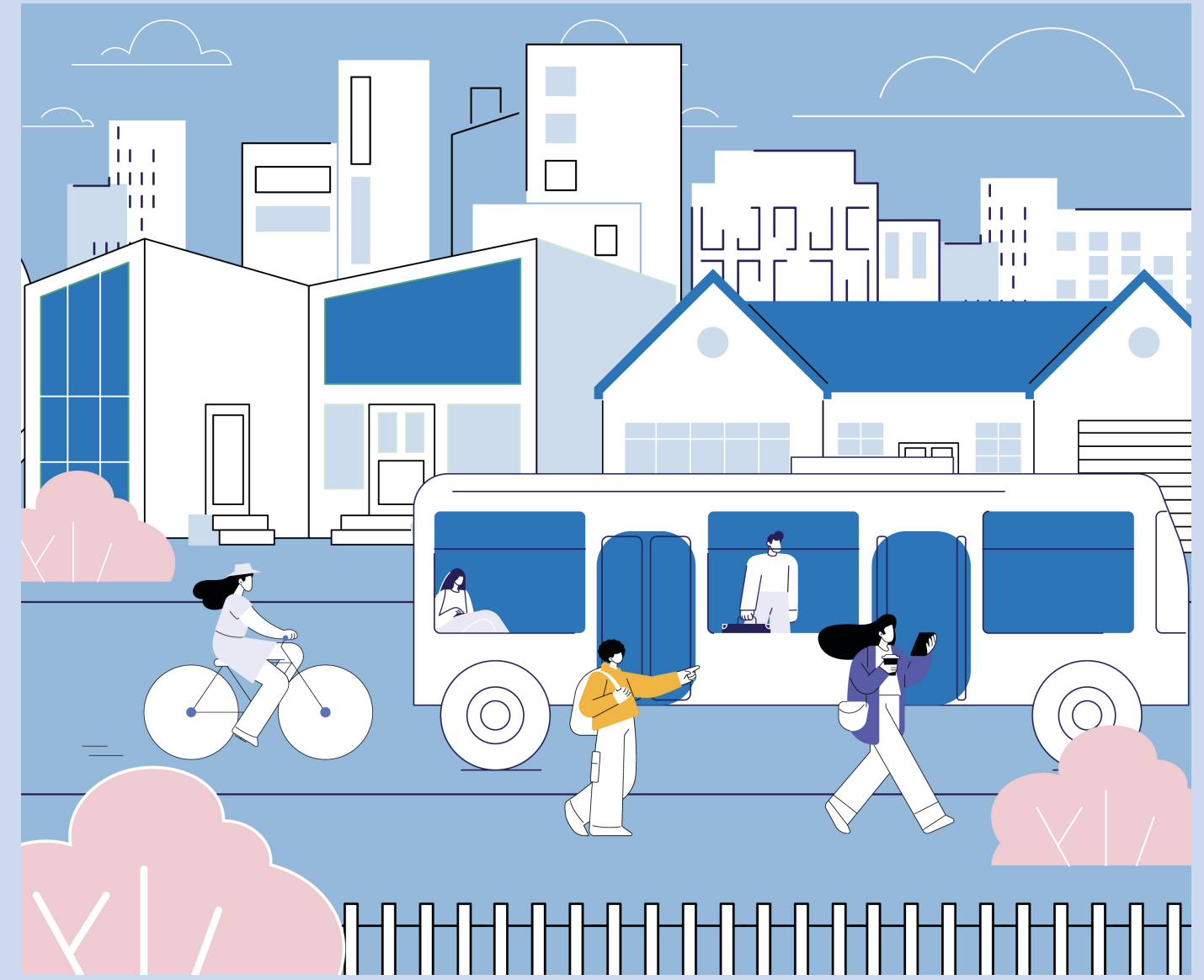


The National Transit Adaptation Strategy



SFMTA



The National Transit Adaptation Strategy

Phase I - Future Scenarios

SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY JUNE 2024



Table of Contents

List of Figures	4	Futures Phase Deliverables	22
List of Tables	5	Future Forces Report	23
Foreword	6	Future Scenario Report	26
Acknowledgments	7	Scenario 1 - Shifting to Market-Based Mobility Systems	27
Abstract	8	Scenario 2 - Pioneering a New Civic Norm	28
Executive Summary	9	Scenario 3 - Centering Resilience	29
Report Background	11	Scenario 4 - Prioritizing Social Cohesion	30
Futures Phase Development Background Steps	12	Scenario 5 - Embedding Regeneration.....	31
Futures Phase Outreach and Engagement Approach	13	Map of the Future and Toolkit	32
Foresight Workshop	14	Conclusion	33
Transit Rider/Non-Rider Interviews	14	References	34
Transportation Expert Interviews	16	Appendices	35
Cross Impact Matrix Workshop.....	17		
Expert Focus Group - City of San Francisco Board of Supervisors Aides	18		
Expert Focus Group - City of San Francisco Staff.....	18		
IDEO Session	18		
Youth Transportation Advisory Board Workshop	20		
Futures Phase Final Workshop	21		
SFMTA Senior Management Team Workshop	21		

