Transportation Planning Capacity Building Program

Metropolitan Transportation Commission / Association of Bay Area Governments
Scenario Planning Workshop

Sponsored by the
Federal Highway Administration

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Executive Summary

This report summarizes a 1.5-day scenario planning workshop that took place on April 23-24, 2018, in San Francisco, California, hosted by the Metropolitan Transportation Commission/Association of Bay Area Governments (MTC/ABAG). 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; for more information, see Appendix A of this report. Contact information for the FHWA and MTC/ABAG representatives involved in workshop planning is included in Appendix B of this report.

The workshop focused on advanced practices for exploratory scenario planning. It incorporated topics of emerging technologies, resilience, land use, and global and national economic trends, and connected scenario planning to public engagement opportunities. The workshop planning team designed the workshop to facilitate creative thinking and discussion among the workshop participants—who represented a diverse array of agencies and stakeholders—to inform a comprehensive Create-a-Future™ scenario planning exercise.

MTC/ABAG are San Francisco Bay Area's transportation and land use planning agencies. MTC/ABAG's planning area includes the nine counties that touch San Francisco Bay: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma. As the metropolitan planning organization (MPO), MTC/ABAG develops the Regional Transportation Plan (RTP) and maintains the Transportation Improvement Program (TIP) to manage short-range federally-funded transportation projects. Additionally, as the council of governments (COG), MTC/ABAG develops the State-required Sustainable Communities Strategy (SCS) and coordinates across 109 cities and counties in the region.

MTC/ABAG launched the Horizon initiative, previously referred to as Futures, to allow planners, policymakers, and the public to wrestle with challenging questions about uncertain forces that could shape the Bay Area through 2050. MTC/ABAG used the FHWA-sponsored scenario planning workshop to focus small group stakeholder discussion on how different forces might interact with one another, and how they might impact the Bay Area, resulting in the construction of "futures" (often called "scenarios"). Workshop participants engaged in a thoughtful exploratory scenario planning exercise, called Create-a-Future™, and crafted possible "futures" for the Bay Area in 2050.

The 18-month Horizon effort will explore a range of pressing issues to better prepare the Bay Area for the challenges it may face between now and the year 2050. In order to create a more equitable and resilient region, MTC/ABAG planners are using a "blue sky" planning approach, free of administrative or statutory requirements, to address topics ranging from transportation and land use to economic development and resilience. The end goal is to identify a series of policies, strategies, and investments that will be effective in realizing the five Guiding Principles of the Bay Area, which aim to make the region affordable, connected, diverse, healthy, and vibrant. MTC/ABAG will integrate successful strategies into Plan Bay Area 2050, the RTP/SCS anticipated for adoption in 2021.

The workshop featured four peer experts who shared presentations and perspectives on their professional experiences in using scenario planning and engaged with stakeholders during the event. The peer experts were:

- Michael Gallis, Principal, Michael Gallis & Associates;
- Nidhi Kalra, Co-Director, Center for Decision Making Under Uncertainty, and Director, San Francisco Bay Area, RAND;
- Brian Strong, Chief Resilience Officer, and Director, Office of Resilience and Capital Planning, City and County of San Francisco. and
- Hannah Twaddell, Technical Director, Integrated Transportation Planning for Sustainable Communities, ICF.

Key takeaways shared throughout the workshop included:

- o Many different "futures" could characterize the Bay Area in 2050, and it is critical to take an open-minded and multidisciplinary approach to developing possible future scenarios.
- o Many of the external forces that will shape the Bay Area in the years to come, such as sea level rise, immigration policy and market adoption of automated vehicles, are largely outside the control of Bay Area residents and interdependent on each other. This increases the necessity to build in policies and procedures to prepare for the possible impacts of such forces.
- o National and global political and economic factors will have a significant impact on Bay Area residents' transportation and lifestyle decisions.

The workshop allowed MTC/ABAG staff, subject matter experts, and representatives of Bay Area agencies spanning planning, transportation, housing, resilience, and other industries to discuss potential future scenarios for the Bay Area in 2050. Feedback received from participants indicated strong engagement throughout the workshop and genuine interest in the complicated external forces that will shape the Bay Area in the future.

Overview of the Workshop

Goals of the Workshop
The MTC/ABAG Horizon workshop focused on innovative futures development for scenario planning, particularly incorporating scenario planning into transportation, economic development, land use, emerging technologies, and resiliency. The workshop planning team designed the workshop to provide a space for creativity and critical thinking as participants developed futures that could characterize the Bay Area in the next few decades.

Selecting the Peers
In preparing for the event, the workshop planning team identified subject matter experts in the topics that are most important to MTC/ABAG as they embark upon their next RTP update: transportation, economic development, land use, emerging technologies, and resilience. In particular, MTC/ABAG sought peers that could deliver dynamic presentations and inspire creative, collaborative thought during the workshop's futures building exercise. Peers were also selected based on their familiarity with the external forces that are expected to impact the Bay Area in coming decades. Based on these criteria, the workshop planning team extended invitations to four subject matter experts to participate as peers:

- Nidhi Kalra, Co-Director, Center for Decision Making Under Uncertainty, and Director, San Francisco Bay Area, RAND;
- Hannah Twaddell, Technical Director, Integrated Transportation Planning for Sustainable Communities, ICF;
- Michael Gallis, Principal, Michael Gallis & Associates; and
- Brian Strong, Chief Resilience Officer, and Director, Office of Resilience and Capital Planning, City and County of San Francisco.

