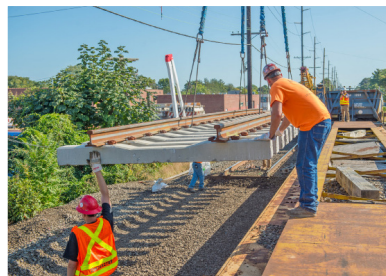




Moving Forward

Your Region, Connected



New York Metropolitan Transportation Council
Draft Regional Transportation Plan

Executive Summary

Introduction

The New York Metropolitan Transportation Council (NYMTC) has developed its next Regional Transportation Plan (RTP or Plan), ***Moving Forward, Your Region Connected***. The Plan covers all modes of surface transportation from a regional perspective including highways, streets, public transportation, bicycle and pedestrian facilities, goods movement, and special needs transportation. In addition, it addresses key transportation activities such as operations and management of the transportation system, safety, security, and regional finances.

About the Plan

The New York Metropolitan Transportation Council (NYMTC) developed *Moving Forward* its Federal Fiscal Years 2022-2050 regional transportation plan to cover all modes of surface transportation from a regional perspective including highways, streets, public transportation, bicycle and pedestrian facilities, goods movement, and special needs transportation. In addition, the Plan addresses key transportation activities such as operations and management of the transportation system, safety, security, and regional finances.

Moving Forward is a federally required planning product that lays out the region's long-term transportation needs and desires over a minimum 20-year time frame. Updated every four years, the Plan is a blueprint that helps support sustainable growth and guide federal funding for transportation investment in the region. This Plan updates the previous regional transportation plan, *Plan 2045*, and covers the 2022-2050 planning period.

As the MPO for New York City, Long Island, and the Lower Hudson Valley, NYMTC serves as a collaborative planning forum for the five boroughs of New York City; Nassau and Suffolk counties on Long Island; Putnam, Rockland, and Westchester counties in the Lower Hudson Valley; the State of New York; and the Metropolitan Transportation Authority to undertake the federally mandated planning process and access federal funding for transportation projects.

The Plan was developed collaboratively with NYMTC member agencies, other stakeholders, and members of public. *Moving Forward* is built around NYMTC's Shared Vision for Regional Mobility.

Public and Community Involvement in the Development of the Plan

NYMTC developed *Moving Forward* in part through a public involvement effort that engaged various constituencies and key audiences in its planning area. It gathered input from the public, community-based advocacy groups, communities of concern, and other stakeholders, including a Regional Transportation Plan Subcommittee composed of NYMTC planning area agency members. Engagement of communities traditionally underserved, including environmental justice (i.e., minority or low-income) and limited English proficiency populations, was emphasized broadly for outreach efforts associated with *Moving Forward*.

NYMTC initiated early outreach efforts for *Moving Forward* by conducting several in person workshops on shared mobility in September, November, and December 2019 and a region-wide workshop session

on micromobility in January 2020. In early 2020, NYMTC embarked on additional plan outreach elements when COVID-19 arrived in the United States. NYMTC had charted an outreach plan that included substantial in-person engagement through public workshops, focus groups, and pop-up outreach spanning New York City, Long Island, and the Lower Hudson Valley. When this region emerged as the early locus of the pandemic, and the prospect of conducting outreach with large groups of people face-to-face became untenable, NYMTC pivoted the *Moving Forward* engagement program to focus on remote and virtual forms of outreach with great care to ensure that diverse and representative input could be obtained. Public workshops were transformed into a series of highly successful interactive virtual workshops.

Equity Considerations in the Development of the Plan

Federal mandates have emphasized the importance of incorporating principles of non-discrimination and justice into all aspects of the transportation planning process. These mandates require that recipients of federal aid, including MPOs, comply with the policies set forth in Title VI of the Civil Rights Act of 1964 and Environmental Justice directives that address the disproportionately high and adverse human health or environmental effects on minority and low-income populations. *Moving Forward* includes an *Environmental Justice and Title VI Assessment* to ensure compliance with statutes regarding non-discrimination.

Environmental Mitigation Considerations in the Development of the Plan

Moving Forward includes an *Environmental Mitigation and New Consultation* section to ensure compliance with planning requirements for protecting and enhancing the region's natural resources, promoting energy conservation, improving the quality of life, and promoting consistency between transportation improvements and state and local planned growth. NYMTC formalized the consultation process for *Moving Forward* by directly reaching out to various partner agencies for input on environmental initiatives in the NYMTC region and participating in various public outreach activities. This outreach identified resource and conservation concerns that informed the development of the Plan.

Our Shared Vision for Regional Mobility

Our Region's Needs

Whether in Midtown Manhattan, Mount Vernon, Montebello, Mahopac, Mineola or Montauk, we all rely on the country's most robust transportation network to get us where we need to go and to make available the things that we need. Every day, millions of people are on the move in this multi-state metropolitan region—commuting to their jobs, dropping children off at school, visiting family and friends, racing to the airport to catch a flight, or just going about everyday routines. Every day, millions of tons of goods are on the move, being delivered at residences, moving to and from intermodal centers, distribution centers and warehouses, and traveling through the region to and from adjacent areas. And while different communities may move differently across our vast region, we all collectively share our need to get around easily and safely.

Our Vision

The members of the New York Metropolitan Transportation Council (NYMTC) recognize that mobility – the ability of people and goods to move easily and safely to, from and between locations – is crucial to the lives of everyone who resides in, works in, or visits the NYMTC planning region. Therefore, we aspire

to ensure that the mobility provided by our transportation systems reaches everyone in a sustainable, healthy, and equitable manner; to invest efficiently for these transportation needs; and to respond effectively to the transportation challenges of tomorrow.

As NYMTC, we will pursue our shared vision through the metropolitan transportation planning process built from this Plan. To do this, we envision a transportation system that:



1 Ensures the safety and security of people and goods across all uses and modes.



2 Is maintained, operated, and coordinated to better enable equitable, reliable, easy, accessible, and seamless travel across the region.



3 Efficiently serves today's population and plans for the growing number of residents, workers, and increasing amount of goods.