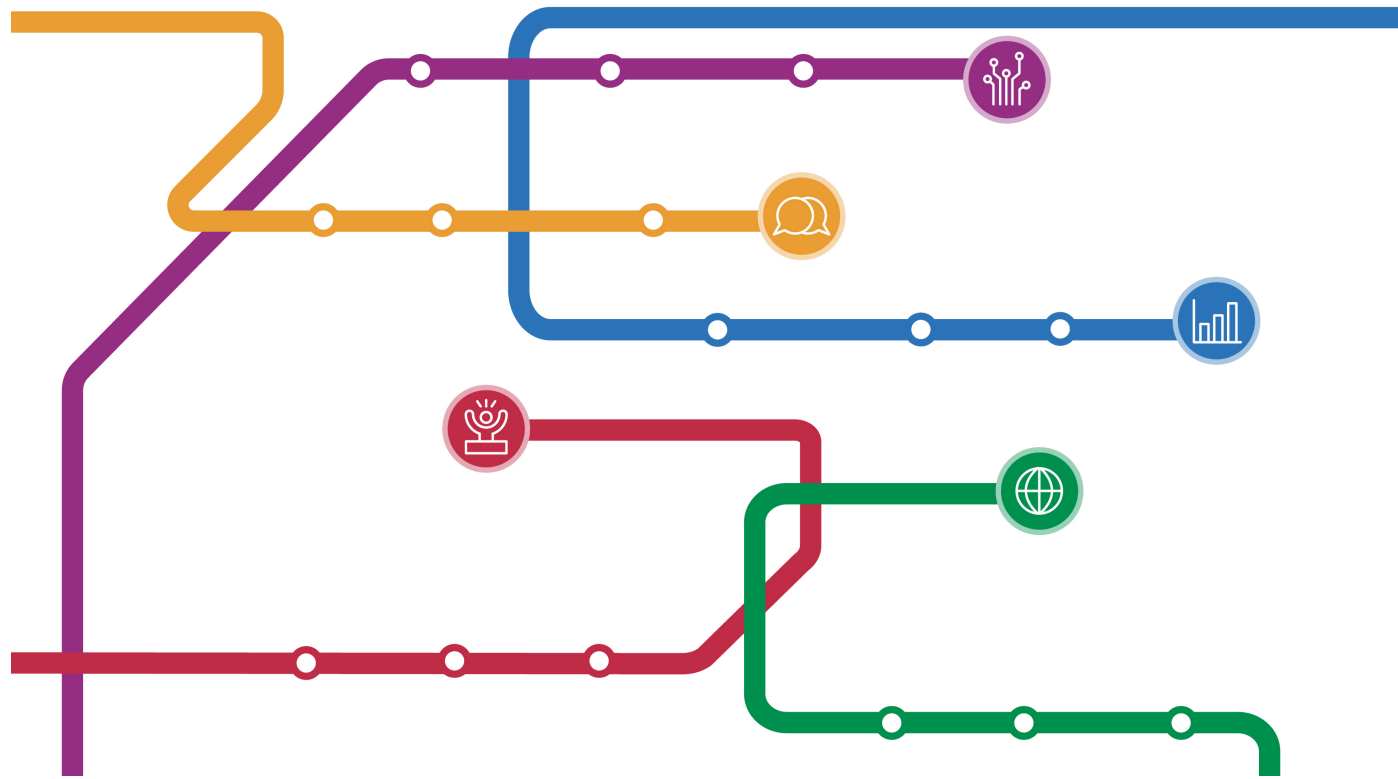
List of Figures

Figure 1.1 Range of Future Possibilities pg 11	Figure 1.2 Sample Cross-Impact Matrix pg 19	
Figure 1.3 Scenario 1 Market-Based Mobility Systems: From Public Good to Private Guest pg 29	Figure 1.4 Scenario 2 Towards a New Civic Norm: From Car-Centric to People-First pg 30	Figure 1.5 Scenario 3 Centering Resilience: Social Infrastructure for All pg 31
Figure 1.6 Scenario 4 Social Cohesion: Putting All Neighborhoods on the Map pg 32	Figure 1.7 Scenario 5 Embedded Regeneration Turning Transit Agencies into Climate Action Organizations pg 33	

List of Tables

Table 1.1 NTAS Futures Phase Foresight Methodologies pg 14	Table 1.2 NTAS Futures Phase Outreach pg 15	Table 1.3 NTAS Futures Phase Deliverables pg 24
---	--	--

Foreword



The COVID-19 pandemic exacerbated challenges that the transit industry was already facing, both in terms of ridership and financing, while also presenting new, unprecedented issues for public transportation agencies. It forced transit agencies like the San Francisco Municipal Transportation Agency to think deeply about public transportation, its purpose, and how to build on past success and look to the future.

With public transit ridership changing and subsequent revenues declining, the transit industry needs to identify ways to restore both trust and ridership as it turns its focus from pandemic response to economic recovery.

In 2021, the San Francisco Municipal Transportation Agency was awarded a Federal Transit Administration competitive grant to develop a National Transit Adaptation Strategy. The primary objective for this project is the development of tools and data-supported initiatives that any U.S. transit agency may implement to rebuild confidence in public transportation and quickly drive-up ridership.

Editor's Note: This report contains summarized information from deliverables provided by The Institute for the Future

Acknowledgments

The San Francisco Municipal Transportation Agency wishes to acknowledge the support and partnership of several organizations, agencies and individuals, who without this work would not be possible:

The Federal Transit Administration, The Institute for the Future, IDEO, members of the City and County of San Francisco Board of Supervisors Staff, SFMTA Senior Management Team, SFMTA Staff, SFMTA Youth Transportation Advisory Board, and the subject matter experts interviewed for this work (Paul Angelone, Hana Creger, Veena Dubal, Marina Gorbis, Danielle Harris, Jonathon Kass, Gabe Klein, Jonathan Levine, Toshio Meronok, Alun Rhydderch, Ryan Russo, Debs Schrimmer, Sahar Shirazi, Molly Turner, Jacob Wasserman)

Report Authors

- Darton Ito, SFMTA
- Jeanne Brophy, SFMTA
- Jonathan Rewers, SFMTA

The findings and recommendations of this report are SFMTA's and do not necessarily reflect the views of those listed below. Any errors are the authors' alone.

Contributors

- Jacques Barcia, IFTF
- Cindy Baskin, IFTF
- Jake Dunagan, IFTF
- Rod Falcon, IFTF
- Georgia Gillan, IFTF
- Ben Hamamoto, IFTF
- Sabrina Howard, IFTF
- Maureen Kirchner, IFTF
- Ilana Lipsett, IFTF
- Nathalie Lopez, IFTF

Edited by Evanne Holloway, SFMTA and Andy Gagliardi, SFMTA

Abstract

This report includes information related to the San Francisco Municipal Transportation Agency's (SFMTA) award of a Federal Transit Administration (FTA) national competitive grant to develop a National Transit Adaptation Strategy (NTAS). SFMTA, with its partners at the Institute for the Future (IFTF), Clear Channel Outdoor, Intersection, Transit app, and the Massachusetts Institute of Technology (MIT), have developed a set of tools to support the public transportation industry's resiliency and adaptation through and beyond the COVID-19 pandemic.

Work and travel patterns have shifted, some permanently, and as SFMTA and other transit agencies look to the future of transportation, they will need to consider a range of factors affecting transportation ridership and trust. The COVID-19 pandemic exacerbated challenges that the transit industry was already facing, both in terms of ridership and financing, while also presenting new, unprecedented challenges. Ridership is the key metric for any public transit organization; and national transit ridership was already falling well before the COVID-19 pandemic. With public transit ridership - and subsequent revenues - declining, the transit industry must identify ways to restore both trust and ridership as it turns its focus from pandemic response to economic recovery.

The goal of the NTAS is to provide public transportation agencies with tools to rebuild public confidence in the transit services they provide and to build resilient public transportation systems.

The primary objective for this project is the development of tools and data-supported initiatives that any U.S. transit agency may implement to rebuild confidence in public transportation and quickly drive-up ridership. There are four key deliverables included in the strategy:

1. Futures report that realistically identifies what the future will bring to set a path toward the most probable future scenario.
2. Ridership profiles and personas that provide the industry with key market segments to manage their systems to, and thereby support operational efficiency.
3. Specific marketing campaigns and messaging, which can be replicated and targeted to a particular rider persona and the future scenario anticipated by a transit system.
4. Ridership model for transit agencies to assess potential ridership scenarios based on a range of potential initiatives.

Executive Summary

In FY 2020, the FTA issued a NOFO "The Public Transportation COVID-19 Research Demonstration Grant Program," and in FY 2021 awarded the SFMTA funding (Grant # CA-2021-183/SFMTA Project C19) for the NTAS. A summary of the Futures phase of this project is provided in this report.

Now is the time to anticipate the future of public transit. The COVID-19 pandemic exacerbated unprecedented challenges that the transit industry was already facing, both in terms of ridership and financing, while also making visible the cascading and intersecting crises of climate change, racial reckonings, and economic and social inequalities in society at large.

