

Sector Strategies

Chapter 11. Transportation

11.1 State of the Sector

Overview

Historically, the evolution of transportation systems has served as a catalyst for economic growth, productivity, and land use and development patterns. Transportation investments significantly influence where economic growth ensues, at what rate that growth occurs, and the design and density of the built environment. The challenge is how to balance growth, facilitated by transportation, while mitigating harmful greenhouse gas (GHG) emissions and promoting climate justice. Compounding this challenge are a multitude of factors. Individual consumers have a preference for large, less fuel-efficient vehicles. Short trips are often accomplished by single-occupancy vehicles. Innovations in commerce, such as just-in-time delivery and dispersion of production facilities, have made delivery of goods more inefficient. Local residential land use and commercial-development policies have driven unconstrained sprawl, thereby increasing vehicle miles traveled (VMT) and congestion. These challenges present an opportunity for adopting mobility-oriented development (MOD) strategies through targeted transportation investments.

The challenge of achieving the Climate Act requirements should be approached strategically and with an eye toward recognizing the opportunity and delicate balance of facilitating transportation's role in economic growth with the need to address adverse community, environmental, and human health impacts. To fully implement the requirements of the Climate Act while maintaining economic competitiveness, the State needs the full support of complementary national, regional, and local strategies.

When considering how to reduce transportation GHG emissions, it is important to note that measures for reducing emissions from transportation are interconnected. Actions to achieve the Climate Act goals and requirements transcend the transition to zero-emission vehicles (ZEVs) and include diversified mobility alternatives; promotion of denser, more diverse, better designed, and more transit-oriented land use and development policies; and implementation of market-based policies to influence travel decisions.

As of November 2022, one half of one percent of the over 10 million registered light-duty vehicles (LDVs) in New York were ZEVs.¹⁹⁷ To facilitate the level of transformation required by the Climate Act

¹⁹⁷ Atlas Public Policy. "EVALUATENY Vehicle Deep Dive." Accessed November 2022 at <https://atlaspolicy.com/evaluateny/>.

and accounting for growth in vehicle registrations, there will need to be approximately 3 million zero-emission LDVs in use by 2030 and approximately 10 million zero-emission LDVs in use by 2050. In addition, enhancing the availability, accessibility, reliability, and affordability of public transportation services, with an emphasis on unserved and underserved communities, as well as reimagining residential and commercial development utilizing MOD principles, will be integral to mitigating single-occupant discretionary vehicle trips, associated vehicle congestion, and harmful GHG emissions.

Vision for 2030

An aggressive and implementable mix of policies will be required to accelerate GHG emission reductions to the level needed by 2030. By 2030 nearly 100% of LDV sales and 40% or more of medium- and heavy-duty (MHD) vehicle sales must be zero-emission and a substantial portion of personal transportation in urbanized areas would be required to shift to public transportation and other low-carbon modes.¹⁹⁸ New York can achieve these goals through ZEV sales requirements and accompanying incentives, investments to help achieve these mandates, historic investments in expanded public transportation and micro-mobility, enhanced bicycle and pedestrian infrastructure, smart growth development, market-based policies that support lower-carbon transportation choices, and potentially a clean transportation standard that reduces the average carbon intensity of fuels as the transition to ZEVs proceeds.

Emissions Overview

The transportation sector was responsible for approximately 28% of the New York’s greenhouse gas emissions in 2019, which includes road transportation (59%), non-road such as aviation (12%), emissions from imported fuels (26%), and hydrofluorocarbons used in vehicle air-conditioning and refrigeration (3%). Transportation sector emissions are about 16% higher today than they were in 1990. The transportation sector today is largely dependent on petroleum-based fuels such as gasoline, diesel, and jet fuel, but the State has made strong progress in transitioning from petroleum-based fuels to zero-emission technologies.

The recommended policies are expected to result in as many as three million ZEVs (about 30% of LDVs and 10% of MHD vehicles) on the road by 2030.¹⁹⁹ Electric non-road equipment, such as those used in lawncare, construction, and farming, are expected to gain market share, especially in subsectors that are most conducive to electrification. Hydrogen fuel cell vehicles are expected to begin to emerge into the market by 2030, primarily for some trucking and non-road applications less suited to electrification, and

¹⁹⁸ For more information, refer to Appendix G: Integration Analysis Technical Supplement.

¹⁹⁹ For more information, refer to Appendix G: Integration Analysis Technical Supplement.

the State should begin investing prudently in the required supporting infrastructure to enable these vehicles to play a larger role in transportation emission reductions beyond 2030. Regional collaboration among states and coordination with the federal government will be needed to ensure that ZEV technologies can achieve the hoped-for growth trajectory. Supporting the development of companies in the ZEV supply chain can help create additional economic benefits and ensure a sufficient supply of these vehicles for New Yorkers.

At present, a large portion of vehicles on the road are expected to still use internal combustion engines in 2030, particularly in the MHD vehicle classes. One path to achieving 2030 emissions reduction requirements includes strategies to make limited use of renewable diesel and other lower-carbon fuels to replace diesel in existing internal combustion engine vehicles until the transition to ZEVs is complete. Policies like a clean transportation standard could be designed to support decarbonization by displacing fossil fuels with low-carbon electricity and other fuels with lower GHG emissions and co-pollutant emissions, including green hydrogen and alternative fuels. Development of these policies should be mindful of the Climate Justice Working Group's (CJWG) admonition to avoid fuel policies that extend reliance on fossil fuel infrastructure or allow emissions from fuel combustion to continue to disproportionately impact Disadvantaged Communities. Another path to achieving 2030 emissions reductions requires accelerated ZEV adoption and early retirement of internal combustion vehicles. Additional incentives would be required to achieve these outcomes.

Significant increases in the availability of public transportation services and other zero-emission mobility alternatives in the State's urbanized areas should help reduce VMT by 2030. While mobility-on-demand strategies are expected to be adopted between now and 2030, this is primarily a longer-term emission reduction strategy. System efficiency improvements, such as traffic management systems and other congestion mitigation activities, can curb emissions through reduced idling and can be deployed immediately. Land use policies that shift travel to cleaner shared mobility alternatives or reduce discretionary single occupant VMT provide significant community benefits such as air quality improvements and reduce the number of ZEVs needed to meet GHG emission reduction requirements.

Vision for 2050

By 2050, the transportation sector will need to shift nearly completely to ZEVs while substantially increasing the use of low-carbon transportation modes like public transportation, walking, and biking that reduce the number of personal vehicle trips. LDVs and a large majority of MHD vehicles will be ZEVs. Marine operations and port facilities are envisioned to be zero-emission by 2050. Some segments of hard-

to-electrify subsectors, such as aviation, freight rail, and potentially some MHD vehicles are expected to rely on green hydrogen and renewable biofuels (e.g., renewable jet fuel) to fully replace fossil fuel combustion if zero-emission applications are not feasible. A large-scale investment in expanded public transportation and complementary modes of transportation like shared mobility, biking and walking infrastructure, and smart growth (higher density, mixed use development centered around low-carbon transportation options) will help make it easier for New Yorkers to travel without using a personal car. Trips are expected to be shorter, on average, because people will have easier access to jobs, schools, and services. Transportation system investments will reflect community needs and be appropriate for the people they serve.