Format of the Event
MTC/ABAG hosted the 1.5-day workshop in San Francisco, CA, on April 23-24, 2018. The peer presenters, MTC/ABAG and FHWA staff, and representatives from other local agencies attended the workshop. A full list of attendees is available in Appendix C of this report.

Day One of the workshop featured presentations, full group discussions, and break-out groups that participated in the Create-a-Future™ activity. MTC/ABAG provided an overview of Horizon's scenario planning approach and how it integrates with the upcoming RTP/SCS update. The peer experts presented on their topics of expertise during the morning panel session, offering perspectives on how their organizations have implemented scenario planning activities, particularly in situations of deep uncertainty (Figure 1). Next, the workshop facilitator explained how the team-based Create-a-Future™ scenario building exercise would work, and participants broke for lunch and to assemble in their teams. Over the next hour and a half, the teams developed their unique future ("what if" scenario), using knowledge and background information provided by MTC/ABAG. Then, each group reported out on its future, and MTC/ABAG

Figure 1: Peer experts participated in the workshop and shared insights from their scenario planning experiences (from left: Matt Maloney, MTC/ABAG; Nidhi Kalra, RAND; Hannah Twaddell, ICF; and Michael Gallis, Gallis & Associates).
Source: MTC/ABAG.

engaged the peer experts to discuss the futures. Finally, workshop participants shared their thoughts on the activity and the resulting futures.

On Day Two, the peers and other participants mostly consisting of MTC/ABAG staff focused discussions on topics relating to 1) the effectiveness of the future development activity; (2) methods of public engagement and 3) other external forces, particularly economic forces, which will shape the Bay Area in the years ahead. The workshop agenda is provided in Appendix D of this report.

Introduction

MTC/ABAG Background

MTC/ABAG are the bodies created by the San Francisco localities and appropriate State and Federal agencies to perform the duties of an MPO and transportation planning agency under Federal regulations. MTC/ABAG's planning area includes the nine counties that touch San Francisco Bay: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma. As the MPO, MTC/ABAG develops the Regional Transportation Plan (RTP) and maintains the Transportation Improvement Program (TIP) to manage short-range federally-funded transportation projects. As the COG, MTC/ABAG develops the State-required SCS and coordinates across the region's 109 cities and counties.

MTC/ABAG staff are considering ways to integrate scenario planning futures building techniques more substantially into its public engagement activities and 2050 RTP update (Plan Bay Area 2050). MTC/ABAG staff expect to use an advanced scenario planning approach to inform its 2021 RTP/SCS update by developing scenarios, soliciting public input and refining scenarios, and incorporating the information collected from the process into Plan Bay Area 2050.

DAY ONE: Horizon Peer Exchange

Welcome and Introductions

MTC/ABAG staff welcomed participants to the workshop and provided opening remarks. Amber Shipley, Principal with Civic Edge Consulting, facilitated the event. She reminded workshop participants that the Horizon effort represents not only an advanced scenario planning approach, but also an advanced public engagement approach. #Planfor2050 is the hashtag that MTC/ABAG will use on its social media sites to publicize the activities related to this effort.

Brad Paul, the Deputy Executive Director of MTC/ABAG, kicked off the introductory remarks on behalf of the host agency. He listed the various external forces that are expected to impact the Bay Area in the near and distant future, such as the emergence of autonomous vehicles, sea level rise, a regionally damaging earthquake, rising housing costs, and the uncertain future of jobs. Paul expressed that, in order to plan strategically for these impacts, agencies like MTC/ABAG must not only identify potential challenges but do so creatively, applying a "what-if" scenario approach. Paul shared that the Bay Area was able to survive and thrive through challenges of past decades, and it will overcome the challenges of future decades as well. Addressing these challenges head on is the best way to approach planning.

Matt Maloney, the Assistant Planning Director of MTC/ABAG, asked workshop participants to raise their hands to identify the different sectors and industry types with representatives. The groups spanned transportation agencies, housing and development agencies, nonprofits, private sector firms, think tanks, academia, and Federal and State transportation staff. Maloney emphasized that, in this industry, agencies must constantly reinvent themselves to remain relevant. Horizon focuses on not only scenario planning, but advanced strategies for community engagement. Maloney explained that, in selecting the workshop participants, MTC/ABAG had created a room of local experts to participate in a robust critical thinking exercise and explore the many divergent futures that may characterize the Bay Area in years to come.

Tashia Clemons, Director of Program Development with the FHWA California Division, added that the entire country looks to the Bay Area for leadership in not only scenario planning, but devising solutions to address complex future challenges.