Human behavior patterns have shifted, and public transit agencies nationwide need resources to understand those shifts and their implications on transit service planning and use of innovative technologies to rebuild transit ridership. Ridership recovery and service adaptation across the country is fragmented, far below pre-pandemic levels, and continues to compound the funding challenges agencies faced prior to the pandemic. Working from home, health and safety concerns, and shifts in daily routines have all pulled riders away from public transportation, leaving public transit systems and agencies in a precarious position.

In partnership with the Institute for the Future (IFTF), the SFMTA outlined a Futures phase of the NTAS to identify strategies to restore confidence and ridership in public transportation.

Figure 1.1 Range of Future Possibilities

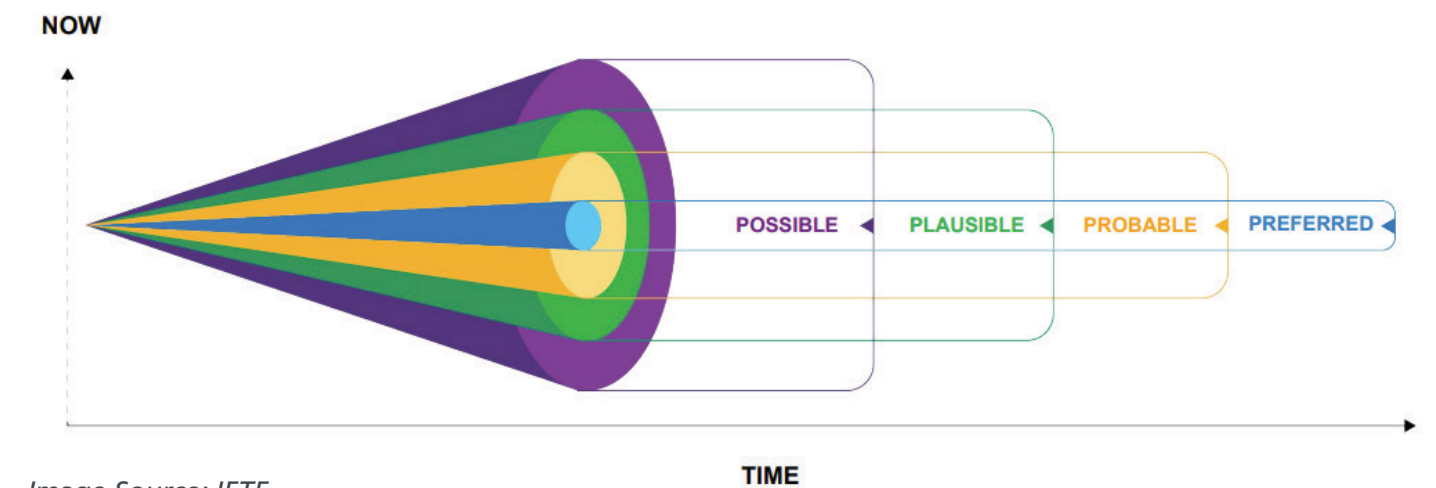


Image Source: IFTF

The Futures phase of the NTAS held two concurrent work streams, where IFTF led the development of a set of foresight tools and forecasts for public transit agencies and SFMTA led the validation of future forces through outreach and engagement.

IFTF used strategic foresight methods, decades of research experience, and interviews with experts and stakeholders to identify critical forces that are shaping the future. IFTF interviewed subject-matter experts in transportation, land use, climate, infrastructure, and government - including SFMTA and San Francisco government workers - and spoke with users and potential users of public transportation. Through these research and interview sessions, IFTF uncovered insights, connections, barriers, and constraints, all key to building transit system resilience.

Report Background

As part of the larger NTAS project, IFTF created the following reports:

Futures report that realistically identifies what the future will bring to set a path toward the most probable future scenario.

Ridership profiles and personas that provide the industry with key market segments to manage their systems to, and thereby support operational efficiency.

Specific marketing campaigns and messaging, which can be replicated and targeted to a particular rider persona and the future scenario anticipated by a transit system.

Ridership model for transit agencies to assess potential ridership scenarios based on a range of potential initiatives.

These three reports are intended for public transit agencies to use in their own strategy discussions for responding and adapting to demands and realities of the next decade as public service providers.

SFMTA used community engagement and mix-method research to lead a series of outreach and engagement initiatives with the purpose of understanding sentiment towards the future of public transit including a series of workshops with SFMTA staff, an event hosted by IDEO in Cambridge, Massachusetts, a workshop with the SFMTA Youth Transportation Advisory Board (YTAB), and with senior management at the SFMTA.

With ridership continuing to be the key metric for any public transit agency, public transit agencies must identify ways to restore and renew both trust and ridership as they shift focus from responding to the pandemic to discerning the role of public transport in a larger story of economic recovery, climate action, and social and racial justice. The transit industry must look at a range of factors, including improvements in efficiency and targeted investments, to drive ridership and revenues back up and act now for the long-term renewal of infrastructure and the promise of public service.

In response to these challenges, the NTAS provides strategic understanding of ridership and provides a framework designed to help the public transportation industry navigate and plan for the post-pandemic era.

The primary objective of this project is to equip U.S. transit agencies with tools and data-supported initiatives that will help rebuild public confidence in public transportation with a goal of sustaining and increasing ridership. The NTAS delivers four critical components:

1. A futures report that offers a realistic outlook on the future, allowing transit agencies to prepare for the most probable future scenarios. This report goes into the background, approach, and key findings from this phase.
2. Ridership profiles and personas that identify key market segments for managing transit systems effectively, thereby enhancing operational efficiency.
3. Specific marketing campaign and messaging for a possible future scenario.
4. A data-based ridership model that provides a quantitative intervention analysis on transit ridership, enabling transit agencies to evaluate the impact of transit interventions on ridership.

The NTAS will empower transit agencies across the United States with the knowledge, tools, and strategies needed to rebuild ridership, increase public trust, and adapt to the changing landscape of public transportation.

In 2021, SFMTA partnered with IFTF, a non-profit think tank with over 50 years' experience in foresight methodologies, to provide a set of tools to support the public transportation industry's adaptation through and beyond the pandemic.

As part of the initial phase of work, IFTF created three reports:

1. The **Future Forces** report was developed using strategic foresight methods to investigate the major drivers and signals of change that are demanding strategic responses. Through research and expert interviews, this effort identified the social, technological, economic, environmental, and political forces that are shaping our shared tomorrow.
2. The **Future Scenarios** report describes five scenarios that point towards distinct, plausible ways in which the future of public transit may unfold over the next 10 years. IFTF used the Alternative Futures framework to push the edges of what's possible and provoke stakeholder imagination to think through the future of public transit through scenarios of growth, constraint, collapse, and transformation.
3. The **Map of the Future and Toolkit** is an interactive tool that brings together the Future Forces and Future Scenarios, providing a comprehensive view of potential futures that can be useful in identifying opportunities and threats, possible zones of innovation, and strategic responses to a changing landscape.