Table 8. Sector Spotlight: Timelines for a Just Transition in the Transportation Sector

<ul style="list-style-type: none"> Majority of jobs created by 2030 expected to focus on electric vehicle charging station and hydrogen fuel station installation, along with steady levels of employment in vehicle manufacturing and wholesale trade parts. Emissions projected to decline 30% in this sector by 2030; fossil fuel consumption projected to decline 38% by 2030. Levels of job growth and loss through 2030 are roughly equivalent (~11,000 to 15,000 gained and lost), suggesting opportunity for retention and matching within the sector. Analysis indicates job losses are likely in the most at-risk subsector (conventional fueling stations), but these businesses may be able to adopt new business models (such as becoming hubs for electric vehicle charging equipment at convenience stores), enabling these stations to avoid employment losses associated with declining fossil and biofuel consumption. 			
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Existing clean energy jobs:	61,500	Potential job growth by 2030:	+11,300
		2040:	+21,600
Existing conventional/legacy and fuels jobs:	125,000	Potential job loss by 2030:	-14,900
		2040:	-37,800
		Potential net job creation by 2030:	-3,600
		2040:	-16,200

Note: Job impact data from Jobs Study (Scenario 2 Initial Employment Outputs, rounded to nearest hundred). Jobs figures here may be partial due to differences in sectoral breakdown between Scoping Plan Chapters and Jobs Study; additional analysis found in Jobs Study.

Achieving this 2050 vision will require a mix of regulatory action and investment to achieve widespread ZEV adoption and additional incentives may be required to retire older internal combustion vehicles. The expansion of transportation options and smart growth development practices will rely on extensive investments at the State and local level alongside collaborations between State and local authorities to revise land use rules and coordinate on plans that create an integrated system for travelers choosing low-carbon transportation modes. Public-private collaboration and broad industry action are critical to bring the level of investment needed and to ensure New Yorkers have climate-friendly transportation options available. Market-based policies can help fund the transition and send appropriate price signals.

Importantly, to achieve the 2050 vision, early action and investment will be needed in the early 2020s to ensure the availability and affordability of the future fuels and technologies, including but not limited to green hydrogen production, delivery, and applications; renewable jet fuel or other zero-emission aviation solutions; MHD ZEV engines; and infrastructure to support large-scale electrification including heavy freight solutions.

Existing Sectoral Mitigation Strategies

New York uses less energy per capita for transportation purposes than any state in the nation due in large part to the extensive investment and utilization of public transportation services and compact land use patterns in the State’s larger urbanized areas.²⁰⁰ These services help the State reduce its transportation emissions by more than 17 million metric tons (MMT) per year, but much more needs to be done to meet the Climate Act’s GHG emission reduction requirements. There are currently over 120,000 electric vehicles (EVs) on the road in the State and the number is rapidly growing, with sales in both 2021 and 2022 shattering previous year highs.²⁰¹

New York has several ongoing strategies to promote transportation emissions reductions:

- In 1990, New York State Department of Environmental Conservation (DEC) adopted California’s Low Emission Vehicle program, requiring all new vehicles sold in the State to meet California emissions standards, which are more stringent than federal standards. The goal of the Low Emission Vehicle program is to reduce emissions of air pollutants including particulate matter, nitrogen oxides (NO_x), carbon monoxide, and volatile organic compounds (VOCs). Reducing engine pollution protects the environment and the health of the State’s residents.
- In 2013, the State initiated two major actions in transportation decarbonization programs. First, the State signed the light-duty ZEV Memorandum of Understanding, which formed the Multi-State ZEV Taskforce, a coalition of states working together to advance the deployment of ZEVs through policy research and marketing campaigns. Second, the State launched Charge NY, a series of initiatives that, over time, grew to include the Drive Clean Rebate program, offering up to \$2,000 for electric vehicle (EV) purchases or leases; the New York State Truck Voucher Incentive program, offering incentives of up to \$385,000 for the purchase or lease of electric

²⁰⁰ U.S. Energy Information Administration. August 31, 2020. “More energy is used per person for transportation in states with low population density.” *Today in Energy*. Accessed November 2021 at <https://www.eia.gov/todayinenergy/detail.php?id=44956>.

²⁰¹ Atlas Public Policy. “EvaluateNY” Accessed November 2022 at <https://atlaspolicy.com/evaluateny/>.

trucks and buses; the Charge Ready NY program, offering \$4,000 per Level 2 charging port; and awareness and educational campaigns.²⁰²

- In addition to State-level initiatives, many local jurisdictions and organizations, including counties, cities, utilities, and ports, are aggressively pursuing climate action and transportation GHG emissions reductions. For example, New York City is a member of the C40 Cities Climate Leadership Group that implemented a 2050 carbon neutrality goal (OneNYC 2050) and has already purchased more than 2,000 EVs for its fleet.²⁰³
- To advance light-duty EV adoption, the State launched the Clean Fleets NY program in 2015, which supports deployments of EVs in State government fleets. In 2018, New York Power Authority (NYPA) launched the Evolve NY program, which complements Charge NY 2.0 with an additional \$250 million investment in EV charging infrastructure, services, and consumer awareness efforts. In 2019, the Public Service Commission authorized a \$31 million program to address demand charges for direct current (DC) fast charging devices, and investor-owned utilities began offering a per-plug incentive that tapers down over seven years.
- Through the New York Truck Voucher Incentive Program, administered by the New York State Energy Research and Development Authority (NYSERDA), the State aims to accelerate the deployment of all-electric and alternative fuel trucks and buses in MHD vehicle classes. The program currently includes \$53.9 million in funding and uses funds from the Volkswagen settlement overseen by DEC, as well as the Congestion Mitigation and Air Quality Improvement program overseen by the New York State Department of Transportation (DOT). New York also directed Volkswagen settlement funds (\$9.9 million) to the New York City Clean Trucks Program, which replaced diesel trucks in New York City industrial business zones that are within defined environmental justice areas.
- In July 2020, New York announced two new sweeping programs. First, New York was one of 15 states to sign a MHD ZEV Memorandum of Understanding, with the goal of having 30% of MHD vehicle sales be ZEVs by 2030 and 100% by 2050. Second, New York announced a \$701 million Make-Ready program, through which investor-owned utilities pay up to 100% of the costs of electric facilities necessary to make sites ready for EV charging of 850,000 LDVs by 2025. NYSERDA and the electric utilities are required by Make-Ready to undertake feasibility

²⁰² The PSC made a declaratory Ruling that it did not have jurisdiction over charging stations; the owners or operators of charging stations, so long as the owners or operators do not otherwise fall within the Public Service Law’s definition of “electric corporation;” or the transaction between such owners or operators of Charging Stations and members of the public.

²⁰³ New York City Sustainability Office. 2020.

studies for MHD fleets, including for school districts and transit agencies, to identify benefits, costs, logistical challenges, financing options, other barriers to electrification. By bearing these soft costs, the State is providing fleet managers with the financial information necessary to make the case for investment in zero-emission fleets. The Make-Ready program also included \$85 million for the New York Clean Transportation Prizes, three competitions to identify innovative, replicable approaches to transportation electrification that address climate justice in disadvantaged communities.