Dave Vautin, Principal Planner with MTC/ABAG, provided an introduction to the agency's Horizon initiative. After the completion of Plan Bay Area 2040, MTC/ABAG staff had a unique opportunity to think critically about how to execute regional planning more effectively moving forward. One of the agency's primary goals was to plan more comprehensively than ever before. At the same time, there existed an obligation to address the challenges that face the world today. Historically, resilience to external forces has been a central strength of the Bay Area. In recent years, unanticipated events, such as impacts from natural disasters and emerging technologies, have begun to reshape the region in unexpected ways. The region must plan to address the impacts of political, economic, and environmental challenges in order to plan effectively for the future, which remains uncertain. Furthermore, many of the external forces that will affect Bay Area residents in the years and decades to come, even though those forces are outside of the control of Bay Area residents or elected officials.

MTC/ABAG's Scenario Planning Perspectives

MTC/ABAG staff provided an overview of the agency's scenario planning activities, particularly the current Horizon effort. MTC and ABAG, the San Francisco Bay Area's transportation and land use planning agencies, launched the Horizon initiative, previously referred to as Futures, to allow planners, policymakers and the public to wrestle with challenging questions about the forces that could shape the Bay Area through 2050. These external forces and the potential futures—often called "scenarios"—that they could produce will be the focus of this event.

The 18-month Horizon effort will explore a range of pressing issues to better prepare the Bay Area for the many challenges it may face between now and the year 2050. In order to create a more equitable and resilient region, planners are pursuing a "blue sky" planning approach, free of administrative or statutory requirements, to address topics ranging from transportation and land use to economic development and resilience. The end goal is to identify a series of policies, strategies, and investments that will be effective in realizing the Guiding Principles of the Bay Area, regardless of what happens in the decades ahead. Guiding Principles for the initiative were informed by a public outreach process and finalized in May 2018—to have an Affordable, Connected, Diverse, Healthy, and Vibrant region in 2050.[1] MTC/ABAG will integrate these strategies into Plan Bay Area 2050, the RTP/SCS anticipated for adoption in 2021.

The Horizon initiative will seek to explore a suite of challenging questions that transcend the traditional framework used for past Plan Bay Area efforts. Examples of such questions include:

- What might the adoption of automated vehicles (AV) mean for our pipeline of transportation investments?
- What strategies should we consider to prepare for increasingly-frequent disasters, including from extreme weather events?
- How should we plan to mitigate sea level rise?
- When another recession could be just around the corner, how do we address complex challenges of employment and housing?
- How do we plan for geopolitical and economic shifts?
- How do we balance economic development, housing affordability, and environmental priorities?

MTC/ABAG is working with the Bay Conservation and Development Commission and their Adapting to Rising Tides (ART) program, which is a collection of staff support, guidance, tools, and information to help agencies and organizations understand, communicate, and begin to resolve complex climate change issues. One of Adapting to Rising Tides' key elements is the ART Approach: an approach built on a traditional planning process framework that ART Program staff refined to address the specific challenges of building climate resilience across different communities, assets and services, and jurisdictions and owners. Additionally, a new group convened by MTC/ABAG—the Committee to House the Bay Area, or CASA—is working to address issues related to the area's housing crisis.

Peer Approaches to Scenario Planning

Following the overview of MTC/ABAG's scenario planning process and approach, the peer experts shared their scenario planning experiences and connections to different factors, such as dealing with uncertainty, new mobility and automated vehicles, the future of jobs, and resilience. The summaries below share highlights of each peer presentation. The summaries are presented below in the order of the presentations provided.

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[1] The Guiding Principles, as identified through the Horizon initiative, are as follows:
Affordable: All Bay Area residents and workers have sufficient housing options they can afford—households are economically secure.
Connected: An expanded, well-functioning transportation system connects the Bay Area—fast, frequent, and efficient intercity trips are complemented by a suite of local transportation options, connecting communities and creating a cohesive region.
Diverse: Bay Area residents support an inclusive region where people from all backgrounds, abilities, and ages can remain in place—with access to the region's assets and resources.
Healthy: The region's natural resources, open space, clean water, and clean air are conserved—the region actively reduces its environmental footprint and protects residents from environmental impacts.
Vibrant: The Bay Area is an innovation leader, creating quality job opportunities for all and ample fiscal resources for communities.
For additional information, please visit the MTC/ABAG website at: https://mtc.ca.gov/our-work/plans-projects/horizon.

Peer Presentation 1: Decision Making Under Uncertainty

Nidhi Kalra
Co-Director, Center for Decision Making Under Uncertainty, and Director, San Francisco Bay Area, RAND

Nidhi Kalra explained that, as planners, we often ignore the risks that are hardest to measure, even when they pose the greatest threats. Unfortunately, challenges in the real world do not take into account whether their impacts are measurable, so we need to devise better methods of assessing risks even when we have not yet established methods to do so. Kalra shared a graphic depicting energy use versus gross national product in the United States to show how often our best estimates prove to be wrong; the graph was linear until the Organization of the Petroleum Exporting Countries issues in the 1970s, and the graph has starkly changed (Figure 2).

Kalra noted that the scenario planning approach to planning for uncertainty was developed at RAND in the 1950s. Humans are natural scenario planners, because we become anxious by uncertain futures and would prefer to be able to plan for them. However, humans make the mistake of imagining futures that look like the past, which makes us overly confident in assigning certainty to the futures we expect to occur.