Futures Phase Development Background Steps

IFTF's goal was to explore what it means to build a future-ready public transportation agency that embeds foresight in its plans for rapidly changing rider needs, climate-related shocks, or drastically altered commute patterns resulting from new ways of working. The result of this partnership includes research on the major drivers of change and disruptions to public transportation in recent years, a set of future scenarios, and a toolkit for transportation agencies to engage the public in their strategic thinking to tackle current challenges and build a more robust and resilient transportation system for the future.

Futures thinking is a set of strategic and creative tools that help anticipate how the future might be different and why. This phase of work utilized a STEEP analysis (Social, Technological, Environmental, Economic, Political), which categorizes external factors to understand their impact and influence and opens a path to analyze the past and predict the future.

The IFTF team utilized three foresight methodologies at the center of the research: a cross impact matrix, ethnographic foresight, and scenarios.

Table 1.1 NTAS Futures Phase Foresight Methodologies

Framework	Purpose
Cross Impact Matrix	<ul style="list-style-type: none"> Creates juxtaposing forecasts across a wide variety of "impact zones" to visualize complex, intersectional futures and identify threats, opportunities, and critical insights Used to understand how large-scale changes might impact an entire community, organization, or industry
Ethnographic Foresight	<ul style="list-style-type: none"> Anticipates emergent futures by understanding the values, behaviors, and toolsets of future-facing people in the context of their daily lives Used to uncover signals or stories of how people are experiencing the present in ways that are likely to grow and have increasing importance in the long-term future
Scenarios	<ul style="list-style-type: none"> Scenario building provides a framework to organize signals, drivers, and foresight into clear paths to the future

Futures Phase Outreach and Engagement Approach

IFTF and SFMTA conducted interviews, workshops, and industry outreach to develop a deep understanding of the existing landscape in transit and gather inputs on signals and drivers of change.

Attendee information for outreach sessions is listed in Appendix 1.

Table 1.2 NTAS Futures Phase Outreach

Date	Activity	Lead Agency
November 2021	Foresight Workshop	IFTF
February 2022	Transit Rider/Non-Rider Interviews	IFTF
February 2022	Transportation Expert Interviews	IFTF
March 2022	Cross Impact Matrix Workshop	IFTF
March 2022	Expert Focus Group - City of San Francisco Board of Supervisors Aides	IFTF
March 2022	Expert Focus Group - City of San Francisco Staff	IFTF
September 2022	IDEO Workshop	SFMTA
December 2022	Youth Transportation Advisory Board Workshop	SFMTA
December 2022	Futures Phase Final Workshop	IFTF
December 2022	SFMTA Senior Management Team Workshop	SFMTA

Foresight Workshop

When: November 19, 2021

Who: SFMTA Staff and IFTF

Purpose / Intended Outcome(s): The November 2021 workshop brought together SFMTA stakeholders and IFTF staff to provide a project overview and align on the futures phase and research, immerse attendees in futures thinking methodologies and concepts, and identify future forces, disruptions and possibilities that could shape the future of public transportation. This workshop provided a foundation for future phases of the project.

Methodology: This was an IFTF-lead discussion-based workshop to identify futures thinking frameworks and begin generating concepts to guide initial research.

Summary / Synopsis: Key take-aways for what ‘futures thinking’ means to transit agencies, future forces and drivers to consider throughout the research, and impact areas that should be considered in the cross-impact matrix. The slides presented during this workshop are included as Appendix 2.

Transit Rider/Non-Rider Interviews

When: February 10, 16, 17, 2022

Who: Muni Riders, Non-Riders, and IFTF

Purpose / Intended Outcome(s): The goal of these small group interviews with infrequent transit riders and current non-riders was to hear a diversity of stories and perspectives, to understand the individual’s decision-making process, reflections on what their transit journey looks like today, how it might change, and what is needed for them to use transit more frequently. As such, the interviews did not seek to be representative of Muni riders.

Methodology: IFTF conducted a series of three

To further understand sentiment during the session, IFTF prompted SFMTA staff with several questions to respond to on a 10-point scale with 1 bringing us together and 10 pulling us apart.

1. *On a scale of 1–10 is technology bringing us together or pulling us apart (1 is bringing us together, 10 is pulling us apart).* Participants’ responses ranged from 3 to 9, with 5 being the most frequently reported response.
2. *Over the next 10 years, car ownership in San Francisco will either: 1 decrease, 5 stay the same, 10 increase.* Participants’ responses ranged from 1 to 7, with 5 being the most frequently reported response.
3. *In 10 years, there will be more or fewer mobility options (1 fewer mobility options, 10 more mobility options).* Participants’ responses ranged from 5 to 9, with 7 being the most frequently reported response.

virtual group interviews with Bay Area residents who are infrequent public transit users with an effort to listen to as many voices as possible of people who may have a unique view into the new realities of using public transportation.

The objectives of this research were to:

- Understand participants’ relationship to transit in both the pre- and post-pandemic contexts.
- Understand the factors that shape decision making, whether or not to take public transit and how price, convenience, safety, among other factors matter in their decisions.

- Understand participants’ transit journeys (e.g., planned vs. unplanned) and the various entry points, turning points, milestones and interruptions that shape them.
- Understand participants’ views on the major system barriers that SFMTA will have to overcome to increase ridership in the post-pandemic context.
- Understand how participants envision the future of mobility in the Bay area.

The interview guide is included as Appendix 3. Group interviews took place on February 10, 16, and 17, and lasted two hours each.

Participants were recruited via Craigslist and SFMTA’s listserv; participants were invited to fill out a survey, and then the IFTF team selected a subset of individuals for phone screening, from which the final group was pulled based on the criteria described below. All group interviews followed the same format: the first half was designed for an open sharing of individual transit journeys and their approach to critical decisions in those journeys, while the second half was designed for deliberate futures work, encouraging the participants to share their feedback on the present system and extrapolating out to a ten-year landscape.

554 survey responses were received. Of these, 206 were excluded based on not residing in a Bay Area County (n=19) and frequent public transportation use (n=187).

82 people were contacted and successfully screened (39) based on the following criteria: 1) Bay Area resident; 2) occasional or non-public transit user; 3) commute modality, and 4) conversational ability and interaction level. As a result of this screening process, 28 people were invited to participate in the interviews.

A total of 23 people participated in the three group interviews.

Summary / Synopsis: Five key themes emerged from the rider and non-rider interview sessions:

1. Convenience / Inconvenience. While some participants cited “convenience” as their reasoning for using public transit, others cited “inconvenience” as a deterrent. These terms were used by participants to describe a variety of experiences including: 1) having to wait too long for buses and trains, 2) not being able to access stations and bus stops easily, 3) not having the space and resources to work during rides, 4) saving money, and 5) not having to look for parking.
2. Safety. In line with previous research, safety emerged as a major point of concern for participants. Participants expressed health/cleanliness and physical safety concerns when waiting for and riding public transit.
3. Stigma. Participants highlighted the stigma that often surrounds public services and those who use them.
4. Limited Awareness of Coordination Apps. When discussing deterrents to use public transit and how they might be addressed or eliminated, participants often expressed a desire for information technology that is already readily available.
5. Leaving the Bay. Roughly half of the participants expressed they do not see themselves living in the Bay Area in 10 years for multiple reasons ranging from cost of living to wanting to live back home.