4 Minimizes its greenhouse gas emissions and other impacts on the environment, especially the effects of climate change.



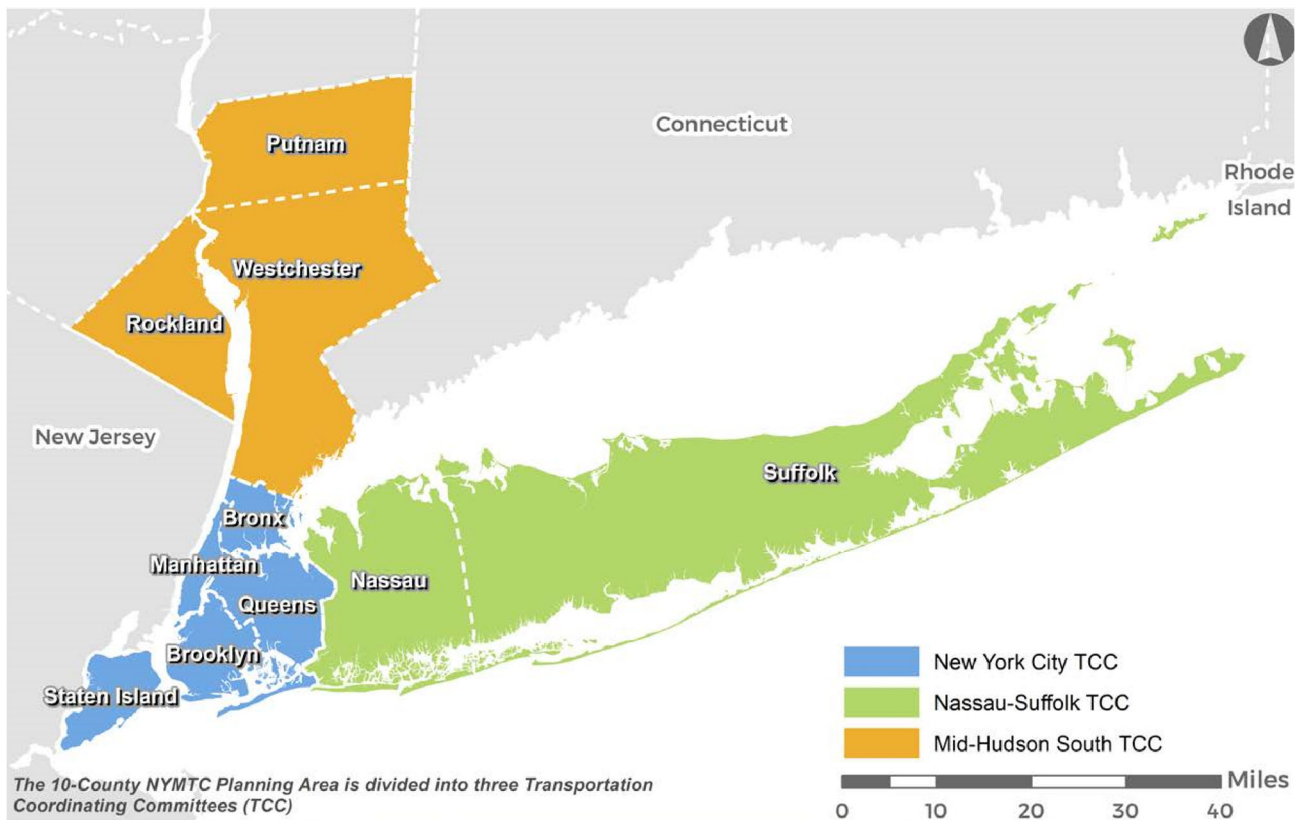
5 Is resilient and can mitigate, adapt to, and respond to chronic and acute stresses and disruptions.

Who Are We?

Federal legislation requires that any urbanized area with a population greater than 50,000 must have a metropolitan planning organization (MPO) to plan for and make decisions on the use of federal transportation funding. MPOs ensure that existing and future expenditures for transportation projects and programs are based on a continuing, cooperative, and comprehensive planning process. Among other functions/requirements, MPOs cooperate with state and public transportation operators to program federal funds for eligible transportation projects.

As the MPO for New York City, Long Island, and the Lower Hudson Valley, NYMTC serves as a collaborative planning forum for the five boroughs of New York City; Nassau and Suffolk counties on Long Island; and Putnam, Rockland and Westchester counties in the Lower Hudson Valley; the State of New York; and the Metropolitan Transportation Authority to undertake the federally mandated planning process and access federal funding for transportation projects. NYMTC’s regional council is advised by the Port Authority of New York and New Jersey, New Jersey Transit, and the North Jersey Transportation Planning Authority, as well New York State’s Department of Environmental Conservation, the U.S. Environmental Protection Agency, and two modal administrations of the U.S. Department of Transportation: the Federal Highway Administration (FHWA) and the Federal Transit Administration.

As NYMTC, our planning efforts help ensure that the region is prepared to obtain the maximum federal funds available to achieve the shared regional goals of our member agencies for the future of the



transportation system. As NYMTC, we are a forum for collaborative planning from a regional perspective. We facilitate informed decision-making among our members by providing sound technical analysis and forecasts to focus the collective planning activities of NYMTC’s members to achieve a shared regional vision.

Our Guiding Principles

As we pursue these goals through our regional transportation planning process, the following guiding principles inform our planning:

- We will consider the needs of all users in NYMTC’s planning area throughout the planning process.
- We will make the best use of federal resources for the regional transportation system and increase them where practical, while leveraging local resources as efficiently and effectively as possible.
- We will monitor the performance of the regional transportation system as a means of prioritizing improvements and investments.
- We will support multi-agency approaches that enhance the integration of independently operated components of the regional transportation system.
- We will engage the public and community stakeholders. and
- We will harness technological advancements to improve our transportation system.

Our Objectives in Pursuing These Goals

Safety & Security

Goal: A transportation system that ensures the safety and security of people and goods across all uses and modes.

Objectives:

1. Ensure that investments in existing physical assets protect the safety of, among others, passengers and freight systems.
2. Promote safe streets and intersections.
3. Keep the transportation system secure from threats.
4. Coordinate safety management, training and education across jurisdictional borders.
5. Improve the safety and security of system operations.