Kalra's work focuses on decision making under deep uncertainty (DMDU), or as she described, scenario planning on computational steroids. For example, this approach uses travel demand models to develop hundreds or thousands of scenarios and then uses machine learning to identify the robust plans to address those scenarios. In short, this approach uses analytics to facilitate discourse among humans. DMDU methods are being used increasingly across the world.

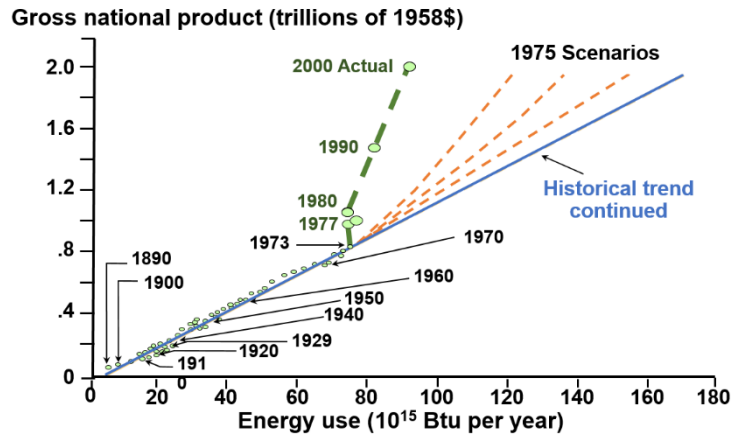**Figure 2: In the early 1970s, forecasters projected U.S. energy use that followed closely with historical trends; however, the forecasts ended up varying significantly from how actual use occurred over time due to unforeseen external factors.**
Source: Nidhi Kalra.

Figure 3: Peer expert Nidhi Kalra of RAND shared scenario planning perspectives, particularly as related to decision making under uncertainty.
Source: MTC/ABAG.

Peer Presentation 2: New Mobility/Automated Vehicles

Hannah Twaddell
Technical Director, Integrated Transportation Planning for Sustainable Communities, ICF

Hannah Twaddell began her presentation by providing a brief list of commonly used (and misused) terms, noting that planners and citizens are discussing connected and automated vehicle technologies more frequently, but may not be using the same terminology to do so.

Figure 4: Peer expert Hannah Twaddell of ICF focused her presentation on the role of emerging technologies in scenario planning and transportation.
Source: MTC/ABAG.

- **Six levels of vehicle automation**, ranging from none to full: Almost all vehicles on the road today provide Level 1-2 features such as automatic transmissions, cruise control, and corrective steering. Level 3-4 vehicles are being tested in some cities and corridors around the world, some of which can operate fully autonomously but only in environments and conditions that they can "read" and respond to. Level 6 vehicles that can travel anywhere in any conditions are not yet available. Given how slowly the entire fleet of American vehicles is likely to turn over, America's roadways will probably support a wide array of levels for decades.

- **Three types of vehicle communication systems**: V2V (vehicle to vehicle); V2I (vehicle to infrastructure); and V2X (vehicle to everything). "Connected" vehicles are becoming more ubiquitous every year, and will go a long way toward improving traffic safety regardless of how quickly autonomous connected vehicles take hold in the marketplace.

- **Mobility-as-a-Service (MaaS)**: This describes a shift away from the use of personally-owned vehicles and toward mobility options that are consumed as an on-demand service. MaaS options available in many cities today include taxis, Transportation Network Companies (TNCs), such as Uber and Lyft, and bikeshare programs.

Twaddell used the example of elevators to show how automated technologies can influence urban development in ways almost impossible to imagine ahead of time. Like automated vehicles, elevators were initially conceived simply as tools to transport people and goods. Their widespread adoption, however, led to the development of skyscrapers, which drastically changed the way in which cities developed. Widespread use of autonomous vehicles and / or MaaS could have a similarly profound impact on urban landscapes by virtually eliminating the need for surface parking lots.