Transportation Expert Interviews

When: Throughout February 2022

Who: Transportation Experts and IFTF

Purpose / Intended Outcome(s): These interviews were with relevant experts whose knowledge and expertise were helpful in thinking through possibilities for the future of transit in San Francisco. Interviewees were asked to speculate on future possibilities, as well as share insights about current issues that are likely to be important to transportation in the future. The information provided was used as background information to inform IFTF’s thinking as they developed materials to support governments in making more ethical decisions around technology.

Methodology: IFTF conducted 15 interviews with subject matter experts in February 2022. The interview guide is included in this report as Appendix 4. The interviewed individuals’ areas of expertise are directly or indirectly related to public transportation, and their areas of practice include land use and urban planning policy, smart cities, start-ups, micro-mobility and rideshare, municipal and state government. Their backgrounds include government, academia, industry, non-profit, start-ups, business, journalism, and technology.

Each interview was 60 minutes and was conducted by one of three members of the IFTF team.

Summary / Synopsis: Themes that emerged from these interviews reinforce the fact that public transportation plays a critical role in a holistic—and systematic—approach to support a city’s goals and values, supporting everything from economic inclusion to climate goals to quality-of-life aspirations.

Six key themes emerged from the expert interview sessions:

1. Focus on Core Services. Transit agencies should think holistically about building a system that will

achieve an intentional set of goals, rather than worry about the next technology.

2. Coordinate a Multi-Modal Transit Ecosystem. All interviewees highlighted the importance of coordination between modes of transportation as critical to creating a positive experience for residents.
3. Value Capture and Revenue Generation. Several interviewees gave examples of other agencies that have leveraged income generating opportunities from the right of ways that they own, or through other financial structures.
4. Participation and Equity. Some interviewees highlighted the importance of participatory policy and design, both creating processes that are accessible and engaging for the public, but also flagging that structural issues preventing people from having the capacity to participate need to be addressed.
5. Systemic Context and Constraints. While the number of systemic issues impacting transit implies that many preferred futures require bigger change that goes beyond the purview of SFMTA, it is impossible to divorce the conversation of the future of public transportation from the intersection of other key issues, namely climate, infrastructure, homelessness and housing, politics, and land use policy.
6. Changing Nature of Work and Impact on Mobility. The changing nature of work and the centrality of the workplace in people’s lives is changing at the same time. IFTF sees a shift toward the rise of the independent worker and calls this the “second curve of work,” from institutionalized to non-institutionalized work.

Cross Impact Matrix Workshop

When: March 22, 2022

Who: SFMTA Staff and IFTF

Purpose / Intended Outcome(s): IFTF facilitated a collaborative workshop designed to move from foresight to insight on the futures phase of NTAS. IFTF organized and presented the foresight research to date on a matrix. The forecasts were articulated as shifts organized into the STEEP (e.g., social, technology, economic, environmental, and political) framework. Together, these shifts (e.g. rows on the matrix) gave shape to the emerging operational environment over the next decade.

Methodology: Virtual presentation and Miro activity

Summary / Synopsis: The workshop asked participants to consider STEEP shifts and identify insights or implications across a range of impact areas (e.g. columns on the matrix). These impact areas or zones allowed for distinguished and developed categories of insights or impacts that could influence actions in the present to positively impact ridership and manifest a preferred vision for the future. The workshop presentation is included as Appendix 5.

Table 1.2 Sample Cross-Impact Matrix

STEEP Category	Markets	Services	Decision Making	Risks	Funding
Social					
Technology					
Economic					
Environmental					
Political					

Participants came away from the session with two key themes to achieve the city’s goals: Six key themes emerged from the expert interview sessions:

1. A “transit first” mentality and focus on reliability and what SFMTA already does well.
2. Good, discounted fare programs and making the service affordable to all.

Expert Focus Group – City of San Francisco Board of Supervisors Aides

When: March 2022

Who: City of San Francisco Board of Supervisors Aides and IFTF

Purpose / Intended Outcome(s): IFTF facilitated a focus group with Board of Supervisors Aides designed to generate insights and test hypotheses about the future of transportation from the transportation leads for San Francisco elected officials.

Methodology: Virtual presentation and Miro activity

Summary / Synopsis: The top six issues facing San

Francisco’s transit network according to

BoS Aides were:

- Multi-modal transit ecosystem
- Mobility Justice and Universal Basic Mobility
- People-first cities
- Intersectional and systemic solutions
- Radical reshaping of movement in urban spaces
- Beyond sustainability to regeneration

Expert Focus Group – City of San Francisco Staff

When: March 2022

Who: City of San Francisco Staff and IFTF

Purpose / Intended Outcome(s): IFTF facilitated a focus group with City Staff designed to generate insights and test hypotheses about the future of transportation.

Methodology: Virtual presentation and Miro activity

Summary / Synopsis: The top six issues facing San Francisco’s transit network according to City Staff were:

- Changing nature of work
- Multi-modal transit ecosystem
- People-first cities
- Privatization and public-private partnerships
- Intersectional and systemic solutions
- Radical reshaping of movement in urban spaces

IDEO Session

When: September 2022

Who: SFMTA Staff, IDEO Staff, NACTO Conference attendees, transportation scholars, transportation students, transportation officials, IDEO clients in the mobility sector.

Purpose / Intended Outcome(s): In fall 2022, during the National Association of City Transportation

Officials (NACTO) Designing Cities Conference in Boston, SFMTA partnered with IDEO, a design and innovation company, to host a workshop at IDEO’s Cambridge office to test some of the futures insights developed. The goal of this in-person session was to inform futures forecast and preliminary persona work.

Methodology: IDEO moderated the one-hour event and conversation using an approach called Creative

Tensions. Creative Tensions is a method for collective conversation, expressed in movement. Participants reveal where they stand on an issue by where they stand in the room.

Summary / Synopsis: The session included five questions and discussion rounds:

1. I use public transit... For convenience <<<>>> Out of principle
 - Most attendees oriented themselves more towards “for convenience” citing parking availability as a decision factor, transit being less family friendly, and purchasing a car during the pandemic.
2. Public transit will recover because... External forces will drive usage (recession, return to commuting, legislation) <<<>>> We will reshape our systems and services
 - Attendees oriented themselves throughout the room to indicate a more nuanced response.
 - Those that selected “external forces” cited public transit’s connection to land use, and that external forces are what create the system.
 - Those that selected “we will reshape our systems and services” shared they were encouraged by internal transit initiatives focused on transit recovery.
3. Public transit today attracts riders because... It is convenient <<<>>> They have no other choice
 - Most attendees oriented themselves towards “they have no other choice” highlighting that the people who are still riding public transit have no choice and there has been a loss of riders to other modes like bicycles.