- Clean Air NY is a marketing and outreach program in the New York City metro area sponsored by DOT to educate travelers about the small changes they can make every day in their transportation choices. The goal is to reduce VMT and improve air quality. The year-round program, formerly called Ozone NY, includes Air Quality Action Day notifications, indicating unhealthy levels of particulate matter and/or ozone as forecasted by DEC.
- The 2011 New York State Complete Streets Act requires agencies to consider the convenience and mobility of all users, including pedestrians and bicyclists, when developing transportation projects that receive State and federal funding. This initiative presents an opportunity to expand upon existing programs and collaborate with bicyclists, pedestrians, people with disabilities, and others to identify best practices and designs for transportation facilities.
- The State uses federal funding through the Transportation Alternatives Program and the Congestion Mitigation and Air Quality Improvement Program. This is available to State and local governments for zero-emission transportation-related projects/programs (active transportation) and projects/programs to help address the requirements of the Clean Air Act.
- Active transportation safety is promoted through projects developed under the State's Pedestrian Safety Action Plan. This five-year, multi-agency initiative provides \$110 million to improve safety for pedestrians through infrastructure improvements, public education efforts, and enforcement across upstate and Long Island. This Scoping Plan calls for a systemic approach to proactively address widespread safety issues and minimize the potential for crashes by implementing low-cost improvements throughout the roadway network.
- New York State already leads the nation, consuming less fossil fuel per capita than any other state due in large part to a commitment to transit. New York State provides \$7 billion in support to transit operators annually.²⁰⁴ New York State's transit support is more than that of 45 other states

²⁰⁴ New York State Division of the Budget. *New York State Executive Budget FY2023*, p. 152. Accessed November 2022 at <https://www.budget.ny.gov/pubs/archive/fy23/ex/book/briefingbook.pdf>.

combined.²⁰⁵ This support is intended to maintain and enhance service levels, ensure passenger fares are reasonable and equitable, and support environmental/climate and economic goals.

- New York supports municipally sponsored public transportation services' transition to ZEVs through a multi-year funding commitment to provide the incremental cost of procuring all-electric buses.
- In 2022, New York required that by 2027 all new school bus purchases must be ZEVs and by 2035 all school buses operating in the state must be ZEVs. NYSERDA has begun developing a School Bus Electrification Roadmap to help guide future state efforts supporting this work.

These ongoing GHG emission mitigation and air quality improvement strategies contributed to New York's transportation sector progress over the last decade. The variety of these current strategies underscores the need to consider a wide range of new and enhanced strategies to further improve air quality and reduce GHG emissions. These strategies should work in concert to limit the negative effects of climate change and create a sustainable transportation system in New York that serves all its users.

Key Stakeholders

Key stakeholders responsible for the successful implementation of proposed transportation sector strategies include:

- **Transitioning to ZEVs and equipment:** DEC, NYSERDA, DOT, New York State Department of Public Service (DPS), New York City Department of Buildings, New York State Department of Motor Vehicles, New York State Office of General Services (OGS), New York State Department of State (DOS), New York State Education Department, NYPA, Dormitory Authority of the State of New York (DASNY), NY Green Bank, Port Authority of New York and New Jersey (PANYNJ), Metropolitan Transportation Authority (MTA), New York City, utility companies, automotive original equipment manufacturers, EV charging station providers, car and truck dealers, affected workers and unions, port operators, transit agencies/authorities/municipal sponsors, and the New York State Legislature
- **Enhancing public transportation and mobility alternatives:** NYSERDA, DOT, DPS, OGS, DOS, NYPA, MTA, utility companies, vehicle manufacturers, affected workers and unions, and transit agencies/authorities/municipal sponsors

²⁰⁵ Federal Transit Administration. "2021 Funding Sources." Accessed November 2022 at <https://www.transit.dot.gov/ntd/data-product/2021-funding-sources>.

- **Reduce VMT:** DEC, NYSERDA, DOT, DPS, DOS, NYSTA, NYPA, Empire State Development (ESD), MTA, New York City, New York State Council on the Arts, transit agencies/authorities/municipal sponsors, local governments, companies providing mobility services, major New York employers, affected workers and unions, and the New York State Legislature
- **Market-Based Solutions and Financing:** DEC, NYSERDA, DOT, DPS, New York State Department of Motor Vehicles, New York State Education Department, New York State Department of Taxation and Finance, NY Green Bank, and local governments

11.2 Key Sector Strategies

The key strategies within this sector are organized into four themes, as shown in Table 9. As described there in greater detail, the labor standards discussed in *Chapter 7. Just Transition* are intended to apply throughout this Scoping Plan, including for the transportation sector, as a means of promoting good, family-sustaining, union jobs accessible to all New Yorkers and achieving a true just transition.

Table 9. Transportation Sector Key Strategies by Theme

Theme	Strategies
Transition to ZEVs and Equipment	T1. Light-Duty ZEV Adoption T2. Adoption of Zero-Emission Trucks, Buses, and Non-Road Equipment
Enhance Public Transportation and Mobility Alternatives	T3. Community-Based Service Enhancements T4. Customer Convenience and Service Connectivity T5. Fleet Modernization and Electrification
Promote Smart Growth and Mobility-Oriented Development	T6. Mobility-Oriented Development T7. Smart Growth Public Education and Awareness T8. Expanding the Availability of Low-Carbon Active Transportation Alternatives T9. New Technology Integration
Facilitate Market-Based Solutions and Financing	T10. Transportation Sector Market-Based Policies T11. Unlock Private Financing T12. Market-Based Fuel Policy

Recognizing that there is no one-size-fits-all statewide strategy for effectively reducing emissions from the transportation sector and transitioning to zero-emission technologies, the Climate Action Council (Council) expects many of the strategies necessary to achieve the Climate Act’s ambitious requirements and goals will be informed through extensive engagement and outreach with affected communities, with an emphasis on overburdened and low- to moderate-income (LMI) areas.

Transition to Zero-Emission Vehicles and Equipment

Transitioning the transportation sector to zero-emission technologies is central to achieving the State’s GHG emission reduction requirements. In most cases, this means replacing existing vehicles that run on gasoline or diesel fuel with either battery electric, hydrogen fuel cell, or future zero-emission propulsion technologies. ZEVs and their related infrastructure present an economic development opportunity as well, offering a chance to build on New York’s robust historical involvement in manufacturing and supplying vehicles and vehicle components. Other alternative fuels will play a role in decarbonizing hard-to-electrify segments of the transportation sector.

On September 8, 2021, Governor Hochul signed legislation establishing a goal that all new LDVs and non-road vehicles sold in the State be zero-emission by 2035 and all new MHD vehicles be zero-emission by 2045.²⁰⁶ To help meet the State’s Climate Act requirements and goals, New York should take additional regulatory and programmatic actions to achieve these goals. The strategies proposed below aim for an even more rapid transition to ZEVs, achieving close to 100% ZEV sales for LDVs by 2030, 50% ZEV sales of medium-duty vehicles by 2030, and 80% ZEV sales of heavy-duty vehicles by 2035, which the integration analysis indicates will position the State to meeting the Climate Act requirements. The strategies to achieve these goals involve expanding light-duty ZEV adoption and converting trucks, buses, and other MHD vehicles to ZEVs.

T1. Light-Duty Zero-Emission Vehicle Adoption

There are approximately 9 million LDVs in New York, making the emissions from LDVs the largest component of transportation emissions.²⁰⁷ Since 2010, sales of light-duty ZEVs have increased and accounted for more than 3% of all LDV sales and about 1% of all LDVs on the road in 2021. Light-duty ZEVs have come down in price compared with their petroleum-fueled counterparts but are still comparatively more expensive; they are expected to reach price parity from a total cost of ownership perspective in the next two to four years and from a purchase price perspective later in the 2020s. Most light-duty ZEVs are expected to be battery electric, but hydrogen fuel cell vehicles are emerging into this market, primarily in California. A key challenge is that most of these vehicles are owned by individuals, who will each have to make their own purchase decisions if the State is to meet its Climate Act requirements. Achieving the aggressive transition in this market will require a mix of regulations, incentives (which will require identifying new sources of funding), and removal of market barriers. It will

²⁰⁶ Chapter 423 of the Laws of 2021.

