



NJ TRANSIT SUSTAINABILITY PLAN

2024



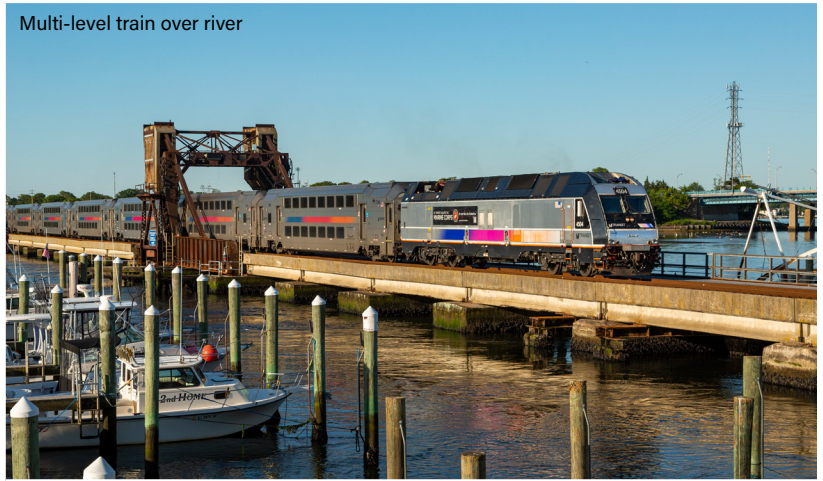


Electric buses

NJ TRANSIT Ambassador assists passengers at Secaucus Junction



Multi-level train over river



George Washington Bridge Bus Station

River Line



Access Link bus



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FOREWARD FROM OUR PRESIDENT



A handwritten signature in black ink, appearing to read "K. S. Corbett".

Kevin S. Corbett
NJ TRANSIT President & CEO

This Sustainability Plan memorializes our commitment to build and operate sustainably at NJ TRANSIT. It is our assurance to plan, monitor, and report on our progress toward meeting the environmental, social, and economic goals that matter most to our customers, stakeholders, and employees.

Sustainability has been a core part of the culture at NJ TRANSIT for many decades, and the desire to tackle the impacts of climate change and social inequality is stronger than ever. As the United Nations Intergovernmental Panel on Climate Change made clear in March 2023, we must increase our efforts in this decade to meet clean air goals. Governor Phil Murphy's accelerated target of 100% clean energy by 2035 reflects an understanding — ***what we do today will affect New Jersey and its residents for generations to come.*** We understand the urgency and intend to continue to do our part, and more.

I am proud to lead this organization of 12,000 employees who run the nation's largest statewide transit agency. Throughout the pandemic, we were hard at work keeping our essential workers moving while preparing near- and long-term plans that embed the environmental, social, and economic pillars of sustainability into our business planning and asset management. We advanced plans that enable dense energy-efficient development, support the decarbonization of the transportation sector, enhance our partnerships in innovative technology, and respond to the needs of our customers. We are well-positioned to deliver sustainable, resilient, and equitable transportation in the years to come.

This is our first Sustainability Plan, and it is centered on a framework that aligns with local, national, and global priorities. Throughout our planning process, we asked our employees, customers, and stakeholders to provide feedback on the threats and opportunities for delivering a sustainable transit system and a greener New Jersey. We listened, and now we commit to follow through. Guided by the Board Energy and Sustainability Policy Committee, we will continue to question how we impact the environment and the health and welfare of our communities. We will then seek to identify and implement the plans for continuous improvement.

