary report and appendix on the analyses that COG and the TPB have conducted and presented them to guide member agencies in their review and submission of investment strategies, (i.e., project or technical inputs), for Visualize 2050. The TPB's scenario studies documented in the referenced report explored various land-use, transportation, and policy strategies that would help advance its transportation, air quality, and climate goals, including equity. The analyzed scenarios range from representing incremental changes to the transportation system focused on one part of the region (e.g., what happens if the region builds a bridge) to a much larger in scale what-if scenarios (e.g., what happens if the region adds over 100 miles of rail in every part of the region).

During the Technical Inputs Solicitation (also known as a call for projects) for Visualize 2050, TPB staff advised sponsor agencies to consider the projects they have included in the current regional plan (Visualize 2045 update) and evaluate if these projects should still move forward based on the scenario findings and the priorities stated in the TPB policy framework. The scenarios were also available to inform future projects, programs, and policies to be implemented by the TPB's member agencies.

The TPB recognizes that projects that have not proceeded through the local planning process, and projects that do not yet have funding reasonably expected by the plan horizon, cannot be included in the plan. A lot of planning takes place before a project is included in the region's long-range transportation plan:

- Projects can take a long time — sometimes decades — to plan and develop, and the result can be different than the original project concept. Projects evolve based on local and regional priorities, public input, design and funding limitations, and advances in technology.
- Projects in the TPB's long-range transportation plan are typically developed at the state and local levels. Each state, locality, the District of Columbia, and the Washington Metropolitan Area Transit Authority (WMATA) control their own funding stream.
- Each jurisdiction has its own system for moving projects forward. New major WMATA capital projects such as stations or transit lines are built by the jurisdictions that the projects are in—in coordination with WMATA.
- Within each state, projects may be pursued for a variety of reasons and may have multiple sponsors.

In closing, TPB's scenario studies have informed member agencies of possible future outcomes given different applied strategies. Agencies reevaluated the projects and programs they would be able to undertake during the resubmission process in 2023/2024. The inputs they provided for Visualize 2050 aim to support TPB's regional transportation goals.