²⁰⁷ Atlas Public Policy. “EValuateNY.” Accessed October 2021 at <https://atlaspolicy.com/evaluateny/>.

also depend on industry greatly accelerating the expansion of production capacity for these vehicles. Incentives for EVs and charging stations are expected to be needed primarily over the next five to 10 years, as the market for ZEVs reaches maturity. Enhanced incentives for LMI consumers will advance climate justice and achieve the air quality benefits in Disadvantaged Communities these vehicles can provide. Incentives for hydrogen fuel cell vehicles may be needed for a longer period of time, as they are expected to take longer to enter the market in significant quantities.

The CJWG enthusiastically encourages a rapid transition to ZEVs, although it cautioned that focusing on providing access to transit and lower-cost options for transportation, rather than just personal vehicles, is critical for LMI New Yorkers. The CJWG also expressed concern about investment in EVs leaving the State. Of course, most of the billions of dollars that New Yorkers spend on petroleum-based fuels each year leaves New York; accordingly, the State should continue supporting the development of businesses in the ZEV supply chain to ensure that the ZEV transition benefits the State's residents economically.

Components of the Strategy

- **Adopt California's Advanced Clean Cars 2 Regulation:** Chapter 423 of the Laws of 2021 commits 100% of all new, light-duty on-road vehicle sales in New York to be ZEVs by 2035, and directs DEC to develop and propose regulations, to the extent consistent with federal law, such as Advanced Clean Cars 2.²⁰⁸ DEC should adopt the Advanced Clean Cars 2 regulation that requires 100% light-duty ZEV sales by 2035, now that it has been finalized by California. California is also pushing to electrify for-hire vehicles through a clean-miles standard, which the State could also adopt or take other approaches to electrifying these vehicles, such as providing targeted incentives for fleet ZEV purchases and charging/fueling stations.
- **Provide enhanced ZEV purchase incentives:** ZEVs are approaching price parity with petroleum-fueled vehicles and the price of battery EVs is expected to eventually fall below that of their petroleum equivalents. Offering strategic incentives will accelerate ZEV production, price parity, and purchases. New York should enact legislation to establish a "feebate" program that would offer direct rebates for ZEV purchases supported by imposing a fee on purchases of fossil fuel vehicles. The fee and rebate levels should be dynamic in response to market conditions and ambition levels. Such a program can be designed to be revenue-neutral and can incorporate other policy goals, such as higher rebates for LMI customers and exemptions from the fee for lower-

²⁰⁸ ECL § 19-0306(b).

priced vehicles purchased largely by LMI consumers. Feebates should be applied to new car sales, but there should be an additional rebate for used ZEVs targeted toward LMI customers, which could be paired with affordable financing options. Although each integration analysis scenario under consideration relies heavily on LDV electrification, the scenario that relies more heavily on expedited electrification will require the establishment of additional incentives to retire internal combustion vehicles early.

- **Enhance ZEV awareness and reduce sales barriers:** New York should enact legislation to expand direct-to-consumer sales of ZEVs by manufacturers, which can serve to increase the availability and sales of ZEVs in the State; the State should provide dealer incentives for franchise car dealers to sell ZEVs; and NYSERDA should partner with industry participants and stakeholders to fund consumer engagement activities to increase consumer interest in ZEVs.
- **Invest in and remove barriers for ZEV charging and fueling infrastructure:** To support the level of ZEV adoption anticipated by 2030, New York must quickly increase the number of EV charging stations and hydrogen filling stations in the State. New York should fund rebates or investment in EV charging stations and hydrogen filling stations, either directly through programs run by NYSERDA and/or NYPA or through market-based mechanisms like the clean transportation standard discussed below that would generate resources for ZEV infrastructure. All financing and ownership models should be considered. As part of the State's focus on investments in Disadvantaged Communities, programs in this area should focus on charging at multi-unit dwellings, on-street charging, and convenient urban fast charging, especially in areas with less access to home charging. Strategies should also prioritize fast charging along travel corridors, especially in rural areas, and support market segments that have been slow to attract private investment, including hydrogen fueling stations for appropriate applications. Through the National Electric Vehicle Infrastructure formula program, DOT will identify opportunities to support the creation of a safe, reliable, convenient, and equitable EV fast charging infrastructure network to allow EV drivers to reach interstate, regional, and long-distance destinations. DOS should incorporate EV charging into building codes to ensure new construction is EV-ready.
- **Enact utility rate design changes:** The New York State Public Service Commission (PSC) should direct utilities, as appropriate, to implement programs that offer lower rates for or otherwise encourage off-peak charging and/or controlled, managed charging. The PSC should further examine the effectiveness of its per-plug incentive program to determine if it offers sufficient opportunities to reduce operating costs that support the near-term buildout of public and fleet charging infrastructure. It is important to make this type of charging more cost-effective when utilization is low, and the PSC should determine whether a change is necessary in the

structure of demand chargers that is cost-based and nondiscriminatory. The PSC and NYSERDA should also consider how to maximize the value of ZEVs as grid-interactive assets and storage devices, which could potentially lower electric grid upgrade costs and generate revenue for ZEV owners. They should also consider whether any policy changes are required to enable these use cases. These changes will be relevant to both LDVs and MHD vehicles.

- **ZEV workforce and economic development:** State University of New York (SUNY), New York State Department of Labor (DOL), ESD, NYSERDA, and other relevant agencies should expand the availability of ZEV-focused workforce development curricula related to ZEV maintenance and EV charging station installation and maintenance. These curricula should target both retraining the current workforce and preparing new entrants into the workforce to operate and maintain ZEVs and their associated infrastructure. Additionally, ESD, NYPA, and NYSERDA should seek opportunities to attract businesses to New York that develop and/or manufacture ZEVs, ZEV components, and ZEV-supportive products. Economic development opportunities can leverage New York’s leadership on ZEVs to attract companies to locate in the largest committed market for ZEVs on the East Coast.
- **State fleet:** In accordance with Executive Order 22, each state agency/authority shall adopt and periodically revise procurement targets, with appropriate funding allocated, to operationalize the State’s announced November 2021 commitment to a fully zero-emission State fleet of passenger vehicles by 2035. DEC should continue supporting municipal ZEV acquisition by providing rebates under the Climate Smart Communities program.

T2. Adoption of Zero-Emission Trucks, Buses, and Non-Road Equipment

Converting New York’s trucks, buses, and non-road equipment (including construction, farm, and forestry equipment) to zero-emissions technologies plays a dual role of both reducing GHG emissions from a major source and reducing local air pollution from one of the most significant sources of poor air quality and adverse health impacts. Trucks, buses, and non-road equipment are just starting to transition from diesel fuel to electricity as more options become available, but electric trucks, buses, and equipment are still much more expensive than their diesel counterparts. The transition to ZEVs for this subsector will entail a mix of battery electric and hydrogen fuel cell vehicles, which are just beginning to emerge into the market. Achieving the aggressive transition in this market will require a mix of regulations, incentives (which will require identifying new sources of funding), and the removal of market barriers and depends on industry greatly accelerating the expansion of production capacity for these vehicles. Incentives for EVs and charging stations are expected to be needed primarily over the next 10 to 15 years, as the market

for ZEVs reaches maturity. Incentives for hydrogen fuel cell vehicles may be needed for a longer period of time, as they are expected to take longer to enter the market in significant quantities.