Reliable & Easy Travel

Goal: A transportation system that is maintained, operated, and coordinated to better enable equitable reliable, easy, accessible and seamless travel across the region

Objectives:

1. Rebuild/replace and modernize the assets that comprise the region's vast transportation infrastructure.
2. Improve first- and last-mile access to transit.
3. Provide more frequent and reliable transit service.
4. Improve accessibility to the transportation system for users of all abilities.
5. Invest in improving the integration of the multimodal transit network.
6. Improve the integration of freight modes and facilities.
7. Invest in collection and sharing of quality transportation data.
8. Promote equitable transportation and workplace access opportunities for all populations regardless of age, ability, race, ethnicity, or income.

Invest in collection and sharing of quality transportation data.

Planning for Changing Demand

Goal: A transportation system that efficiently serves today's population and plans for the growing number of residents, workers, and increasing amounts of goods.

Objectives:

1. Invest in system capacity to satisfy demand and relieve overcrowding, with an emphasis on core markets and activity centers.
2. Expand the reach of the system to underserved communities and emerging markets, addressing passenger transportation as well as access to goods and freight services.
3. Encourage walking and biking, transit-oriented development, Complete Streets, parking and curb management, and other long-term sustainable land use strategies that support passenger and goods movement.
4. Modernize local freight networks to efficiently plan for growth in volume of and change in product deliveries.
5. Incorporate emerging and innovative transportation services and tools into efficient network design.

Reducing Environmental Impact

Goal: A transportation system that minimizes its impact of the environment, especially the effects of climate change

Objectives:

1. Encourage alternatives to single-occupant vehicle trips.
2. Encourage alternatives to trucking freight.
3. Modernize fleets to higher-standard and lower-emissions vehicles.
4. Efficiently manage limited roadway capacity to mitigate congestion and vehicular emissions.
5. Promote responsible environmental stewardship in transportation projects.

6. Address unequal impacts of transportation emissions on communities.

Resiliency

Goal: A transportation system that is resilient and can mitigate, adapt to, and respond to chronic and acute stresses and disruptions.

Objectives:

1. Protect and fortify major transportation assets.
2. Continue to invest in sea level rise and climate change risk analyses for transportation assets.
3. . Improve regional coordination on emergency and long-term responses to systemwide climate impacts.
4. Enhance the transportation network’s resiliency by increasing travel options and redundancies.

Our Expectations for the Future

The multi-state metropolitan region of which the NYMTC planning area is part has one of the oldest, most complex, and highly used transportation networks in the world. On a typical weekday in 2019, the region’s multimodal transportation network handled more than five million passenger trips and thousands of tons of freight shipments. Notably, public transit mode share on this network is the highest in the United States, accounting for nearly 40 percent of all transit trips taken in the country, which is a testament to the scale of the public transit components of the network.

The transportation system includes both the federally supported transportation system and the facilities of five self-financed public authorities with jurisdiction over significant system components that are not considered part of the federally supported system, namely: the Port Authority of New York and New Jersey, the New York State Thruway Authority, the New York State Bridge Authority, MTA Bridges and Tunnels (legally, the Triborough Bridge and Tunnel Authority), and the Nassau County Bridge Authority.

Continued Growth

Understanding socioeconomic trends is an essential step to forecasting travel demand or use of the regional transportation system. NYMTC’s socioeconomic and demographic forecasts establish the likelihood that the multi-state metropolitan region will experience significant growth in population, jobs, economic activity, and travel over the planning period. This likelihood presents a challenge to the regional transportation system and highlights the importance of accommodating future growth while safeguarding the quality of life and health of residents and visitors.

At this writing, the COVID-19 pandemic, whose impacts in the forecasting region were first felt in March 2020, has significantly disrupted growth trends. While adjustments have been made to the forecasts to reflect this short-term impact and resulting economic uncertainty, the ongoing conditions and effects of the pandemic are largely speculative. Nonetheless, the primary purpose of the forecast is the long-term outlook, which is less susceptible to short-term volatility. As new data become available regarding the impacts of the pandemic on regional employment and population trends, they will be incorporated in the next set of socioeconomic forecasts.

Socioeconomic and Demographic Forecasts for the NYMTC Planning Area

	2017	2050	Percent Change 2017 to 2050
Population	12.82 million	14.13 million	10.23%
Employment	7.08 million	8.07 million	13.95%
Civilian Labor Force	6.50 million	7.22 million	10.99%
Average Household Size	2.75	2.71	-1.38%

Among the NYMTC subregions, Long Island is expected to have the highest rate of growth in population and civilian labor force, increasing by 11.7 percent and 12 percent, respectively. New York City is forecast to experience the highest rate of job growth and add the highest total numbers for all indicators except average household size, adding more than 850,000 to its population, more than 770,000 jobs, and 300,000 more people to the civilian labor force. Average household size is expected to decrease for all three subregions and will shrink by 1.38 percent across the NYMTC planning area from 2.75 to 2.71 household members.

Moving People

Growth in travel is expected to occur in the NYMTC planning area and its subregions across all modes. Total daily trips are forecast to reach approximately 31 million by 2045, an increase of 9 percent. Daily auto trips are expected to grow by 11 percent, while daily transit trips are forecast to grow by 8 percent. Growth in daily vehicle miles of travel (VMT) and vehicle hours of travel (VHT) are expected to continue, as more trips taken on the transportation system add to vehicle use and congestion.

Moving Goods

Meanwhile, more than 300 million tons of domestic freight worth more than \$430 billion moves into, out of, and within the NYMTC planning area by truck, rail, water, air, and pipeline annually; around 18 million tons of international freight worth \$211 billion is imported to and exported from the NYMTC planning area annually. Trucks are responsible for moving more than 92 percent of domestic tonnage and nearly 88 percent of domestic value. Around 61 percent of tonnage and 65 percent of value is moving inbound to the NYMTC planning area; around 19 percent of tonnage and 18 percent of value is moving outbound; and the remainder is moving between or within NYMTC counties. The NYMTC planning area is expected to gain another 127 million tons of domestic freight worth nearly \$300 billion by 2045 and experience substantial growth in international freight.