4. Public transit today loses riders because... Old destinations are no longer a draw <<<>>> New destinations are not served by transit
 - Once again, attendees oriented themselves more throughout the space.
 - For those that selected “old destinations are no longer a draw”, participants shared that fewer people are going downtown and there are less destinations downtown.
 - For those in the middle, participants cited concerns of safety and how public transit systems cannot keep up with sprawl as people move away from traditional job centers.
 - Participants that felt “new destinations are not served by transit” expressed that new options are needed and that new origin points were also not considered.

5. Public transit today misses out on potential riders because of... Cost <<<>>> Quality
 - Most of the room oriented around “quality” citing experience, frequency, and system sustainability as factors for this choice.

Youth Transportation Advisory Board Workshop

When: December 12, 2022

Who: SFMTA Staff and the SFMTA Youth Transportation Advisory Board (YTAB)

Purpose / Intended Outcome(s): SFMTA staff consulted with YTAB members to gain perspective on the Futures Phase of the NTAS work and preview the Personas phase.

Methodology: A slide presentation and typeform survey activity.

Summary / Synopsis: Young people have a unique relationship with transportation that makes them particularly sensitive to changes in services and programs. The SFMTA YTAB seeks to specifically amplify the perspectives of local youth - aiming to explicitly and intentionally elevate the lived experiences of young people from across the city of San Francisco to better inform policies and practices.

To further understand sentiment during the session, SFMTA staff prompted YTAB members with several questions to respond to on a 10-point scale with 1 bringing us together and 10 pulling us apart.

1. *On a scale of 1 – 10 public transit today attracts riders because it is convenient or they have no other choice (1 is because it is convenient, 10 is they have no other choice).* Participants' responses ranged from 2 to 120F1, with 3, 4, and 7 being the most frequently reported responses.
2. *On a scale of 1 – 10 public transit today loses riders because old destinations are no longer a draw or new destinations are not served by transit (1 is because old destinations are no longer a draw, 10 is new destinations are not served by transit).* Participants' responses ranged from 1 to 10, with 8 being the most frequently reported response.
3. *On a scale of 1 – 10 public transit today misses out on potential riders because of cost or quality (1 is because of cost, 10 is because of quality).* Participants' responses ranged from 1 to 9, with 1 being the most frequently reported response.
4. *On a scale of 1 – 10 speed, reliability, and convenience are the answer or are not enough (1 is the answer, 10 is not enough).* Participants' responses ranged from 1 to 10, with 7 being the most frequently reported response.

Futures Phase Final Workshop

When: December 5, 2022

Who: SFMTA Staff and IFTF

Purpose / Intended Outcome(s): This session acted as an official hand off for IFTF deliverables as well as an opportunity for SFMTA staff to use the tools within the IFTF deliverables to imagine and plan for a potential future.

Methodology: A virtual presentation and breakout sessions.

Summary / Synopsis: IFTF shared key learnings from the development of the NTAS Futures Phase deliverables. Participants were asked to select a Future Force and a Future Scenario and answer these questions:

- What would it mean for you if this scenario (or elements of this scenario) came to be?
- What would you need to do differently? How might you prepare/are you preparing for this future?
- Potential structure: what are your concerns with this scenario? What do you disagree with? Where does this fail? If this were to be true, what would you keep doing, stop doing, and change?
- Desired outcome for SFMTA staff? Radical reshaping of movement in urban spaces
- Beyond sustainability to regeneration

SFMTA Senior Management Team Workshop

When: December 19, 2022

Who: SFMTA Senior Management Team (SMT)

Purpose / Intended Outcome(s): A briefing for the SFMTA SMT to update the group of progress and status of the work.

Methodology: A workshop with discussion and slide presentation.

Summary / Synopsis: The session included a review of the personas research up to that point, and then a deeper dive into the futures forecast work that IFTF had created, as well as a review of the conversations at the IDEO and YTAB workshops.

Futures Phase Deliverables

In partnership with SFMTA, IFTF created three deliverables for the NTAS to inform and support U.S. transit agencies efforts to increase ridership and resiliency within their systems.

Table 1.3 NTAS Futures Phase Deliverables

Deliverable Title	Deliverable Purpose
Future Forces Report	From this report, transportation agencies will be able to gain a better understanding of the forces that will shape public transportation over the next decade, so that they can make future-focused decisions today to prepare for an uncertain future.
Future Scenarios Report	This report presents five future scenarios for public transit agencies that point towards distinct, plausible ways in which the future of public transit may unfold over the next 10 years. The future of transportation and public transit systems will likely contain elements and trends from each of these five scenarios. The report aims to provoke stakeholder imagination and support their evaluation of scenarios of growth, constraint, collapse, and transformation.
Map of the Future and Toolkit	An interactive tool that brings together the Future Forces and Future Scenarios. Transit agencies are invited to tailor details of the future forces, impact zones, or scenarios to the unique characteristics of their agency, city, and public transit system, and use this map and toolkit as a starting point for exploring future possibilities in their own location.

Future Forces Report

Combining industry research, expert interviews, and stakeholder interviews, the Future Forces Report [Appendix 6] identifies the social, technological, economic, environmental, and political (STEEP) forces that are quickly shaping our shared tomorrow.

Each domain contains an overarching story that describes these directions of change, followed by examples (signals) of future forces within that domain. Examples of signals include:

- Harnessing heat from trains for homes and offices. At Geneva’s Lancy-Bachet station, heat generated by trains and brakes is collected by polyethylene pipes embedded in the tunnel walls and tracks and injected into the district heating network to heat nearby apartments and offices.
- Universal Basic Mobility. Inspired by the universal basic income pilots, several cities in California are piloting a “universal basic mobility” program to close the unemployment and school absence gaps. Residents will be selected to participate in various city-wide studies that give subsidized access to public transportation, e-scooters, and e-bikes. The programs aim to understand how having a minimum guaranteed level of transportation could change economic outcomes for people.
- Installing solar on underutilized assets pays off. A school district in Arkansas bought solar panels and installed them in a vacant field to power its district—this move saved enough money to add \$15,000 to each teacher’s paycheck.

These future forces paint pictures of multiple, often divergent, possible futures. Each domain also looks at the forces through the lens of the five impact zones for deeper implications for SFMTA and transit agencies broadly. The impact zones were clarified through research and interviews conducted by IFTF with subject-matter experts as critical focal points

for identifying threats and opportunities for transit systems.

The Future Forces report offers six key questions to gauge the possible directions of change for transit providers:

1. How might the agency’s assets be part of larger efforts to address the climate crisis?
2. What role can a transit agency play in a city’s circular economy?
3. What existing assets could be retrofitted to enable them to generate renewable energy?
4. How can the agency support mental health and the care economy?
5. How can the agency monetize existing assets and form public-private partnerships as other avenues to bring in revenue?
6. What leverage does the agency have to advocate for people-first streets and more housing? the independent worker and calls this the “second curve of work,” from institutionalized to non-institutionalized work.

In this report, IFTF approached the research for the future forces work using the STEEP Framework. The Future of Transportation Future Forces report explains interactions and combinations of a broad range of forces that influence change. The research, analysis, and collected signals within this report aims to inform SFMTA and other public transportation agencies about the ways in which different futures present challenges and opportunities for the future of public transportation.