She concluded her presentation by discussing a set of six draft scenarios that ICF was developing for an FHWA guidebook expected to be out by the fall of 2018 (Figure 5). Planners can adapt the basic scenarios to suit a variety of urban contexts and trends in order to test the potential impacts of emerging technologies.
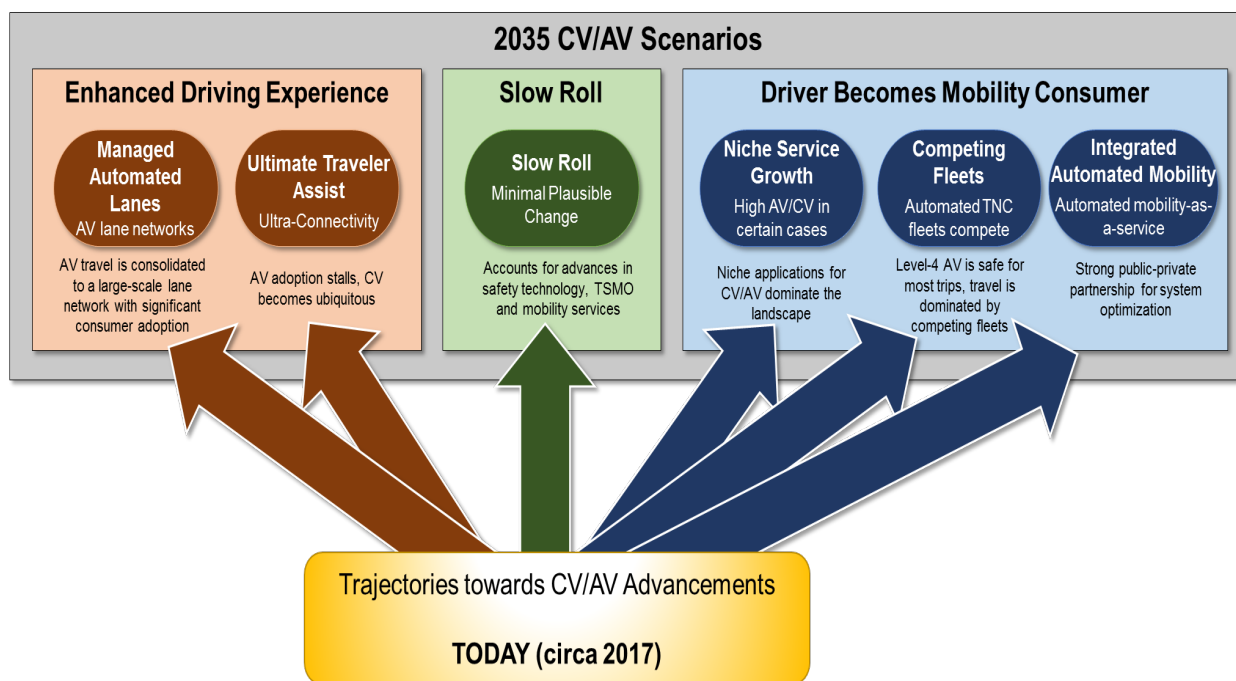

Figure 5: Draft scenarios depicting different trajectories of technology adoption. A region could experience several scenarios occurring simultaneously in different areas and /or evolving at different rates.
Source: Hannah Twaddell, ICF.

Peer Presentation 3: The Future of Jobs

Michael Gallis
Principal, Michael Gallis & Associates

Michael Gallis explained that many of the complicated challenges the Bay Area faces can best be described within a systems of systems framework. When planners optimize transportation and other systems (e.g., environmental, economic, urbanization) in areas where people live, especially large metro areas like San Francisco, they must think in a systems-based way. Regions can also be planned in a systems-based way, and Gallis noted that regional planning seems to be where much of the most progressive work in transportation planning is happening. A systems-based approach also allows for cross-system planning across different systems, sectors, and industries. For example, Gallis clarified that "land use," as it is discussed in transportation, is a two-dimensional multi-colored map, and not really focused on real estate and market activity. Without an understanding of the market forces and dynamics that drive real estate development, planning transportation systems to produce more efficient and environmentally sustainable urban regions is not possible. The focus on internal factors and the lack of understanding of other systems and their dynamics is a barrier to creating more efficient and cost-effective urban regions, and results in greater environmental damage.

Figure 6: Peer expert Michael Gallis offered insights on using a systems-based approach to regional transportation planning.
Source: MTC/ABAG.

Gallis shared his perspectives on the current systems for funding transportation at the national and State levels. According to Gallis, the way in which Federal and State entities fund transportation does not reflect the connected nature of transportation systems to other systems and therefore does not properly capture the value it creates in other systems. Per Gallis, funding strategies need more attention and require updating.

Gallis discussed that the limited understanding of the relationship between transportation and other systems was not always this way. He noted the example of the U.S. DOT, which was housed within the U.S. Department of Commerce until it became its own government entity in 1966. Gallis noted that, at that time, transportation was understood not a thing in itself but something that served commerce. He shared that today people know transportation is connected to every other system, but do not plan it that way. Transportation planners often get locked into project-based thinking, but it is essential to remember the interconnectedness between transportation and other system patterns and dynamics, such as population growth, environmental deterioration, and economic changes.

Peer Presentation 4: Resilience

Brian Strong
Chief Resilience Officer and Director, Office of Resilience and Capital Planning, City and County of San Francisco

Brian Strong began by noting that not only the workshop panelists but also the participants brought a great deal of subject matter expertise to the event.

Strong explained that, as a result of a collaborative project with 100 Resilient Cities, a nonprofit organization that is financially supported by the Rockefeller Foundation, San Francisco was one of the first cities in the nation to develop a resilience strategy. Resilience has recently become a trendy term, but San Francisco has been working to improve resilience for over a century. Political leaders in San Francisco have long realized that resilience is as much an economic justice issue as an infrastructure issue.

One of the main challenges of disaster planning is that cities typically only get funding to react to natural disasters after they occur, instead of receiving funding to complete mitigation work before they occur. San Francisco expects to have a population of approximately 1.1 million by 2040, a little more than 25 percent of the current population. This will intensify not only demand for critical amenities such as housing, but may push greater growth in areas that could be impacted by liquefaction in the event of an earthquake. Additionally, in a large disaster, the Federal Emergency Management Agency often is not able to access every home, so neighbors must rely on each other to form a strong network and keep

Figure 7: Peer expert Brian Strong discussed resilience activities and opportunities for the San Francisco Bay Area.
Source: MTC/ABAG.

each other safe in emergency situations. Unfortunately, this is happening less and less as more people do not know their neighbors or feel bonded to their communities. Annually, 40,000 people leave the city, and 50,000 new residents join it. The City and County of San Francisco is attempting to address this by covering fees for neighborhood block parties throughout its counties to build social ties.