Diesel trucks and port equipment are one of the largest sources of local air pollution in Disadvantaged Communities. Although they comprise only a small portion of total vehicles in the State, diesel trucks and buses are responsible for 30% of total particulate matter and NO_x emissions from mobile sources. Replacing diesel trucks and port equipment with ZEV trucks and equipment is a critical component of climate justice and would have a substantial impact on improving air quality statewide, especially in Disadvantaged Communities.

Replacing diesel trucks and port equipment with ZEV equivalents also provides an opportunity to generate economic development opportunities in New York. As New York is a major market for diesel vehicles, especially transit buses and school buses, its early leadership can provide a strong market signal for companies looking to locate near their end users. For instance, New York's nation-leading mandate that all school buses be zero-emission by 2035 provides a strong incentive for ZEV school bus manufacturers to locate in New York, especially considering that New York has more school buses than any other state in the country.

The CJWG enthusiastically encourages a rapid transition to ZEVs, especially for MHD vehicles. Consistent with CJWG input, this Scoping Plan prioritizes MHD ZEV incentives for vehicles such as port equipment, refuse trucks, local delivery vehicles, construction equipment, and both transit and school buses in communities overburdened with air pollution, and includes an accelerated transition of the State's fleet vehicles to ZEVs.

Components of the Strategy

- **Adopt additional Clean Fleets regulations:** In 2020 California promulgated the Advanced Clean Trucks regulations that require an increasing percentage of new zero-emission MHD truck sales annually through 2035. In December 2021, DEC finalized the adoption of these regulations.²⁰⁹ DEC should also adopt certain components of California's proposed Advanced Clean Fleets regulations, or equivalent measures. Specifically, DEC should adopt (1) the drayage truck regulation that would require the transition of predominantly diesel-powered drayage fleets

²⁰⁹ 6 NYCRR Part 218; 6 NYCRR Section 200.9.

to ZEV trucks with any NY-specific adjustments; (2) the regulation requiring federal and "high priority" fleets to transition to ZEVs; and (3) the requirement for 100% MHD ZEV sales by 2040. These regulations could be targeted to the type of fleets operating in overburdened communities and, like California, exclude smaller fleets largely operated by small businesses. In accordance with the legislation signed by Governor Hochul cited above, DEC should consider regulatory options, consistent with federal law, for requiring 100% ZEV sales for non-road vehicles by 2035.

- **Provide enhanced ZEV purchase incentives:** Zero-emission trucks, buses, and non-road vehicles are significantly more expensive than diesel equivalents today. While the cost of ownership is becoming more cost-competitive, targeted incentives will be needed to facilitate the transition to emerging ZEV technologies. The State should fund direct incentives supporting the purchase of zero-emission trucks and buses, with a focus on fleets operating in LMI and overburdened communities, small fleets, and school buses, as well as non-road vehicles and equipment such as airport ground support equipment, port cargo handling equipment, construction, farm, and forestry equipment. The State should also provide incentives or offer buybacks for equipment with small engines, including yard and garden equipment and small marine vessels, and encourage local electrification requirements.
- **State fleet:** In accordance with Executive Order 22, each state agency/authority shall adopt and periodically revise procurement targets, with appropriate funding allocated, to operationalize the State's November 2021 commitment to a zero-emission State fleet of MHD vehicles, where technically feasible, by 2040.
- **Require use of ZEV equipment by State contractors and at targeted facilities:** To further encourage ZEV adoption, New York should enact legislation that establishes procurement and contracting rules to increase the percentage of zero-emission equipment and vehicles used for State-funded projects, including contractors and subcontractors, based on production and availability, to again align with the State's November 2021 commitment. DEC should also adopt regulations similar to California's Advanced Clean Fleets proposal that require MHD trucks in use at, or accessing, certain types of facilities such as ports or intermodal railyards to be ZEVs by a set date. DEC should evaluate the date based on factors that may include truck vocation, product, and related infrastructure availability.
- **Invest in ZEV charging or fueling infrastructure:** Similar to LDV infrastructure, the State should provide rebates or direct investment in EV charging stations and hydrogen filling stations, where market support is needed. Preference for investments should be provided to fleets that operate in communities that have been disproportionately burdened by the impacts of air

pollution. DPS should continue to work with utilities to plan for expected service levels needed to support the electrification of MHD fleets, especially in Disadvantaged Communities where such depots tend to cluster.

Enhance Public Transportation and Mobility Alternatives

One of the more impactful supporting strategies for achieving the Climate Act’s energy efficiency, housing, and land use GHG emission reduction requirements is through enhancing the availability, accessibility, reliability, and affordability of public transportation services with an emphasis on unserved and underserved communities. The strategies to achieve these goals involve service enhancements, MOD, convenience and connectivity, and fleet modernization. These strategies, along with others discussed under *Smart Growth and Mobility-Oriented Development*, will reduce VMT compared with business-as-usual by providing alternatives to driving personal vehicles. For the purposes of this Scoping Plan, public transportation includes but is not limited to transit, micro-transit, shared mobility, and longer-distance passenger rail services.

T3. Community-Based Service Enhancements

MTA enhancements should focus on policies and programs that support system reliability, resilience, and network expansion projects identified in its current five-year capital plan and 20-year needs study.

Recognizing that the service needs of communities will vary throughout the State, enhancements are intended to be locally derived and tailored to achieve the maximum utilization and GHG emission reductions. This may include but not be limited to increasing the number of routes, increasing service frequency, increasing the number of scheduled stops to facilitate last mile connectivity, introducing demand response services, partnering with mobility providers, providing direct connectivity to longer-distance bus and passenger rail services, incorporating shared mobility and micro-mobility into transit offerings, or a combination of these and other service modifications. Providing and expanding access to public transportation in the context of business location and economic development will help provide access to jobs and reduce the time and expense to commute to places of employment.

CJWG feedback included the need to provide more detail on what specific public transportation enhancements were proposed and how enhancements would be identified and accomplished. As detailed below, these issues are intended to be addressed

Downstate services provided by municipalities other than the MTA is defined as services provided, directly or under contract by, municipalities in the Metropolitan Commuter Transportation District as designated in Public Authorities Law § 1262.

through context appropriate community-based discussions. The CJWG also emphasized the need to think beyond traditional urban public transit and enhance inter-regional rail transportation.

Components of the Strategy

- **Identify, plan, and implement service enhancements and offer additional shared mobility and micro-transit services:** The State should work with communities and service providers to design strategies that increase utilization of existing and new public transportation options and alternatives. Strategies should be context-specific and will differ between urban, suburban, and rural communities. Public transportation service enhancements are intended to be further informed through community-based discussions. For example, availability/accessibility may refer to an increase of service hours/frequency, an increase in routes, and/or an increase in the number of stops along a route. It is anticipated that a combination of approaches will be required in most communities.
- **Strengthen New York’s rail network:** The State should work with federal partners to improve the reliability of intercity passenger rail service and strengthen the freight rail system. These improvements will provide New Yorkers with additional low-carbon options for longer-distance travel and improve the environmental sustainability of the goods movement system.

In addition to State agencies identified as key stakeholders for the transportation sector, others responsible for the implementation of these strategies include the federal departments of Transportation, Housing and Urban Development, and Energy, and the U.S. Environmental Protection Agency (EPA).

T4. Customer Convenience and Service Connectivity

In addition to providing high-quality amenities at public transportation facilities, including sidewalks, seating, lighting, electronic customer information (next-bus), the State should assess ways to implement strategies for making public transportation easier to use and more competitive on a travel time basis. This includes simplified and integrated fare media, dedicated bus lanes and intelligent transportation/bus signal prioritization, and deploying new phone-based application technologies that make public transportation more logical/easier to understand. These enhancements will facilitate increased use of public transportation in support of reducing VMT. Current efforts underway in the State to enhance convenience and connectivity include the implementation of micro-mobility services in the Capital Region, the realignment of services to support jobs and job training in the Finger Lakes Region, and the deployment of new integrated service, trip planning, and fare payment apps in the Southern Tier Region.