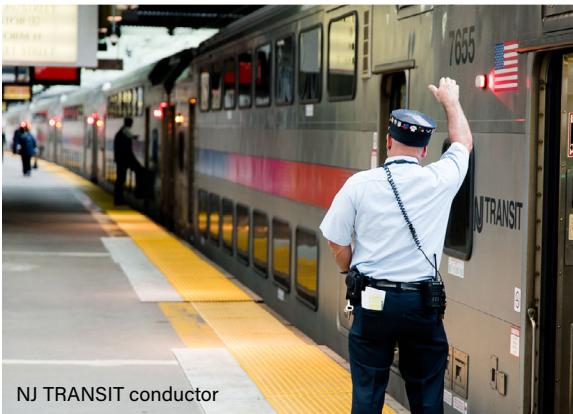




Bus with bike rack driving through Newark



NJ TRANSIT conductor assists a woman off the train



NJ TRANSIT conductor



Light rail train passes through Broad Street Station



American Public Transportation Association Award Meet & Greet at Ferry Street

INTRODUCTION

NJ TRANSIT is a key player in enhancing environmental quality and social equity for New Jersey's growing communities. This document, NJ TRANSIT's first Sustainability Plan, establishes the agency's commitment to develop policies and strategies that reflect best practices in sustainability and resilience for the transportation industry. This plan builds upon the vision of sustainability and resilience articulated in the NJT2030: 10-Year Strategic Plan (the Strategic Plan) and the NJ TRANSIT Five-Year Capital Plan (the Capital Plan). These plans are meant to work together. The Sustainability Plan describes what NJ TRANSIT could achieve through all stages of planning, design, construction, and operation of New Jersey's statewide transit system with a fully funded capital program and sustained, reliable operational funding.

In general terms, sustainability is the ability to meet the needs of today without compromising the needs of future generations. For NJ TRANSIT, sustainability is the ability to meet the demands of

existing and future transit customers by providing safe and reliable service, while supporting smart land use policies and prioritizing transit system modernization and expansion to prepare for a growing New Jersey population.

The State of New Jersey defines climate resilience as "the ability of social and ecological systems to absorb and adapt to shocks and stresses resulting from a changing climate, while becoming better positioned to respond in the future."¹ For NJ TRANSIT, resilience means:

- Enabling rapid recovery and restoration of service to maintain continuity in response to natural, cyber, and man-made hazards, and
- Ensuring the long-term functionality and preservation of agency infrastructure, facilities, and assets by mitigating future climate change impacts.

¹ See [State of NJ Climate Resilience Strategy](#), 2021, pg. 4.