Transformational Changes

During the planning period, it is likely that technological, behavioral, economic, and environmental changes, the beginnings of which are evident today, will affect the region's overall mobility. Some of these changes will be the result of, or be accelerated by, the COVID-19 pandemic. Others have been underway and will carry forward once the pandemic is over. These trends have the potential to transform the nature and means of travel for people and goods in the multi-state metropolitan region.

Consequently, the development of the Plan considered the potential effects on transportation of numerous transformational changes, including shared mobility, mobility-as-a-service, e-commerce, distributed manufacturing, climate change and extreme weather events, energy transformation, changing demographics and lifestyle/workstyle expectations, and changing land use patterns.

Transformational changes and the future of mobility will influence *Moving Forward's* strategic framework. Some possible outcomes will likely influence how NYMTC as an organization and its members individually seek to fulfill the goals of their Shared Vision for Regional Mobility. Other potential outcomes, such as evolving forms of shared mobility, will affect the way these goals are pursued. *Moving Forward* attempts to lay the groundwork for anticipating these developments and formulating approaches. However, greater attention will be needed going forward to better understand current trends, potential futures, and possible outcomes.

Our Recommendations

Given future expectations, *Moving Forward* recommends short- and medium-term strategies and actions within the context of the Shared Vision for Regional Mobility. Specifically, the Plan assesses recent trends, current conditions, and existing initiatives for each Vision Goal and corresponding objectives, as a basis for recommended approaches and actions. These recommendations were then developed using the framework provided by the Vision Goals and objectives, as well as the guiding principles that are part of the Shared Vision.

Short- and Medium-Term Strategies and Action

Following are several categories of short- and medium-range strategies and actions recommended in pursuit of these Vision Goals.

Safety and Security.

Planning and Research Initiatives

- Research recommendations:
 - Assess safety and security needs in the suburban subareas modelled after the process used in New York City.
 - Inventory current and developing technology that can be used to improve safety and security.
 - Identify potential funding sources for system security and safety and security training.
 - Conduct a gap analysis on monitoring and surveillance to deter threats and identify coordination needs for transportation system security.
- Support the creation of contingency plans for disruptive events or in anticipation of major roadway or transit closures.

Data Collection, Forecasting, and Performance Assessment

- Develop a comprehensive data collection and reporting system for safety and security in the planning area.

Planning Process Recommendations

- Expand the Safety Advisory Working Group to include security-related agencies and organizations.

- Coordinate joint security exercises between transit agencies and neighboring jurisdictions via the Metropolitan Area Planning (MAP) Forum.
- Encourage common crosswalk standards among NYMTC's members responsible for roadway operations.
- Encourage consideration of roundabouts among NYMTC's members responsible for roadway operations.

Program Recommendations

- Regional guidance programs:
 - Develop a common safe streets/intersections guidebook for all jurisdictions in the planning area.
 - Coordinate customer alert systems to notify of relevant events in a timely manner.
 - Coordinate and enhance equitable safety-related traffic programs in the vicinity of schools.
- Education and training programs
 - Expand safety education programs and public awareness campaigns.
 - Coordinate and enhance safety education and programs in the suburban subregions.
 - Execute training for multi-agency safety and security coordination and/or develop a common guidebook.
 - Expand safety and security training programs for local municipalities and communities.

Reliable and Easy Travel.

Planning and Research Initiatives

- Research recommendations:
 - Inventory current and developing technology that can be used to improve transit access and transit asset durability and monitor asset condition.
 - Assess transit services throughout the planning area to identify opportunities for increased service frequency and/or reliability.
 - Assess transit service coordination needs across jurisdictional lines and evaluate intermodal connections.
 - Inventory freight facilities and services throughout the planning area and integrate the results of the freight-related land use inventory.
 - Inventory potential funding sources for transit operations and improved transit accessibility.
 - Identify potential funding sources for integration of freight modes.
- Develop a transit access plan for the entire planning area and perform a benchmarking exercise of transit systems across the country for transit access, service frequency, and service reliability.
- Develop a comprehensive freight integration strategy.

Data Collection, Forecasting, and Performance Assessment

- Publish an annual report on accessible pedestrian signals.
- Survey pedestrian ramps to enhance maintenance programs and continue to provide for safe and accessible corners that are ADA compliant.
- Perform a passenger data needs and sources assessment of member agencies to establish a well-coordinated system.
 - Include relevant sources of "big data" and technological tools for data collection.

- Identify data sources for key system interfaces.
- Develop the Regional Freight Data Program.

Planning Process Recommendations

- Aggressively propose relevant projects for federal discretionary programs and related state-level programs.
- Identify priority multi-agency system preservation projects.
- Identify priority multimodal corridors throughout the planning area and optimize project selection for these corridors.
- Convene interagency work groups through the Transportation Coordinating Committees (TCCs) to address priority multimodal corridors.

Program Recommendations

- Regional guidance programs:
 - Coordinate suburban municipalities and appropriate jurisdictions to improve access to transit stops/stations.
 - Develop a common transit accessibility guidebook based on universal design standards and existing policies of the members agencies.
 - Fully integrate transit mapping/trip planning resources and enhance integration of suburban services into regional public information portals.
- Transit access programs:
 - Increase transit access through micromobility and shared mobility.
 - Enhance fare and service integration between suburban transit providers and MTA services.
 - Expand the availability of real time information at transit stations and stops.
 - Improve public communication on transit service status and service changes.
 - Improve transit facility accessibility for all regardless of disability status.
- Transit service enhancement programs:
 - Reduce commute times and improve transit speeds in low- and moderate-income communities underserved by transit.
 - Expand the availability of shared-use mobility services, including bike share, carshare, and rideshare that support safe, affordable, and sustainable travel choices.
- Freight access program:
 - Improve truck access to industrial areas, marine terminals, and airports.