The CJWG supports increased investments in enhanced public transportation alternatives and noted that doing so creates jobs in local communities, offering employment opportunities for workers in Disadvantaged Communities. In addition, the CJWG suggests offering incentives to companies in transit manufacturing for designating that a certain proportion of their workforce be hired from Disadvantaged Communities.

Components of the Strategy

- **Improve public transportation ease of use:** The State should facilitate the development and implementation of strategies for making public transportation easier to use. This includes working with the public and private sector on simplified and integrated statewide fare media and deploying new phone-based application technologies that makes public transportation more logical and easier to navigate.

T5. Fleet Modernization and Electrification

Recognizing that bus maintenance/service facilities are historically more likely to have been located near or within LMI communities, the State is committed to accelerating the deployment of zero-emission buses, which will mitigate GHG emissions and noise pollution. As part of this transition, the State should continue to support electrification of buses and other service vehicles appropriate for the communities being served.

The CJWG requested more detail to confirm what “make ready costs” include. As described below, the term “make ready costs” in this context describes the utility infrastructure costs associated with bringing the power needed and the building modifications needed to support facilities to facilitate electric bus charging.

Components of the Strategy

- **Transition to zero-emission public transportation fleets:** The State should work with municipally sponsored public transportation systems on a plan to transition to all-electric, zero-emission public transportation vehicles at defined replacement schedules appropriate for the transit provider. The State has already taken action to implement this strategy by:
 - Committing more than \$100 million toward the electrification of 25% of the five largest fleets, outside the MTA, by 2025 and 100% by 2035 (MTA has committed to purchase only electric buses after 2029 and to fully electrify its fleet by 2040)

- Directing a significant portion of the \$45 million in funding available through the Volkswagen settlement funds to assist public transportation providers with the replacement of existing diesel buses with more than 100 all-electric transit buses
- Expanding Charge Ready NY incentives for Disadvantaged Communities and enhancing options for electric transit bus procurements
- Supporting the deployment of all electric transit buses through the New York Truck Voucher Incentive Program
- Improving electric fleet economics for developers by supporting the Make-Ready program, which promotes EV charging station deployment

Barriers to implementation include funding as well as federal “payback” if vehicles financed with federal funds are replaced prior to the end of the Federal Transit Administration–rated service life.

In addition to State agencies identified as key stakeholders in this chapter, others involved in the implementation of these strategies include the U.S. Department of Transportation and the municipal owners of the vehicles and infrastructure.

Smart Growth and Mobility-Oriented Development

Smart growth land use patterns facilitate reductions in GHG emissions in the transportation sector by reducing VMT, increasing the viability and practicality of low-carbon transportation modes, and decreasing the travel distance between locations through a denser concentration and mix of residential and commercial development. Personal travel is often enhanced by the increased availability of mobility alternatives, including walking, biking, and public transportation. Taking a holistic approach to community development and MOD can help expand transportation options and economic opportunity in urban, suburban, and rural communities, although it will look different in different contexts. Strategies like MOD and expanded mobility options reduce the environmental footprint of transportation on communities and provide increased access to existing services such as healthcare, retail, hospitality, and entertainment while attracting new services, and can be designed to encourage mobility-rich affordable neighborhoods.

Smart growth strategies to reduce transportation GHG emissions fall within four categories: MOD, public education and awareness, expanding the availability of low-carbon transportation alternatives, and new technology integration. A broader set of smart growth strategies and recommendations are contained within *Chapter 19. Land Use*.

T6. Mobility-Oriented Development

To reach GHG emissions reduction requirements, the State should place greater emphasis on programs and projects that enable greater use of public transportation and other low-carbon mobility alternatives and investments that are informed by criteria that maximize sustainable land use/development patterns and climate outcomes. Because smart growth and new development happens over decades, starting as early as possible is important. Strong collaboration between the State and local governments is critical for these strategies to be effective, as most land use decisions fall under the purview of local governments. These strategies may not be applicable in every community, but many different variations on MOD are possible in communities of different sizes and densities. The CJWG expressed support for the expansion of low-cost transportation options accessible to underserved communities, a key element of MOD.

While the State currently incorporates public transportation needs into efforts to attract and retain businesses, New York should implement incentives and policies for businesses and localities for development located adjacent to and integrated into public transportation services.

Examples of integrated supportive policies and incentives to facilitate mobility-oriented development include:

- **Capital District Transportation Authority:** Recognizing that there is no one size fits all mobility solution, working with the communities that make up the multi-county transportation district, Capital District Transportation Authority has implemented an innovative and diversified range of mobility alternatives, including several high frequency/high quality bus rapid transit lines; regional ride-matching; bicycle and electric scooter sharing; and micro-transit services. The goal is to support rezoning and development that is occurring within the central business districts of Albany and Troy and to promote sustainability and environmental stewardship.
- **MTA/Developer Collaboration on One Vanderbilt Development Project (adjacent to Penn Station):** MTA worked with City Zoning and the developer early to secure transit access improvements (such as easements, stairways, and elevators) at the developer's expense in exchange for added density.
- **Niagara Frontier Transportation Authority Metro Amherst Extension:** The Niagara Frontier Transportation Authority and Town of Amherst planners are developing proposed plans and zoning to promote both transit-oriented development and mobility-oriented development along the proposed extension of Buffalo's Metro light rail system into the town.

Components of the Strategy

- **Coordinate investments in MOD:** New York should establish an interagency, multi-stakeholder, multi-disciplinary strategy to coordinate investments in and around mobility centers, which should include DOS, DOT, ESD, DASNY, DEC, NYSERDA, DOL, the Office of Just Transition, and other relevant agencies.
- **Tie incentives for business development to mobility access:** ESD should expand and institutionalize its initiatives to incorporate public transportation needs into efforts to attract and retain businesses. This includes implementing incentives and policies for developments that are located adjacent to and integrated into public transportation services, including incentives for businesses to accommodate non-vehicular commuting, such as employee-based trip reduction programs, low-/no-cost transit passes for employees, micro-transit options for employees, ride-sharing programs, bike-sharing and scooter-sharing, and cycling accommodations.
- **Revise design manuals:** To further guide MOD, DOS should facilitate, in cooperation with municipalities, the reimagining of the design manual used by local governments and developers for the construction of buildings, roadways, parking, and bicycle and pedestrian amenities. This updated manual should address both public infrastructure and buildings and how they can be designed to support clean transportation options in urban, suburban, and rural contexts. DOS should support municipalities in eliminating or reducing parking minimums and maximizing access to other mobility alternatives.
- **Designate priority development areas:** DOS and ESD should designate priority development areas to concentrate development and make it easier to build in areas that facilitate low-carbon transportation modes. All types of communities can benefit from this type of focused development area, regardless of size and density. Development incentives should focus on building transportation-related infrastructure in these areas. Such an initiative would provide the greatest climate and public health benefits when combined with other Climate Act strategies,

Examples of such incentives currently in place include:

- **Onondaga Industrial Development Authority:** Developers seeking tax credits receive preference for proposals that incorporate transit-accessibility into their proposals. If a development requires transit service, they must address the issue in their proposal before submitting a request for a tax incentive.
- **Buffalo Green Code's Transit-Supportive Development Incentives:** Buffalo's form-based code will grant a "zero-parking" waiver to projects that meet the criteria for being "transit-supportive," developers must also submit transportation demand management plans to qualify.

including housing and power generation. Additionally, such an effort should consider and not conflict with New York State Homes and Community Renewal (HCR) Well-Resourced areas.