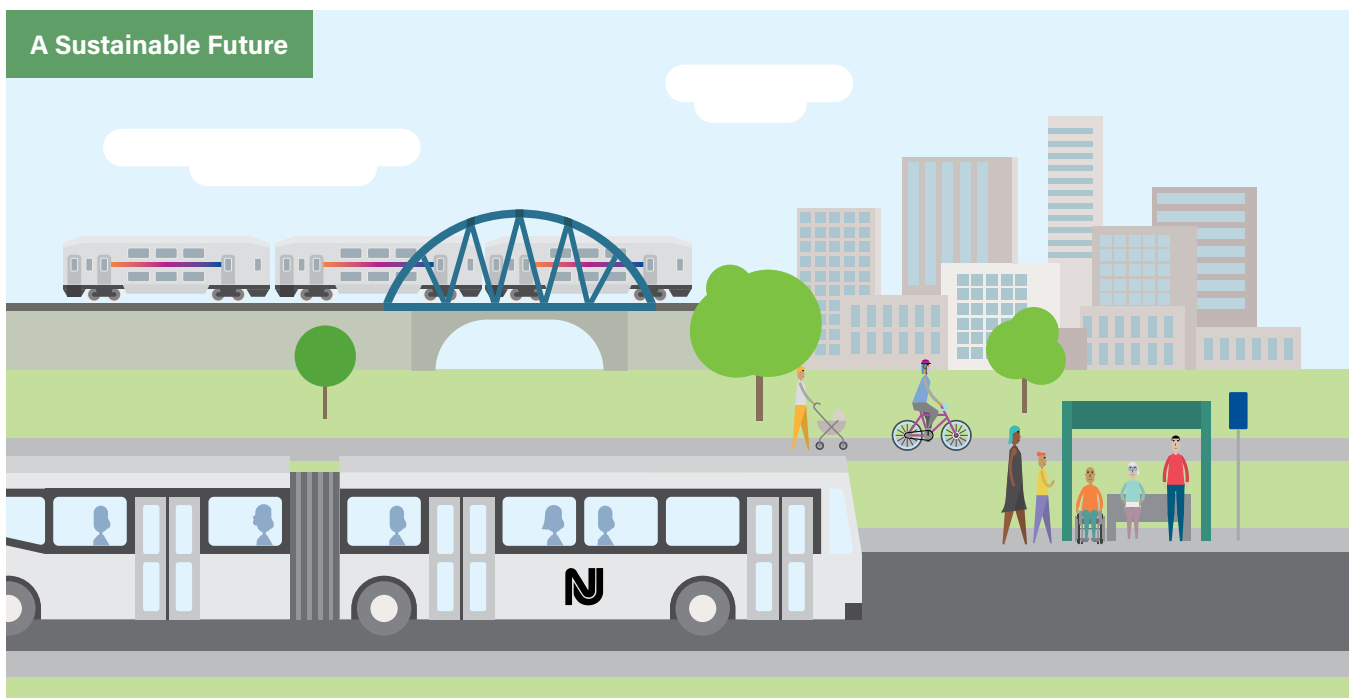


This document articulates NJ TRANSIT’s approach to building and operating a more sustainable and resilient transportation system. Through an outreach process conducted during the development of this Sustainability Plan, the agency gathered input from a wide variety of stakeholders, including NJ TRANSIT staff, external advocacy groups, and the public. During this process, stakeholders emphasized the importance of learning from the sustainability best practices of peer transit agencies. Examples from peer transit agencies emphasized the need for a data-driven decision-making process to advance NJ TRANSIT’s sustainable actions.

NJ TRANSIT has two functions: to deliver transit services (operations) and to build and maintain the infrastructure upon which those services rely (capital investment). This document explores both operational and capital investment interventions to improve, sustain, and expand New Jersey’s public transportation network. The Sustainability Plan highlights NJ TRANSIT’s past and current efforts to make the agency, and the services it provides,

more sustainable and resilient. This document also identifies opportunities for the agency to accelerate a more sustainable future by advancing transit projects and programs. The sections of the plan that follow describe:

- ✓ The **importance of public transportation** in creating a more sustainable and resilient future for New Jersey, and attaining statewide environmental and energy goals;
- ✓ **Capital investments** (funded and unfunded), and operational and management strategies which reduce NJ TRANSIT’s carbon footprint;
- ✓ NJ TRANSIT’s **resilience efforts to combat climate change** and ensure robust emergency response; and
- ✓ **Aspirations of NJ TRANSIT**, as well as the challenges facing the agency in meeting the sustainability and resilience goals set forth in this document.



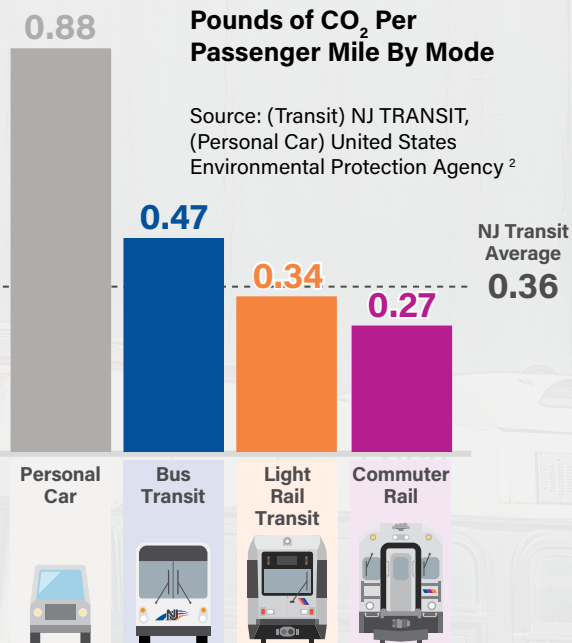
NJ TRANSIT IS KEY TO NEW JERSEY'S SUSTAINABLE FUTURE

Public transportation, or transit, is inherently good for public health and the environment. Transit service reduces harmful air emissions by encouraging people to use energy-efficient travel options like train, bus, or light rail service and reduces reliance on private automobiles.

In 2019 alone, NJ TRANSIT services offset personal vehicle use by more than 1.5 billion miles, displacing 3.9 million metric tons of carbon dioxide equivalent emissions.

Fewer cars on the road also results in reduced rates of car crashes and injuries, reduced congestion, cleaner air, and

a smaller carbon footprint for New Jersey. As the provider of transit service for the state of New Jersey, NJ TRANSIT has a key role to play in realizing the state's larger sustainability goals articulated in New Jersey's Energy Master Plan (2019) and Global Warming Response Act Report (2020).