Strong concluded by emphasizing the importance of strong public engagement: if you have a plan but don't know how to move it forward, the public often can't quite understand the actions that are supposed to take place, and the plan gets stuck. To make large scale infrastructure changes, cities need large scale plans. The City of San Francisco needs a hazard mitigation plan that is comprehensive enough to actually drive policy. The private sector has a role to play as well, since private entities often have liberties and funding that public entities do not.

Create-a-Future™ Activity

Activity Instructions

After the workshop peers delivered their presentations, the participants broke for lunch and separated into 11 pre-assigned, multidisciplinary teams to participate in the Create-a-Future™ activity (Figure 8). MTC/ABAG staff and planning team members served as facilitators for each of the teams. To kick off the activity, each team received a Horizon Create-a-Future™ game board, which consisted of different tiles to represent different external forces, separated by topic area, including environment, government policy, technology, housing, etc. Each team had several tiles with pre-assigned conditions given to them upon beginning the exercise. The teams were each tasked with using their given conditions as well as their knowledge of the impacts of the various forces to fill in the rest of the tiles and

Figure 8: The workshop featured a Create-a-Future™ activity in which participants used a game board and tiles representing different external forces to identify plausible futures for the region. *Source: MTC/ABAG.*

develop a plausible future scenario. Teams had approximately 90 minutes to complete their game boards by selecting all of the forces that would characterize their futures. Upon completion, teams chose names for their futures. Then, each team identified a representative to provide a one-minute explanation of the future to the rest of the workshop participants. Participants also had an opportunity to review the ideas generated during the activity (Figure 9).

Activity Recap

As part of the activity recap, the peers provided their perspectives on the discussions they heard from participants. Brian Strong reported that, from the participants' feedback, it seemed like developing the futures was difficult, which can be helpful for identifying the right level of difficulty for the exercise. All of the futures involved some level of earthquake mitigation, and Strong noted that the speed at which government responds to such disasters is a critical factor. He further suggested that agencies should aim to establish systems so that, when disasters happen, they trigger immediate government response. Strong also noted that world finance will be an important factor to consider.

Figure 9: Participants review the ideas generated during the Create-a-Future™ activity. *Source: MTC/ABAG.*

Hannah Twaddell noted that extreme societal shifts toward collaborative self-governance or toward polarization and autocracy could be useful future conditions to consider in scenario planning for disaster recovery. After a traumatic event that affects a city, region, or nation, such as 9/11, there initially exists a huge outpouring of support; however at some point, if the population cannot be assured that stability will return, different population groups may start to turn on each other and become polarized. Therefore, in the long-term wake of a disaster, the risk for societal fracturing and infighting is high.

Michael Gallis emphasized the point that two of the teams identified increased income inequality as a critical factor to consider. The last recession was the greatest wealth transfer in the history of the country, as wealth shifted from individual homeowners to other entities, such as hedge funds, which displaced people relative to jobs. He emphasized that planners need to look more carefully at the issue of displacement, particularly displacement caused by sea level rise and earthquakes.

An audience member asked if all of the futures are "winnable," as some seemed dire. The peers comically noted that planners must often be optimists in order to do their jobs. The peers added that the workshop involved a lot of critical thinking at the regional level, which will be essential moving forward.

At the conclusion of Day One, the workshop participants, peers, and hosts participated in a voting exercise to evaluate the futures based on three metrics: which future is most likely to occur, which is least likely to occur, and which will MTC/ABAG be best prepared to address.

DAY TWO: Workshop Debrief and Preparing for External Forces

Day Two of the workshop included a smaller group, consisting only MTC/ABAG staff, workshop peers, and workshop planning team members. The group discussed what worked well and what could have used improvement in the previous day's exercise. MTC/ABAG staff reported that the event exceeded their expectations. MTC/ABAG received feedback that the panelists were engaging and that the Create-a-Future™ activity, while on the verge of being too complicated, had an appropriate level of difficulty for the audience.

Day Two participants also discussed what level of detail and at what step in the process it is appropriate to engage the public, especially because many stakeholders are already familiar with visioning exercises. MTC/ABAG aims to engage the public at an earlier stage than it has for previous plans. Peers suggested developing a simpler version of the game board to use to engage the public, and emphasized that messaging is just as important as analysis when engaging the public. They also noted that different economic groups will have different priorities for the region. They suggested an iterative process of involving stakeholders, experts, and the public, such as by using focus groups.

Conclusion and Next Steps

The Horizon scenario planning workshop, hosted by MTC/ABAG, brought together multiple partners and stakeholders—spanning transportation and many other sectors throughout the Bay Area—to discuss the most pressing challenges facing San Francisco Bay Area residents for years and decades to come.

Presentations by subject matter experts both within and outside of the Bay Area provided comprehensive and thought-provoking perspectives on how scenario planning can help engage planners, other stakeholders, and the public in discussions about how they envision for their community's future and help inform the next RTP update and the Bay Area's planning process as a whole.