Planning for Changing Demand

Planning and Research Initiatives

- Research recommendations:
 - Identify core markets, emerging markets, activity centers, and underserved communities using the Coordinated Development Emphasis Areas (CDEAs), socioeconomic and demographic forecasts, and Title VI/Environmental Justice assessment to develop multimodal plans for the identified areas.
 - Identify the most efficient ways to serve emerging markets and underserved communities, particularly those in areas of low-density development where fixed-route bus service may not be effective.

- Benchmark techniques to address fare issues for lower income riders and seniors across all transit services.
- Assess the distribution of bicycle lanes, bicycle facilities, and bike sharing opportunities throughout the NYMTC planning area in terms of equity.
- Assess late night/overnight travel needs.
- Continue to address congested links and bottlenecks identified by the congestion management process (CMP) through multimodal planning studies.
- Develop or update transit service plans for each suburban system in the planning area given forecasts of future demand.
- Develop a comprehensive freight strategy for the multi-state metropolitan region.

Planning Process Recommendations

- Encourage sharing of data to better manage truck movements throughout the region.
- Use the CDEAs as a targeting mechanism for a continuing program of community planning activities that:
 - Encourage development in centers and downtowns to reinforce walkable, aesthetically pleasing, and transit-accessible environments.
 - Encourage consideration of local transportation issues in comprehensive/master planning and community visioning processes.
 - Make walking safer and more convenient through safety and streetscape improvements.
 - Support downtown development/redevelopment.
 - Encourage walkability, Complete Streets, and remote parking in targeted centers.
 - Complete and distribute MTA First Mile/Last Mile Station Access Toolkit.
- Convene interagency work groups through the TCCs to identify and address priority multimodal corridors; including exploring technological options.
- Convene the designated recipients of federal transit funding to explore the costs and benefits of joint procurement for transit equipment.
- Bring together relevant agencies and private sector interests through the Multi-State Freight Working Group to address identified opportunities for freight network modernization.

Program Recommendations

- Complete Streets programs:
 - Apply Complete Streets design principles that accommodate all users of the transportation network.
 - Improve the bus network by installing bus priority treatments such as bus lanes, traffic signal prioritization, and camera enforcement.
 - Expand the bicycle lane network and improve bike access to bridges.
 - Strive to make sidewalks, pedestrian spaces, and transit stops and stations accessible.
- Transit access programs:
 - Integrate the OMNY fare system with suburban bus systems and ferry services throughout the NYMTC planning area.
 - Expand transit fare media purchase locations.
- Shared Mobility program:

- Expand the availability of shared-use mobility services, including bike share, carshare, and rideshare that support safe, affordable, and sustainable travel choices.

Reducing Environmental Impact

Planning and Research Initiatives

- Research recommendations:
 - Investigate opportunities for better integrating shared mobility and micromobility in the transportation system.
 - Research technological options for greater freight integration.
 - Explore technologies related to environmental stewardship.
 - Consider incentives for alternative fuel vehicles/electric vehicle ownership.
- Engage in multimodal planning studies to address congested links identified through the CMP.
- Use the results of the inventory of freight-related land uses to identify opportunities for rail freight and intermodal capacity expansion.

Data Collection, Forecasting, and Performance Assessment

- Monitor congested link-level performance.
- Monitor truck traffic and commodity flows.
- Report on greenhouse gas forecasts with each Transportation Conformity Determination.

Planning Process Recommendations

- Continue convening relevant agencies and private sector interests through the Multi-State Freight Working Group to improve the efficiency of freight delivery.
- Develop multi-agency approaches for benchmarking and sharing vehicle specification information for public fleet procurement.
- Encourage suburban municipalities to adopt Complete Streets policies to accommodate transit, walking, and biking to reduce vehicle congestion and associated emissions.
- Develop and adopt environmental stewardship guidelines for project selection.
 - Employ bioswales where practical in watershed areas.

Program Recommendations

- Community planning program:
 - Include alternatives to single occupant vehicle (SOV) trips in the program of community planning activities.
- Commuting alternatives program:
 - Enhance and coordinate employer commuting programs throughout the NYMTC planning area.
 - Enhance outreach to major employers, the business community, hospitals, colleges, and other institutions to encourage alternatives to SOV travel.
 - Continue and enhance model programs for use at developments such as office parks, medical facilities, and college campuses that include emerging and innovative transportation services such as shared mobility and micromobility.

- Public messaging and marketing programs:
 - Undertake initiatives that encourage use of public transit; encourage seniors to sign up for reduced fare transit services.
 - Enhance the public visibility of the 511NY service and its various components.
- Vehicular emissions program to reduce emissions from publicly and privately owned vehicle fleets:
 - Purchase either hybrid or all-electric vehicles and ferries that run with cleaner engines in transit life-cycle replacement programs.
 - Continue and expand a program of information sharing for local municipal vehicle fleets, through existing Clean Cities programs where feasible.
 - Support accelerated retirement of pre-Tier 4 diesel engines in the legacy fleet and replace with cleaner alternatives such as trucks running on renewable diesel or alternative fuels such as compressed natural gas and EV.
 - Increase access and availability of electric vehicle charging stations and other alternative fuels to support clean freight goals.
 - Encourage the use of cargo bicycles for commercial purposes.
- Innovative materials program:
 - Test permeable pavement and concrete; install green infrastructure on streets.
 - Share information on tests of permeable surfaces among NYMTC's members responsible for roadways.

Resiliency

Planning and Research Initiatives

- Research recommendations:
 - Inventory all areas included in the U.S. Department of Housing and Urban Development Rebuild by Design Program and the New York Rising Community Reconstruction Program and related community imperatives and transportation-related proposals.
 - Inventory specific technologies related to system protection and fortification.
 - Inventory/benchmark resiliency and adaptation practices for all sectors.
 - Inventory relevant funding programs at all levels to include programs, sources, and private sector options relevant to system protection and fortification.
 - Identify resources and funding sources for continuing risk analyses.
- Support the development of detailed transportation contingency plans.
- Revisit the FHWA risk analysis and monitor risk on an on-going basis as part of the enhanced planning process.

Data Collection, Forecasting, and Performance Assessment

- Identify and monitor vulnerable transportation assets throughout the planning area using the most recent available climate and sea level rise forecasts.
- Develop an annual report of regional coordination.