T7. Smart Growth Public Education and Awareness

Public perception is critical to understanding and expanding smart growth. There are common misperceptions about the principles of smart growth and their effects on municipalities, particularly density, mixed-uses, mixed income/affordable housing, and sometimes transit itself. Helping the public understand the benefits of smart growth and public transportation to the climate, energy, socioeconomic equity, fiscal, economic, and public health removes some of the many barriers to successfully completing these projects. Emphasizing the links between transportation investments (particularly public transportation) and land use and development outcomes, particularly as it relates to socioeconomic equity, will help generate support for these measures.

The CJWG is supportive of smart growth and the many benefits that flow from this strategy. The CJWG, along with the Council, recognizes that these types of projects require community buy-in, which only comes through greater public education and awareness.

Components of the Strategy

- **Define benefits of smart growth:** DOS and DOT should produce research and materials that demonstrate the links between planning and transportation in New York, including impacts on local finances and equity. This should include fiscal impact analyses of smart growth compared with sprawl, regarding both public infrastructure investments for each and tax revenues generated. The agencies should also conduct additional analysis on the equity impacts of smart growth and ways to increase affordability of smart growth developments.
- **Conduct public education campaign:** Led by DOS, the State should develop and launch an expansive, multi-dimensional, grass-roots public education campaign on the links between smart growth, transportation, transit, and housing; their roles in reversing climate change; best practices for sustainable smart growth actions at the local level; and the many benefits of smart growth. These materials should be developed in concert with an online, iterative, interactive Sustainable Development Handbook.

T8. Expanding the Availability of Low-Carbon Transportation Alternatives

MOD and priority development areas are highly dependent upon the availability of low- and zero-emission transportation alternatives to complete the first mile/last mile of trips. This includes prioritizing

the availability of safe and accessible pedestrian and bicycle amenities, high quality and frequent transit, and mobility-on-demand services. As part of future investments, agencies and authorities should be required to prioritize low- and zero-emission transportation infrastructure in all activities, where feasible, and link these investments to supportive land use policies that enable greater use of low-carbon mobility options. DOT will prioritize opportunities to invest in Scoping Plan strategies including low- and zero-carbon transportation alternatives utilizing appropriate federal funding such as the Carbon Reduction Program, the Transportation Alternatives Program, and the Congestion Mitigation and Air Quality Improvement Program.

The technology surrounding low- and zero-emission first-mile/last-mile mobility will help guide individual choice. As such, the State should facilitate the development and deployment of applications (apps) to make mobility alternatives and multi-modal trips more attractive, accessible, and user-friendly.

The CJWG is supportive of the expansion of low-cost transportation options accessible to underserved communities, a key element of this strategy.

Components of the Strategy

- **Update the Smart Growth Public Infrastructure Policy Act:** The State should enact legislation to amend and strengthen the State’s Smart Growth Public Infrastructure Policy Act (ECL Article 6) to more effectively avoid new State infrastructure spending that would promote sprawl and define and prioritize priority development areas, such as TOD. This is discussed further in *Chapter 19. Land Use*.
- **Fund low-emission zones and car-free streets:** The State should prioritize investments in local projects that establish low-emission transportation zones, car-free streets, and similar concepts that encourage travelers to take alternative transportation modes and support the infrastructure required to shift freight to lower-emission modes, like rail, cargo bikes, and electric trucks.
- **Fund mobility options:** The State and metropolitan planning organizations (MPOs) should prioritize, incentivize, and expand access to funding for bike, pedestrian, transit, and complete streets projects that serve employment and population centers. These expansions in mobility options should be complemented by supportive land use policies that enhance the viability of these low-carbon transportation modes.
- **Expand partnerships with businesses:** ESD should encourage businesses seeking economic development incentives (local or State) to consult transit agencies early when seeking to locate or expand in areas with existing multi-modal options and to provide services for employees

(employee-based trip reduction programs, transit/micro-transit services, ridesharing, bike-sharing, cycling accommodations, free/reduced transit passes). DOS and DOT should provide technical assistance to these businesses and New York should offer local and State tax credits for businesses that accommodate employee public transportation and transportation demand management alternatives and for employees who use alternative mobility options.

T9. New Technology Integration

New mobility solutions also require a rethinking of the technology people use to travel and access transportation services. Emerging technologies like automated vehicles (aVs), shared mobility services, and Internet-of-Things-enabled infrastructure could be used to reduce energy use and emissions from transportation if used in a coordinated and constructive manner. Setting the right rules for technology and data use and investing in demonstrating technologies that enable low-carbon modes of transportation can help enable equitable, clean transportation solutions.

Components of the Strategy

- **Support intelligent transportation systems and aVs that save energy:** NYSERDA should invest in research, development, and demonstration (RD&D) and demonstrations of emerging intelligent transportation systems, connected vehicles and aVs, and fund the broader adoption of technologies that prove effective in improving transportation system efficiency, such as smart parking systems, adaptive traffic lights, and Internet-of-Things-enabled streetlights. New York should enact policies discouraging “empty” AV miles traveled and requiring aVs used as for-hire vehicles to be ZEVs.
- **Make data accessible and secure:** DOT, New York State Thruway, and the New York State Office of Technology Services (ITS) should support the adoption of open-source technologies and standard data collection protocols for transportation data and connected infrastructure. ITS should convene an interagency group to develop strategies to combat cybersecurity risks associated with new transportation technologies, such as aVs and EV charging.
- **Enable user-friendly apps through data sharing with transit operators:** MTA and other transit operators should facilitate the development of electronic mobility platforms offering seamless multi-modal trip planning and payment options to make public transportation more attractive, accessible, and user-friendly.

Facilitate Market-Based Solutions and Financing

The strategies and policies referenced in this chapter for decarbonizing the transportation sector will require substantial private and public investment. These investments should be facilitated, in part, through market-based and other supportive policies that generate resources necessary to implement investments required to achieve the Climate Act requirements and goals. Some of the recommended policies animate the flow of private capital while others provide a source of public funding. These policies can also provide a market signal, encouraging private action that reduces emissions, from an increased use of public transportation to the purchase of lower-emitting vehicles. The strategies to achieve these goals include transportation sector market-based policies, unlocking private financing, and developing a clean transportation standard.

T10. Transportation Sector Market-Based Policies

Market-based policies focused solely on the transportation sector can provide the dual benefits of discouraging more costly carbon-intensive behavior and providing a revenue source for investment in other strategies. One such policy in the development process is the implementation of congestion pricing in the Manhattan Central Business District. Congestion pricing, which reduces emissions by pricing driving and, through a system of variable tolling, provides a funding source for enhancements in the region's low-carbon public transportation system. Other market-based policies recommended for adoption are described below.

Components of the Strategy

- **Variable pricing/parking policies:** Similar to congestion pricing, these policies discourage driving into and parking in central cities through a system of fees, the collection of which can be used to support alternatives to driving such as public transportation and cycling infrastructure. Pricing policies could include variable fees that discourage parking at peak times or demand parking policies, which limit parking to certain users or vehicles, including ZEVs. Generally, these policies would be adopted by municipalities, but the State can play a supportive role through, for example, development of model code language.
- **Vehicle registration fees:** The State should enact legislation establishing a system of registration fees that would discourage the purchase and continued use of more carbon intensive vehicles. These fees would vary based on emissions or attributes related to emissions such as a vehicle's weight and/or drive train. If accompanied by incentives for lower-emitting vehicles, this approach would resemble the feebate program discussed above under the ZEV strategies (T1. Light-Duty Vehicle Adoption).