Communities with robust transit service are safer and healthier than communities that only rely on cars for transportation. Public transportation is one of the safest mobility options. There were 134 times more fatalities on highways than on transit in the United States in 2020.³ Public transportation investment and supportive policies increase traffic safety by reducing crash risk for travelers who shift from automobile to transit and reducing community-wide crashes due to fewer total vehicle miles traveled (VMT). Design guidelines for transit-oriented development encourage traffic calming measures and reduced speed limits that support safe routes to transit. The American Public Transportation Association (APTA) reports that transit-oriented communities are five times safer with about a fifth the per capita traffic casualty rate (fatalities and injuries) compared to automobile-oriented communities. Public transit investment cuts a community's crash risk in half even for those who do not use transit.⁴

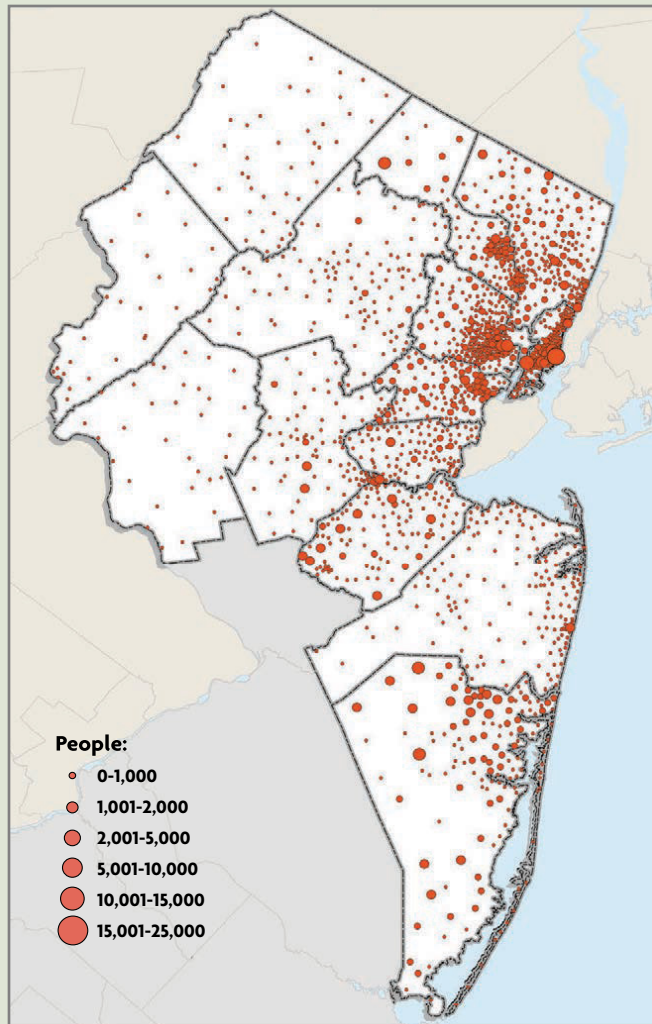
Public transportation also plays a critical role in New Jersey's ability to respond to an emergency. During the COVID-19 pandemic, NJ TRANSIT responded immediately and in real-time—communicating safety protocols for staff and riders and altering services to help essential workers and transit-reliant customers get to hospitals, pharmacies, distribution centers, and grocery stores.

² See [Greenhouse Gas Emissions from a Typical Passenger Vehicle](#).

³ See [APTA-2022-Public-Transportation-Fact-Book.pdf](#), accessed December 6, 2023.

⁴ See [The Hidden Traffic Safety Solution: Public Transportation \(apta.com\)](#), accessed December 7, 2023.

⁵ See 2050 forecasts prepared by the [North Jersey Metropolitan Transportation Authority \(NJTPA\)](#), [South Jersey Transportation Planning Organization \(SJTPO\)](#), and [Delaware Valley Regional Planning Commission \(DVRPC\)](#) (found in Appendix D), accessed January 15, 2023. Note that the forecasts predate the COVID-19 pandemic, however, the plan assumes the region will largely recover to pre-pandemic growth levels after a five- to 10-year setback.