Planning Process Recommendations

- Coordinate transit agencies and jurisdictions in developing procedures and plans to respond to emergency events.
- Support multi-agency planning and design efforts for coastal protection systems.

- Develop an enhanced resiliency planning process through the MAP Forum and the National Institute of Standards and Technology Smart Regions Collaborative.
 - Explore improved travel options and redundancies through the newly established working group.
 - Promote modal redundancy.
 - Use information from the CMP and socioeconomic and demographic forecasts to inform the working group’s exploration of travel options and redundancies.
 - Explore specific technologies related to travel options and redundancies.
- Share risk analysis results with local municipalities throughout the planning area.
- Establish a working group of NYMTC’s member agencies to review and enhance emergency and long-term responses to climate impacts.
- Enhance project funding mechanisms for system protection and fortification through project selection by the TCCs.
- Enhance project funding mechanisms for travel options and redundancies through project selection by the TCCs that is based on the working group’s exploration.

Program Recommendations

- Complete a broad range of resiliency projects, including retrofits to bridges, streets, traffic signals, yards, and facilities.

Recommended Projects, Programs, and Studies

Moving Forward recommends numerous projects, programs, and studies to improve the movement of people and goods during the planning period. These recommended improvements and actions fall into two distinct categories: programmed projects that are in the Plan’s fiscally constrained element and aspirational projects, proposals, and studies that are in the Plan’s vision element. Programmed projects in the fiscally constrained element are sufficiently developed that estimated costs are defined. The aspirational vision projects are those projects, programs, and studies that are relatively undefined and in almost all cases do not have an identified source of funding. Vision projects are often moved into the constrained Plan when they are sufficiently defined. *Appendix A* presents a master listing of these recommended items.

Opportunities for Coordination and Investment in the Pedestrian and Bicycle Transportation System

The **Shared Vision** is supported by strategies to further enhance the pedestrian and bicycle transportation system of the NYMTC planning area communities. Background information such as demographics, travel data, existing facilities, and plans for pedestrians and bicyclists underlying the strategies is presented along with an inventory of existing on-road and off-road bicycle facilities in **Appendix B: Pedestrian and Bicycle Plan Element**.

Opportunities for Coordination and Investment in Goods Movement

The needs and issues identified in the Regional Freight Plan 2018–2045 addressed both urban and non-urban areas of the NYMTC planning area; they are carried forward as part of the *Moving Forward* Freight Element. The Regional Freight Plan identifies freight-related needs, issues, and recommendations relevant to the **Shared Vision** and freight-specific action items for inclusion in the larger set of projects, programs, and studies recommended by *Moving Forward* and comprising **Appendix H: Regional Freight Element**.

Opportunities for Coordination and Investment in Specialized Transportation Services

The NYMTC planning area features a diverse landscape of transportation services that includes several levels of public transit, paratransit, and human service transportation options. These services and the variety of service providers in this geographically and demographically diverse area make coordinating the needs and services for older adults and people with disabilities challenging. Opportunities for coordination and investment in specialized transportation services are an important component of the Plan's recommendations. *Appendix F* presents a listing of these opportunities comprising the **Coordinated Public Transit - Human Services Transportation Plan**.

Our Plan to Pay for Our Plan

Moving Forward estimates that approximately \$906 billion in year of expenditure (YOE) dollars (an average of \$31 billion per year) will likely be needed through the Plan's 2050 horizon year to adequately operate and maintain system components and services. Roughly 95 percent of the NYMTC planning area's forecasted operations and maintenance costs are related to the operation of transit services.

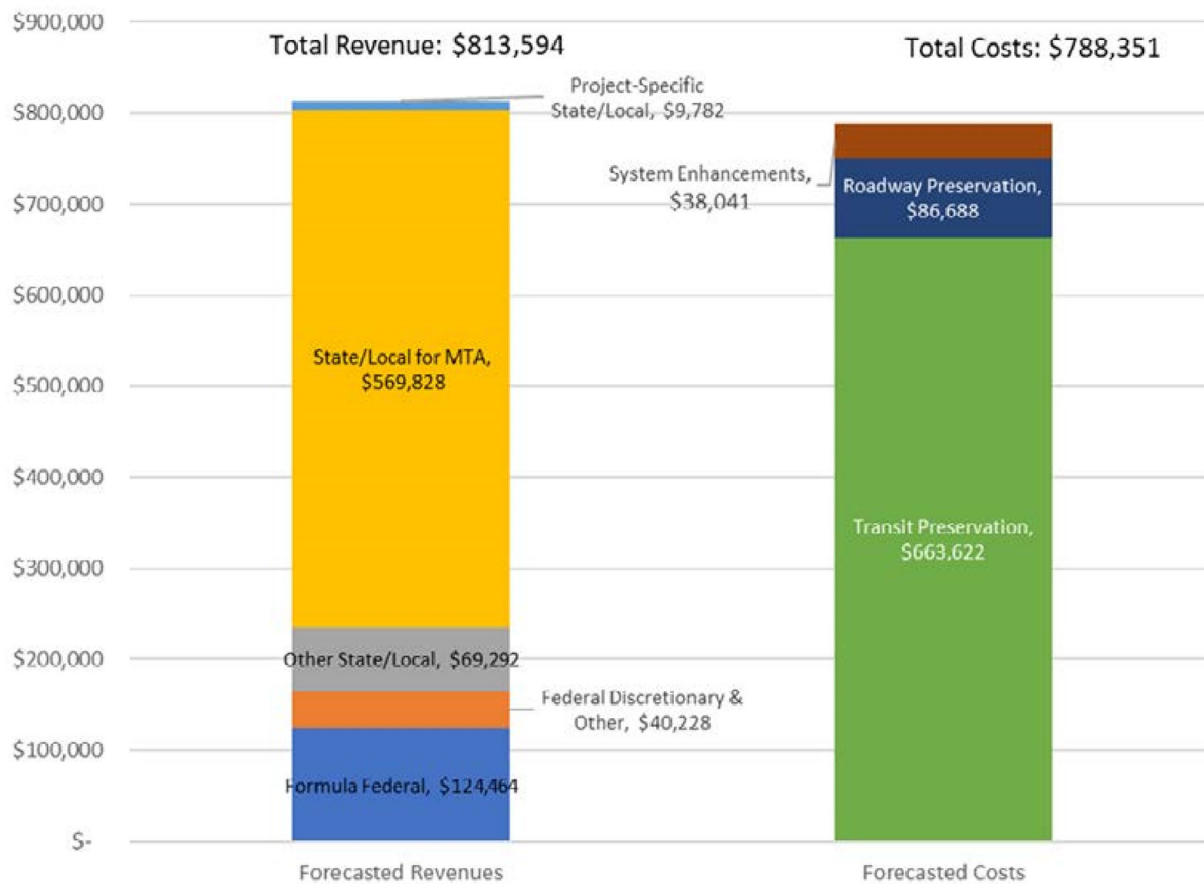
Meanwhile, approximately \$750 billion in YOE dollars (\$26 billion annual average) in system preservation projects and strategies will be needed to maintain all aspects of the transportation system. Systems preservation is broadly defined as costs related to the life-cycle replacement, refurbishment, rehabilitation, reconditioning, or reconstruction of components of the federally supported transportation system.