Throughout the workshop, participants engaged in discussions to share their ideas, practices, and questions on planning for deep uncertainty and how this might be executed in the Bay Area. The Create-a-Future™ activity provided a unique opportunity to explore the many, interrelated external forces that will

shape the Bay Area in future decades and understand how these forces could eventually characterize the region as a whole.

Through verbal feedback received during the event, participants expressed that they were impressed with the subject matter expertise of workshop peers and the way in which the morning presentations sparked creative thinking during the Create-a-Future™ activity. Moving forward, MTC/ABAG will use the future scenarios that participants developed through the game to inform the next stage of their planning process, which will focus on technical analysis and public engagement on policy solutions. Ultimately, the process will inform the preferred Plan for their next RTP/SCS, Plan Bay Area 2050.

Appendices

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) 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

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C. Event Participants

Name	Organization
Salem Afangjdeh	Public Advocates
Renae Alvarez	Bay Area Regional Health Inequities Initiative
Bill Bacon	MTC/ABAG
Cathleen Baker	MTC Policy Advisory Council
Michael Barry	Federal Highway Administration
Carey Batha	Bay Conservation & Development Commission
Claire Bonham-Carter	AECOM
Ken Born	Federal Highway Administration
Josh Bradt	MTC/ABAG
Allison Brooks	Bay Area Regional Collaborative
David Burch	Bay Area Air Quality Management District
Clarrissa Cabansagan	TransForm
Paul Campos	Building Industry Association
Ellie Casson	Waymo
Ada Chan	MTC/ABAG
Tashia Clemons	Federal Highway Administration
Dale Cox	United States Geological Survey
Amber Crabbe	San Francisco County Transportation Authority
Cecilia Crenshaw	Federal Transit Administration
Michael Cunningham	Bay Area Council
Matt Davis	Port of Oakland
Martin Engelmann	Contra Costa Transportation Authority
Michael Flaxman	Geo Design
Karen Frick	UC Berkeley
Gil Friend	City of Palo Alto
Pedro Galvao	Non Profit Housing Association
Michael Germeraad	MTC/ABAG
Gillian Gillett	SF Mayor's Office
Mike Gossman	Sonoma County - Office of Recovery & Resilience
Bruce Griesenbeck	Sacramento Area Council of Governments
Ellen Griffin	MTC/ABAG
Jared Hart	City of San Jose
Darton Ito	San Francisco Municipal Transportation Agency
Doug Johnson	San Francisco Planning Department
Lisa Klein	MTC/ABAG
Jed Kolko	Indeed
Dominique Kraft	Federal Transit Administration

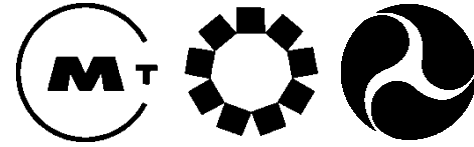| Anna Lee	Alameda County Public Health
Maria Lombardo	San Francisco County Transportation Authority
Ramses Madou	City of San Jose
Matt Maloney	MTC/ABAG
Michael McCormick	CA Office of Planning and Research
Derek McGill	Transportation Authority of Marin
Val Menotti	Bay Area Rapid Transit
Kim Nadeau	City of Santa Rosa
Adam Noelting	MTC/ABAG
Kara Oberg	MTC/ABAG
Liz O'Donoghue	The Nature Conservancy
Jenna Overton	USDOT Volpe Center
Brad Paul	MTC/ABAG
Jomari Peterson	City of Vallejo
Matt Regan	Bay Area Council
Rob Rich	MTC/ABAG
Drennen Shelton	MTC/ABAG
Mark Shorett	MTC/ABAG
Saravana Suthanthra	Alameda County Transportation Commission
Josh Switzky	San Francisco Planning Department
Laura Tam	SPUR
Jules Teglovic	MTC/ABAG
Egon Terplan	SPUR
Rachele Trigueros	Bay Area Council
Randy Tsuda	City of Mountain View
Matt Vander Sluis	Greenbelt Alliance
Dave Vautin	MTC/ABAG
Ursula Vogler	MTC/ABAG

D. Workshop Agenda

Horizon Peer Exchange
April 23, 2018 – 375 Beale St, San Francisco

Sponsored by the Federal Highway Administration
Hosted by the Metropolitan Transportation Commission & the Association of Bay Area Governments

Day 1

Time	Session	Speakers	Location
9:00 – 9:30	Registration and Check-in		Atrium
9:30 – 9:45	Welcome and Introductions	• Brad Paul Deputy Executive Director, MTC/ABAG • Matt Maloney Assistant Planning Director, MTC/ABAG • Tashia Clemons Director, Program Development, FHWA California Division • Amber Shipley Principal, Civic Edge Consulting (moderator)	Board Room
9:45 – 10:05	What is Horizon? + Futures Creation Process	• Dave Vautin Principal, MTC/ABAG	Board Room
10:05 – 10:25	Peer Presentation 1: *Decision Making Under Uncertainty*	• Nidhi Kalra Co-Director, Center for Decision Making Under Uncertainty, and Director, San Francisco Bay Area, RAND	Board Room
10:25 – 10:45	Peer Presentation 2: *New Mobility/Automated Vehicles*	• Hannah Twaddell Technical Director, Integrated Transportation Planning for Sustainable Communities, ICF	Board Room
10:45 – 11:05	Peer Presentation 3: *The Future of Jobs*	• Michael Gallis Principal, Michael Gallis & Associates	Board Room
11:05 – 11:25	Peer Presentation 4: *Resilience*	• Brian Strong Chief Resilience Officer and Director, City and County of San Francisco	Board Room
11:25 – 11:55	Q&A	• Matt Maloney Assistant Planning Director, MTC/ABAG • Amber Shipley	Board Room