The Future Forces report is organized by five (forces) domains:

1. SOCIAL - Radical reshaping of human movement through urban spaces
2. TECHNOLOGICAL - Cautious embrace of exponential opportunity
3. ECONOMY - Precarity, privatization, and competing priorities
4. ENVIRONMENTAL - Root problems need root solutions
5. POLITICAL - Identity politics fuel mobility choices

Within each domain, the Future Forces report outlines five impact zones to be considered:

1. SOCIAL - Radical reshaping of human movement through urban spaces
2. TECHNOLOGICAL - Cautious embrace of exponential opportunity
3. ECONOMY - Precarity, privatization, and competing priorities
4. ENVIRONMENTAL - Root problems need root solutions
5. POLITICAL - Identity politics fuel mobility choices

A more sustainable transportation future is complex, multifaceted, and dynamic. Together, the forces and signals offered in this report tell the story of a world that needs public transportation more than ever.

These stories present a range of opportunities for public transportation to take on a new narrative across categories, including:

1. **SOCIAL** - for public agencies to be a solution to the mental health crisis.
 - How can public transit agencies help people connect their individual experiences to a collective greater good?
 - How might public transit agencies support care and healing work?
2. **TECHNOLOGICAL** - for transportation systems to be part of the clean tech economy where their assets generate renewable energy.
 - How might public transportation agencies balance exploring adopting new technologies with the need to focus on core capabilities and offerings?
 - How can existing technologies and assets contribute to climate solutions?
3. **ECONOMIC** - to play a critical role in addressing economic inequality by considering Universal Basic Mobility programs, or to supplement agency budgets by monetizing infrastructure and other assets.
 - What might it take for public transit agencies to implement permanent universal mobility programs?
 - What offerings can you consider privatizing while still retaining control over operations?

4. **ENVIRONMENTAL** - to be part of a region's circular system, minimizing waste or redirecting it to be a needed input.

- How can public transportation infrastructure and assets be places that heal people and the planet?
- Where can public transit agencies partner with companies and community groups to help them reduce their carbon footprint?

5. **POLITICAL** - to show a viable alternative to a car-centric city, demonstrating how people-first streets can coexist with public transportation.

- Where might you have leverage in city-wide planning to partner with agencies who do have authority to make the changes that will benefit public transportation and benefit society?

From this report, transportation agencies will be able to gain a better understanding of the forces that will shape public transportation over the next decade so that they can make future-focused decisions today to prepare for an uncertain future. The content is designed to provoke insights about how things might change to better prepare for unpredictable futures, and to provide a framework for meaningful discussions about these futures.

Future Scenario Report

The NTAS Future of Transportation Five Scenarios Report [Appendix 7] presents a series of provocative, internally consistent future possibilities for transit. The Future Scenarios Report builds on the initial Future Forces report by presenting scenarios pointing towards distinct, plausible ways in which the future of public transit may unfold over the next 10 years. Each scenario has a strong throughline that optimizes a particular set of values to play out directions for the future of transportation. These values — profit / monetization, human-centeredness, resilience, equity, and regeneration — offer different ways to transform transportation and public transit agencies. These values were synthesized by the IFTF on behalf of the SFMTA from expert interviews and future-forces research and chosen for their range and transformative potential.

These public transportation scenarios are not predictions. Nor are they necessarily preferred futures. In strategic foresight work, IFTF uses scenarios as a framework to dramatize different and plausible trajectories of change. Although these futures are often radically different from our current world, they are generated from signals of change that exist in the present.

The future of transportation and public transit systems will likely contain elements and trends from each of these five scenarios.

Scenario 1 – Shifting to Market-Based Mobility Systems

Imagine the future of public transit as it finds financial sustainability through market- and profit-driven approaches. A focus on revenue and profit generation remains sharp as cities respond to the re-prioritization

of work to drive economic recovery, expanding automation, smart environments, the reclamation of streets from cars, and increased demand for transit-friendly housing.

Figure 1.3 Scenario 1 Market-Based Mobility Systems: From Public Good to Private Gues



Image Source: IFTF

Focusing on profit turns attention away from money-losing routes, services, and investments, and toward high margin services and sometimes draconian cost-cutting measures. Running a public transit system for profit leaves the poor and marginalized behind. Barring tempering factors, this approach likely exacerbates systemic racism and worker injustice while favoring

corporate partners and wealthy users. We've seen this happen in medicine, education, and other domains that were once public goods rather than profit-centered businesses. Services are excellent for those who can afford them, and it is argued that a private, profit-focused system is better than no public transportation system.

Scenario 2 - Pioneering a New Civic Norm

What if transportation policy could put people first and disincentivize car ownership? Imagine a future where micro-mobility takes off at the neighborhood level, the new metric of success is livability, and where people can access what they need for living: transportation,

food, work, culture, art, and entertainment. This future emerges as cities look for ways to tackle the big problems of deteriorating living conditions, increasing inflation and the cost of living, and the persistent rise in houselessness.

Figure 1.4 Scenario 2 Towards a New Civic Norm: From Car-Centric to People-First



Image Source: IFTF

A people-first, subsidized transit system requires a radical rethinking of policy and funding priorities. Any money savings from decreasing policing and other services have met with resistance. Temporary increases in crime (or even the perception of an increase in crime) have put political pressure on decision-makers to not trade public safety for cost savings. In the end,

a publicly subsidized system has won the day because most of the public prioritized access and equity to achieve a shift in car centrality and new civic norms. The classic philosophical debates of individual freedom vs. collective responsibility continue to rage, but a highly functional, widely accessible transit system has dramatically changed behavior and attitudes.

Scenario 3 - Centering Resilience

Imagine public transit and transportation as a lever for building resilience and future-readiness. After a decade of extreme weather, social instability, and the unaffordability of everyday life, cities embrace the principles of equity, sustainability, and foresight to respond to calls for justice. Cities amplify the idea of

“social infrastructure for all,” making public education, public safety, public health, public space, and public transportation universally available to all. Starting with universal basic transportation benefits, a new road to resilience comes into view where the city works better for all.

Figure 1.5 Scenario 3 Centering Resilience: Social Infrastructure for All



Image Source: IFTF

Policymaking through a community first, resilience-based lens allows governments to operate and plan for the long term. Citizens feel supported by local and state governments because they see how policy changes prioritize their needs. These policies have contributed to a better sense of community in cities where public transportation is most vibrant, from optimized transit services to prioritizing spaces for pedestrians over private cars. Policies like Universal Basic Transportation have raised the bar for public

institutions, and more demands are being placed on them. Sometimes these demands lead to civic engagement and sometimes to frustration. People who choose to own private cars are paying much more than they used to, which hurts groups that need personal vehicles. Although initially, this felt like a loss, the high cost of owning a car in California has led to widespread co-ownership—some vehicles have up to 15 different owners!

Scenario 4 - Prioritizing Social Cohesion

What if public transit systems expanded their definition of riders beyond the commuter? What would it mean for you and your neighborhood? After years of falling short of their aspirations for diversity and inclusion, cities look explicitly for ways to address geographic segregation, inequality, and violence to achieve the

elusive state of vibrancy. Vibrancy is the truest measure of a city's health and wellbeing. By reimagining public transit as a purveyor of social cohesion, all riders—and therefore all neighborhoods—could now be on the map and collectively bring the city to life.