Finally, *Moving Forward* recommends system enhancement projects and strategies that total \$38 billion in YOE dollars. System enhancement refers to extensions and/or improvements to the existing transportation system or new segments or services added to the transportation system to improve capacity and/or throughput.

Funding the Plan

In total, the projects and programs proposed for funding in *Moving Forward* are forecast to cost \$788 billion in YOE dollars (\$27 billion annual average) to preserve and enhance the federally supported transportation system through the planning period. The Plan estimates that \$814 billion from all sources – federal, state, local and private -- are reasonably expected to be available during the planning period, an annual average of \$28 billion.

Revenues vs. Costs - Federally Supported Transportation System (in millions of YOE dollars)



Moving Forward assumes that the strong federal partnership that has characterized transportation funding in the NYMTC planning area will continue during the planning period and play a significant role in the preservation and enhancement of the federally supported transportation system. These resources will be leveraged with New York State-authorized revenues, and local revenues are assumed to be available, as necessary, to complement federal and state funding. NYMTC’s members have a longstanding and demonstrated history of providing the non-federal share necessary to leverage any additional funds that are apportioned/allocated to the region.

Moving Forward identifies a number of project-specific federal, state, and local funding sources among its estimates of available funding.

The availability, adoption, and implementation of these additional funding opportunities are subject to legislative actions at various levels of government, as well as budgeting and policy decisions. As an organization, NYMTC does not have the statutory authority to adopt or implement these additional funding opportunities as they fall outside the metropolitan transportation planning process.

Managing System Performance

Under federal metropolitan planning regulations, NYMTC must apply a transportation performance management approach in carrying out its federally required transportation planning and programming activities. The process requires the establishment and use of a coordinated, performance-based approach to transportation planning and programming in support of national goals for federal-aid highway and public transportation programs.

Major Parameters of the Federally Supported Transportation System

Over 19,000 lane-miles of interstates, freeways, parkways, expressways, arterial and collector roadways.
Over 2,400 roadway bridges of all types under the ownership of the state, counties and local municipalities.
Nearly 480 route miles of commuter rail and 225 route miles of subway tracks in passenger service, plus hundreds of miles of local, express, commuter, and intercity bus routes and an aerial tramway.
An extensive network of passenger hubs, transit stations and stops, bus terminals and subway transfer facilities, ferry landings, and bus stops.
More than 1,300 miles of bicycle facilities, ranging from shared-use bike trails to on road bike lanes, in addition to pedestrian sidewalks, trails, and paths.
Supporting infrastructure such as rail yards and highway maintenance facilities, highway rest areas, parking lots and garages, bus depots and transit storage yards, bicycle parking areas, toll plazas, signage, signals, electronics, and other equipment.

A *System Performance Report* is an element of *Moving Forward* that evaluates the condition and performance of the transportation system, sets performance targets, and reports on current progress in meeting the targets. These items are addressed for the following required measures:

- Highway Safety Performance
- Pavement and Bridge Condition Performance
- System Performance, Freight, and Congestion Mitigation and Air Quality Improvement Program Performance
- Transit Asset Performance
- Transit Safety Performance

Additionally, specific performance metrics also correspond to each of the [Vision Goals](#).

Plan Documents

Moving Forward is organized into chapters and appendices that convey the results of discussions and analyses during the Plan’s development.

Chapters

Chapter 1: NYMTC’s Shared Vision for Regional Mobility. The elected and appointed officials who make up NYMTC recognize that mobility—the ability of people and goods to move easily and safely to, from, and between locations—is crucial to the lives of everyone who lives, works, or visits the NYMTC planning area. Therefore, we aspire to (1) ensure that the mobility provided reaches everyone in a sustainable, healthy, and equitable manner; (2) invest efficiently for these transportation needs; and (3) respond effectively to the transportation challenges of tomorrow. The Vision and Goals, Guiding Principles, and Objectives described in this chapter were employed throughout the *Moving Forward* planning process.

Chapter 2: How Transportation Planning Happens. Federal legislation and related planning regulations require MPOs to produce a long-range regional transportation plan, a five-year transportation improvement program, and an annual unified planning work program. *Moving Forward* is the regional transportation plan for fiscal years 2022–2050 for the NYMTC planning area. *Moving Forward* includes forecasts of future conditions and needs and potential transportation improvements, as well as a shared strategic vision for transportation and development within the NYMTC planning area. NYMTC’s **Shared Vision** for Regional Mobility, which guides *Moving Forward*, is built from a framework of its members and advisers’ strategic goals; associated objectives; and related projects, programs, and studies.

Chapter 3: A Context for Our Planning – System Performance and Future Needs. The System Performance Report is an element of *Moving Forward* that evaluates the condition and performance of the transportation system, sets performance targets, and reports on current progress in meeting the targets. In addition, the Systems Performance Report included in this chapter addresses: highway safety, bridge and pavement, system performance, transit asset management, and transit safety performance assessments and targets.