Time	Session	Speakers	Location
		Principal, Civic Edge Consulting (moderator)	
11:55 – 12:00	Small Group Formation		Board Room
12:00 – 12:30	Lunch		Small Group Breakout Rooms
12:30 – 2:00	"Create a Future" Exercise	• Small Group Facilitators • Workshop Participants	Small Group Breakout Rooms
2:00 – 2:30	Break / Open House	• Workshop Participants	Yerba Buena Room
2:30 – 3:15	Report Out from Small Groups & Peers' Responses to Potential Futures	• Amber Shipley Principal, Civic Edge Consulting (moderator) • Workshop Participants • Peer Panelists	Yerba Buena Room
3:15 – 3:30	Vote on Futures	• Amber Shipley Principal, Civic Edge Consulting (moderator) • Workshop Participants	Yerba Buena Room

3:30 – 3:45	Closing Remarks	• Matt Maloney
		  Assistant Planning Director, MTC/ABAG
		• Tashia Clemons
		  Director, Program Development, FHWA California Division
			Yerba Buena Room

Small Group Breakout Room Locations

Team #	Team Name	Location
1	Yerba Buena 1	Floor 1 – Yerba Buena Room
2	Yerba Buena 2	Floor 1 – Yerba Buena Room
3	Claremont	Floor 1 – Claremont Conference Room
4	Ohlone	Floor 1 – Ohlone Conference Room
5	Redwood	Floor 5 – Redwood Conference Room
6	Alameda	Floor 6 – Alameda Conference Room
7	Santa Clara	Floor 6 – Santa Clara Conference Room
8	Mount Hamilton	Floor 7 – Mount Hamilton Conference Room
9	Mount Sutro	Floor 7 – Mount Sutro Conference Room
10	Carquinez	Floor 8 – Carquinez Conference Room
11	Farallon	Floor 8 – Farallon Conference Room

MTC and ABAG, the San Francisco Bay Area's transportation and land use planning agencies, have launched the *Horizon* initiative, previously referred to as Futures, which will allow planners, policymakers and the public to wrestle with challenging questions about the forces that could shape the Bay Area through 2050. These external forces and the potential futures—often called "scenarios"—that they could produce will be the focus of this event.

The 18-month *Horizon* effort is exploring a range of pressing issues in order to better prepare the Bay Area for the many challenges it may face between now and the year 2050. In order to create a more equitable and resilient region, planners are pursuing a "blue sky" planning approach, free of administrative or statutory requirements, to address topics ranging from transportation and land use to economic development and resilience. The end goal is to identify a series of policies, strategies and investments that will be effective in realizing the Guiding Principles of the Bay Area, regardless of what happens in the decades ahead. MTC and ABAG will integrate these strategies into *Plan Bay Area 2050*, the Regional Transportation Plan/Sustainable Communities Strategy anticipated for adoption in 2021.

Part forum, part workshop, the all-day scenario planning event sponsored by the Federal Highway Administration will feature national and regional experts speaking on topics ranging from autonomous vehicles and the future of jobs to resilience to natural disasters and sea level rise. Participants will also discuss and create a universe of approximately 10 potential futures that MTC/ABAG planners will further refine and consider this spring as part of the futures selection process for *Horizon*.

Day Two

Workshop Moderator
> Amber Shipley, Principal, Civic Edge Consulting (moderator)

Peer Panelists
> Hannah Twaddell, Technical Director, Integrated Transportation Planning for Sustainable
>> Communities, ICF
> Michael Gallis, Principal, Michael Gallis & Associates
> Brian Strong, Chief Resilience Officer and Director, City and County of San Francisco

MTC/ABAG Staff

Time	Session	Location
9:15 – 9:30 am	Registration and Check-in	Atrium
9:30 – 10:15	Review of Day One *Takeaways from "Create a Future" Exercise*	Board Room
10:15 – 10:45	Preparing for External Forces	Board Room
10:45 – 11:00	Break	
11:00 – 11:45	Workshop Debrief & Next Steps	Board Room
11:45 – 12:00 pm	Wrap-Up and Conclusions	Board Room

E.   Additional Resources

FHWA Scenario Planning Website
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/

F. Acronyms

ABAG	Association of Bay Area Governments
ART	Adapting to Rising Tides
AV	Automated vehicle
COG	Council of Governments
DOT	Department of Transportation
DMDU	Decision Making under Deep Uncertainty
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
MaaS	Mobility-as-a-Service
MPO	Metropolitan Planning Organization
MTC	Metropolitan Transportation Commission
RTP	Regional Transportation Plan
SCS	Sustainable Communities Strategy
TIP	Transportation Improvement Program
TPCB	Transportation Planning Capacity Building
USDOT	U.S. Department of Transportation