Figure 1.6 Scenario 4 Social Cohesion: Putting All Neighborhoods on the Map



Image Source: IFTF

This transit system that focuses on social cohesion benefits almost all San Francisco Bay Area residents, but it also diverts resources away from routes optimized for efficiency or revenue. Also, people who wish to keep their neighborhoods insular are largely opposed. In addition, the systems' focus on serving city residents means people who live outside the city and commute to San Francisco or have difficulty

proving residency because they are unhoused or for other reasons, would not share in the benefits. While a growing movement of concerned people has come forward with a list of reforms to rectify this and other issues, the small number of people who oppose the system overall use these issues as a wedge to cast doubt on the whole system.

Scenario 5 - Embedding Regeneration

Imagine repurposing transit agencies into climate action organizations. After decades of extreme weather and climate emergencies, deep social and economic inequalities, and intergenerational conflict over what to do about it all, political radicalization gives rise and voice to new generational power. With

this shift comes a vision that goes beyond climate mitigation to reach recovery, healing, rewilding, and regeneration. A new civic responsibility is emerging, and public transit agencies are at the center as mobility becomes a force for climate and community action.

Figure 1.7 Scenario 5 Embedded Regeneration Turning Transit Agencies into Climate Action Organizations



Image Source: IFTF

In this future, natural and rewilded environments will win the most, with benefits for society as well. Metrics to measure and assess the regenerative economy are yet to be standardized, while the long-term impacts of rewilding cities remain uncertain. However, riders and underprivileged communities gain quality of life as a result, while greener transportation providers benefit from a larger market. The last decade's authoritarianism, polarization, and mistrust still haunt the currently dominant generation, and their anger and anxiety over climate continue. However, there's a dramatic decrease in carbon-intensive employment and car ownership, and the aging Boomers, Gen-Xers, and

"net-zero" advocates have lost power. Climate activism is at an all-time high, but eco-authoritarianism is also rising. Knowing when and what to choose between top-down and bottom-up strategies and management is key in this future.

The future of transportation and public transit systems will likely contain elements and trends from each of these five scenarios. The Future Scenarios report aims to provoke stakeholder imagination and support their evaluation of scenarios of growth, constraint, collapse, and transformation. The scenarios will inform Phase III of the NTAS - specific marketing campaigns and messaging.

Map of the Future and Toolkit

The Map of the Future and Toolkit [Appendix 8] is an interactive tool that brings together the Future Forces and Future Scenarios. By considering a wide range of future possibilities—each with its own pathway toward transformation, set of implications, and trade-offs—transit agencies can prepare to face the future. Transit agencies are invited to tailor details of the future forces, impact zones, or scenarios to the unique characteristics of their agency, city, and public transit system, and to use this map and toolkit as a starting point for exploring future possibilities in their own location.

The Preparing to Face the Future report includes a toolkit for understanding these forces and presents scenarios of possible future transformations. It emphasizes the need for public transit agencies to adapt to changing patterns of mobility, technology advancements, and societal shifts to build resilient, useful, and equitable transportation systems. Agencies should utilize the provided toolkit to navigate these changes, anticipate future scenarios, and develop strategies to build resilient transit systems.

Overall, the report and toolkit serve as a comprehensive guide for public transportation agencies to navigate the challenges and opportunities of the coming decade, emphasizing engagement, imagination, and proactive planning.

The toolkit in the Face the Future report includes several components:

- **Future Forces:** This section uses a STEEP (Social, Technological, Environmental, Economic, and Political) analysis to identify the key forces driving change in public transportation over the next decade.
- **Forecasts and Signals:** Presents 15 shifts organized by future force, along with current developments indicating potential transformations in the public transportation sector.

- **Scenarios:** This part includes stories of possible transformations that could occur over the next decade, offering a glimpse into potential future states of public transportation.
- **Impact Zones:** The toolkit explores potential impacts across five key areas: Markets, Services, Decision-making, Risks, and Funding. These impact zones provide a framework for understanding how different aspects of public transportation might evolve and what areas might be most affected by changes.
- **Action Planning:** The toolkit encourages a systematic approach to considering each impact zone or focusing on specific concerns like expanding ridership. It suggests prioritizing these insights with stakeholders and mapping actions to achieve important goals, providing a framework for identifying and prioritizing concrete actions to take in the present. This approach is aimed at preparing for the future, even though it's not possible to predict it with certainty. to increase ridership in the post-pandemic context.
- **Understand how participants envision the future of mobility in the Bay area.**

Public Transportation providers can use this report systematically by considering each impact zone: markets, services, decision-making, risks, and funding. Or providers can focus on specific impact zones for specific critical concerns, such as expanding ridership. From there, transit agencies can prioritize these insights with their stakeholders and focus on a subset of impact zones that line up with a chosen goal—building ridership, addressing the climate crisis, etc.—and then map actions to reach that goal across a spectrum, from easy to difficult to accomplish or from high to low impact. This offers public transportation providers with a framework for identifying and prioritizing concrete actions to take in the present to put them on a path to their desired future.

Conclusion

U.S. public transportation is in a precarious position. Behavior and destinations have been deeply impacted by the COVID-19 pandemic, and while there have been pockets of resilience in some systems, that fails to ultimately solve the ridership issues that continue to challenge all public transit agencies.

Strategic foresight and futurizing practices increase transit agencies' ability to sense what is next, plan for it and begin the process of adaptation. It is with that in mind that this phase of NTAS was developed; to build trust and increase transit ridership through creating relevant services.

References

IFTF - Building a Future-Ready Public Transportation System

<https://www.iftf.org/projects/building-future-ready-public-transportation/>

Appendices

Appendix 1 - Interview and Outreach Participants

<https://www.sfmta.com/reports/appendix-1-ntas-interview-and-outreach-participants>

Appendix 2 - November 2021 Foresight Workshop Presentation

<https://www.sfmta.com/reports/appendix-2-ntas-november-2021-foresight-workshop-presentation>

Appendix 3 - Transit Rider / Non-Rider Interview Guide

<https://www.sfmta.com/reports/appendix-3-ntas-transit-rider-non-rider-interview-guide>

Appendix 4 - Transportation Expert Interview Guide

<https://www.sfmta.com/reports/appendix-4-ntas-transportation-expert-interview-guide>

Appendix 5 - Cross-Impact Matrix Presentation

<https://www.sfmta.com/reports/appendix-5-ntas-cross-impact-matrix-presentation>

Appendix 6 - Future Forces Shaping the Future of Public Transportation

<https://www.sfmta.com/reports/appendix-6-future-forces-shaping-future-public-transportation>

Appendix 7 - The Future of Transportation Five Scenarios

<https://www.sfmta.com/reports/appendix-7-future-transportation-five-scenarios>

Appendix 8 - Map And Toolkit

<https://www.sfmta.com/reports/appendix-8-map-and-toolkit-future>