Chapter 4: What We Plan to Do – Plans, Programs, and Projects. This chapter describes the five Vision Goals and their objectives in detail. Relevant trends and conditions are analyzed for each goal, and related existing programmatic initiatives are described. Additionally, short- and medium-term strategies and actions for each goal and its objectives are recommended.

Chapter 5: The Plan to Pay for the Plan. *Moving Forward* encompasses activities related to the federally supported transportation system, including operations and maintenance of the system; the life-cycle

replacement, refurbishment, rehabilitation, reconditioning, or reconstruction of components of the system; and extensions and/or improvements to the existing transportation system or new segments or services added to the transportation system to improve capacity and/or throughput. *Moving Forward's* financial chapter describes the estimated costs for these activities and anticipated sources of revenues to cover the costs.

Appendices

Appendix A: Recommended Projects, Programs, and Studies. *Moving Forward* recommends numerous projects, programs, and studies for the NYMTC planning area during the 2021–2050 planning period. These recommended improvements and actions fall into two distinct categories: programmed projects that are in the Plan's fiscally constrained element and aspirational projects, proposals, and studies that are in the Plan's vision element. Programmed projects in the fiscally constrained element are sufficiently developed that likely costs and potential funding are defined. The aspirational vision projects are those projects, programs, and studies that are relatively undefined and in almost all cases do not have an identified source of funding. Vision projects are often moved into the constrained Plan when they are sufficiently defined.

Appendix B: Pedestrian and Bicycle Element. Walking and bicycling are integral parts of life in the NYMTC planning area, providing residents with the means for commuting and traveling for recreational purposes. This Pedestrian-Bicycle Element outlines several strategies that support the **Shared Vision** goals and further enhances the pedestrian and bicycle transportation system.

Appendix C: Socioeconomic and Demographic (SED) Forecasts. The focus of this appendix is to present data and information on a wide range of recent socioeconomic and demographic trends and forecasts over the course of the Plan. SED forecasts have been developed for a 31-county "forecast region" in the multi-state metropolitan region. Forecasts are provided for the following categories: employment, population, labor force, households, and household size. The forecasts, which are disaggregated geographically into discrete traffic analysis zones, are fundamental inputs to forecasting travel demand within the transportation system.

Appendix D: Environmental Justice and Title VI Assessment. Every day, millions of people from diverse communities are moving throughout the NYMTC planning area. One of the guiding principles of NYMTC is to consider the needs of all users across its planning area in the planning process. Federal mandates emphasize the importance of addressing the disproportionately high and adverse human health or environmental effects on minority and low-income populations through all aspects of the transportation planning process and require that recipients of federal aid comply with the policies set forth in Title VI of the Civil Rights Act and Environmental Justice directives. The Environmental Justice and Title VI Assessment ensures compliance with the requirements regarding non-discrimination and justice within the transportation planning and programming process for *Moving Forward*.

Appendix E: Environmental Mitigation and New Consultation. NYMTC is committed to protecting and enhancing the region's natural resources, promoting energy conservation, improving the quality of life, and promoting consistency between transportation improvements and state and local planned growth. Specific to the development of *Moving Forward*, environmental stewardship and mitigation support the Plan's **Shared Vision** and Goals, particularly the Plan's goal of reducing environmental impacts. NYMTC

formalized the consultation process for *Moving Forward* by directly reaching out to various partner agencies for input on environmental initiatives in the NYMTC region and participation in the various public outreach activities. This outreach identified resource and conservation concerns that informed the development of the Plan.

Appendix F: Coordinated Public Transit – Human Services Transportation Plan. The NYMTC planning area features a large, diverse, multimodal transportation landscape that includes several levels of public transit, paratransit, and human service transportation options. These multiple levels of transportation services and the large number of providers in this geographically and demographically diverse area make coordinating the needs and services for specific groups in the resident population challenging. The Coordinated Plan reflects changes in the federal funding program and identifies opportunities for coordination and investment in specialized transportation services throughout the NYMTC planning area by comparing the various transportation services available in each of the counties and boroughs to the needs of the two target populations: older adults (age 65 and older) and people with disabilities.

Appendix G: Public Involvement Report. NYMTC developed *Moving Forward* in part through a public involvement effort that engaged various constituencies and key audiences in its planning area. It gathered input from the public, community-based advocacy groups, communities of concern, and other stakeholders, including a Regional Transportation Plan Subcommittee composed of NYMTC planning area agency members. Engagement of communities traditionally underserved, including environmental justice (i.e., minority or low-income) and limited English proficiency populations, was emphasized broadly for outreach efforts associated with *Moving Forward*. NYMTC initiated early outreach efforts for *Moving Forward* by conducting several in person workshops on shared mobility in September, November, and December 2019 and a region-wide workshop session on micromobility in January 2020. In early 2020, NYMTC embarked on additional plan outreach elements when the novel coronavirus (COVID-19) arrived in the United States. NYMTC had charted an outreach plan that included substantial in-person engagement through public workshops, focus groups, and pop-up outreach spanning New York City, Long Island, and the Lower Hudson Valley. When this region emerged as the early locus of the pandemic, and the prospect of conducting outreach with large groups of people face-to-face became untenable, NYMTC pivoted the *Moving Forward* engagement program to focus on remote and virtual forms of outreach with great care to ensure that diverse and representative input could be obtained. Public workshops were transformed into a series of highly successful interactive virtual workshops.

Appendix H: Regional Freight Plan. Commodity flows, that is the movement of all types of goods determine the need for and utilization of transportation assets and infrastructure. Commodity flow expectations provide an important framework for the planning of physical, operational, or regulatory improvements. This appendix provides background information on the volume and value, and trends, of commodity flows within, to, and from the NYMTC planning area and the larger area comprising 10 regional planning agencies, including NYMTC, in New York, Connecticut, New Jersey, and Pennsylvania. The analysis of commodity flows, in turns, permits evaluations of performance and needs related to multimodal freight networks, facilities, and logistics. The Freight Element presented in this appendix draws from the analysis and evaluations.