- **Mileage-based user fees:** The State should enact legislation to establish a per-mile fee system to fund investment in transportation infrastructure. This system would reduce emissions by discouraging driving, although consumers are generally quite price insensitive to such systems. Thus, although mileage-based users fees could effectively replace declining gas tax revenues, they may not have a significant impact on incentivizing ZEVs or lowering emissions.
- **Tax increment financing/Special assessment districts:** Municipally adopted special assessment districts provide a mechanism to finance public transportation investments. For example, New York City funded investment in the extension of the 7-Line with assessments on properties in the Hudson Yards redevelopment project.

T11. Unlock Private Financing

The use of EVs yields substantial savings in fuel consumption and reduced maintenance over the life of the vehicle. Analyses indicate that the total cost of ownership of ZEVs, both LDVs and MHD vehicles, is nearing parity, and is expected to be achieved across all vehicle classifications by the end of this decade. However, the higher initial cost of ZEVs presents an obstacle to purchasers unable or unwilling to bear the upfront cost to reap savings in the longer term.

The CJWG is supportive of measures to accelerate truck and bus electrification and provide financing opportunities to those who generally lack access to affordable capital, which is the focus of this strategy.

Components of the Strategy

Several financial strategies can be utilized to reduce the obstacles posed by the higher initial cost:

- **Establish a First Loss Protection product based on existing financial market instruments and practice:** The purchase of ZEVs can be facilitated by increasing the availability of low-cost capital/bank loans to fund the higher upfront costs of commercial ZEVs. One area of uncertainty that inhibits banks and other financial institutions from financing the purchase of ZEVs, however, is uncertainty about the residual value of the vehicles being purchased. New York should identify a State agency or authority to guarantee at least a portion of the residual value of the ZEVs being financed at the end of the loan term (such as First Loss Protection). Providing that certainty will help unlock the lowest-cost private financing needed, further reducing upfront costs to enable the purchase of ZEVs in place of fossil fuel-powered vehicles.
- **Offer fleet feasibility studies:** NYSERDA and the electric utilities should undertake feasibility studies for MHD fleets, including school districts and transit agencies, to identify benefits, costs,

logistical challenges, financing options, other barriers to electrification. By bearing these soft costs, the State should provide fleet managers with the financial information necessary to make the case for investment in zero-emission fleets.

- **Expand NY Green Bank’s mission:** The State should enable the NY Green Bank to take on different types of investment opportunities in defined categories of electrification financing, potentially including EV charging infrastructure as well as fleets.

T12. Market-Based Fuel Policy

The strategies described above will reduce the State’s reliance on fossil fuels for transportation as expeditiously as possible. Right now, the transportation fuels market is built principally around cost considerations and does not incorporate the Climate Act’s requirement for emission reductions for GHGs and dangerous co-pollutants. Aligning market incentives with the pressing need to decarbonize New York’s economy can unlock accelerated deployment of electric and zero-emission vehicles, as well as support alternative fuels in important and challenging-to-electrify use cases. A strategy that prioritizes electrification but enables existing vehicles to contribute to emission reductions via alternative fuel substitution offers a pathway for maximum reductions. Given the service life of current vehicles and equipment, liquid fuels are expected to constitute most of the fuel mix until the mid- or late-2030s under the most aggressive integration analysis scenarios identified for transitioning to zero-emission technologies. Substituting sustainable renewable fuels for a portion of the remaining fossil fuel combustion will reduce GHGs and other emissions.

For harder-to-electrify vehicles and equipment, the integration analysis scenarios identified for meeting the Climate Act GHG emission reduction requirements rely, in part, on the increased use of alternative fuels, including renewable diesel, renewable jet fuel, and/or green hydrogen. The CJWG opposes policies supporting renewable fuels on the grounds that they still release harmful air pollutants, particularly in areas overburdened with diesel emissions, and contends that the State should focus instead on expeditiously electrifying vehicles and the use of hydrogen fuel cells. Because this Scoping Plan expedites electrification as much as reasonably feasible, any GHG emission reductions from the use of renewable fuels would be in addition to the emission reductions from accelerated electrification and would not serve to slow the pace of electrification.

Components of the Strategy

- **Clean Transportation Standard:** DEC and NYSERDA should evaluate and consider adopting a variation on a clean fuel standard that would, as described in more detail below, support the

transition to electrification, expanded transit, and clean transportation alternatives, particularly in Disadvantaged Communities. A traditional clean fuel standard is a policy mechanism to facilitate decarbonization of transportation fuels by requiring fossil fuel providers to reduce the carbon content of the fuels they provide by either acquiring credits from providers of electricity for transportation use or other zero-carbon or lower-carbon fuels into the stream of commerce or by blending lower-carbon fuels into their fuel mixes. In New York, a variant of this policy, a “clean transportation standard,” would support transportation electrification as petroleum fuel providers finance the use of electricity for transportation use. **Other fuels may be eligible to generate credits through the program subject to screening based on co-pollutant emissions, as described below.** Electricity in New York is an increasingly low-carbon fuel as the State moves toward zero-emission electricity by 2040, as required by the Climate Act. A clean transportation standard should include consideration of how it might interact with other policy measures, especially economywide measures identified in this Scoping Plan. Based on benefit-cost analyses and interaction with other policies, DEC and NYSERDA should assess the viability, need for, and efficacy of the proposed clean transportation standard prior to commencing a regulatory process. This clean transportation standard design would improve on existing models via program design choices that align a standard with Climate Act goals and requirements. Any proposed standard should include the following elements:

- The program should be designed to ensure long-term electrification by instituting a long-term trajectory for carbon intensity reductions out through 2050, which would send clear price signals that indicate when combustion fuels would cease generating credits.
- The proposed clean transportation standard would also reward public transportation providers statewide for emission reductions from electrified transit, providing them with resources to accelerate zero-emission rolling stock and infrastructure, as well as improve service, particularly to underserved communities.
- The program could also offer public and nonprofit fleets “advance credits” upon purchase of ZEVs, reducing the upfront cost of these vehicles.
- To prioritize co-pollutant emission reductions in Disadvantaged Communities and benefit LMI households, the clean transportation standard should ensure that revenue generated from credits associated with home-charging of EVs is largely or wholly directed to electrification, improved transit, and other mobility alternatives to benefit Disadvantaged Communities and LMI households, with input from community representatives. One way to achieve this is by having the State generate these credits directly.

- To address the CJWG’s concerns, the clean transportation standard should also screen fuels based on their co-pollutant emissions, limiting credit generation to those fuels that, based on a rigorous analysis, including an analysis of peer-reviewed scientific research, and subject to public comment, have lower overall co-pollutant emissions than petroleum fuels.
 - Program design could consider ways to support electrification of offroad fuel uses, often a disproportionately impactful source of air pollutants, particularly in Disadvantaged Communities.
 - The policy could also be structured to allow aviation fuels to voluntarily opt into the program, reducing emissions in this challenging-to-electrify subsector.
 - Decisions regarding the carbon intensity of alternative fuels would provide market signals that promote the use of those fuels that have a lower fuel cycle carbon intensity on a life cycle basis.
- **Clean fuel infrastructure:** The State should fund incentives for infrastructure for cleaner fuels, such as green hydrogen, where additional market support is needed.