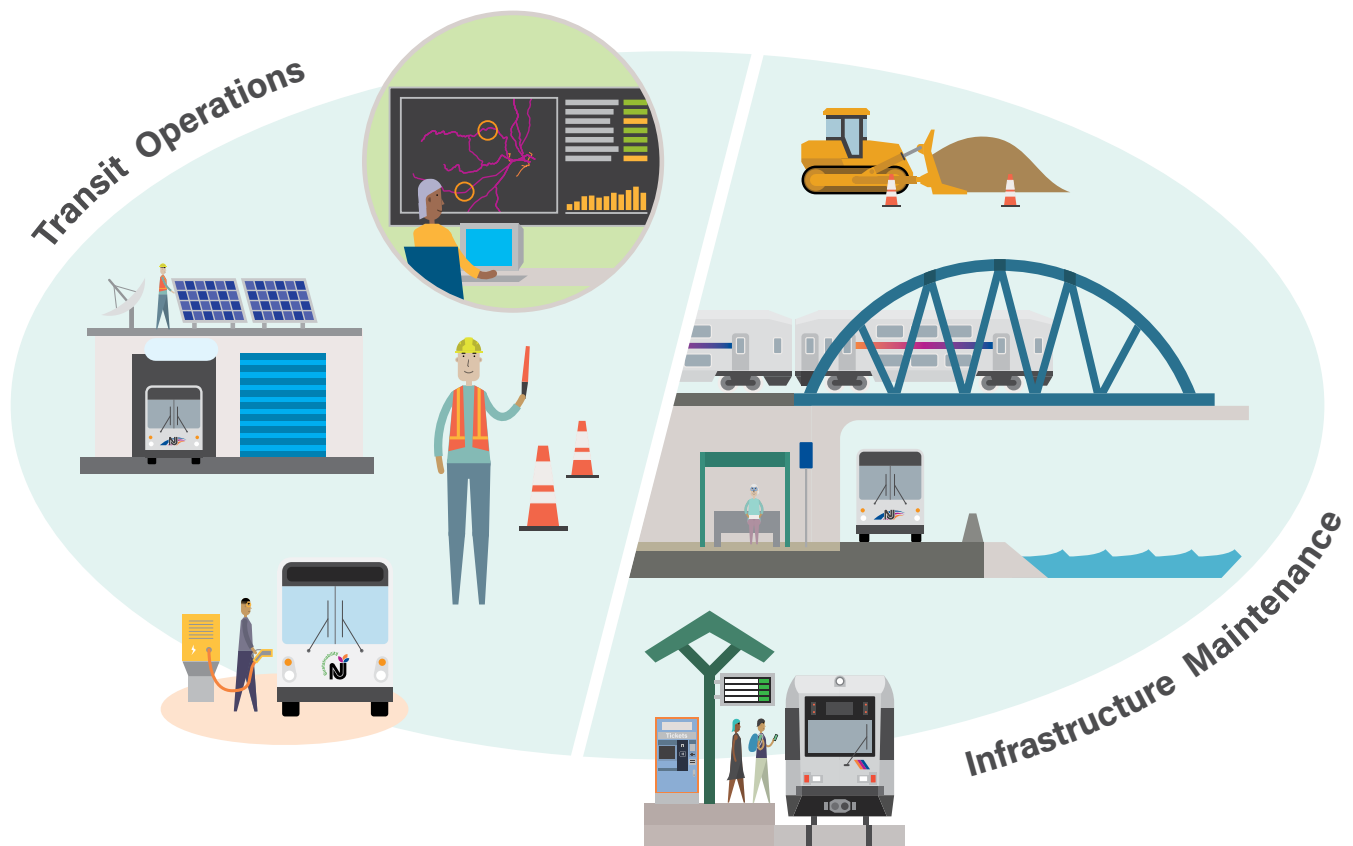


Population Growth Forecast 2015-2050

Source: NJTPA, 2016; Esri, 2017⁵

New Jersey's population is expected to continue to grow, with more than a million new residents projected by 2050⁵. To capture this growth sustainably, NJ TRANSIT must not only modernize equipment, but also expand services into key growth corridors. NJ TRANSIT has made great strides in improving reliability and customer satisfaction over the last few years. However, additional funding will be needed to design and construct the capacity expansion projects that are prioritized in the Capital Plan. Increased financial support would enable NJ TRANSIT to meet future transportation demand as businesses and communities grow.

SUSTAINABLE STRATEGIES, INITIATIVES, AND INVESTMENTS



DEFINING SUSTAINABILITY FOR NJ TRANSIT

A sustainable transit service can meet the transportation needs of current and future transit customers. To accomplish this, NJ TRANSIT must perform two simultaneous functions:

- Provide safe, reliable, and convenient transit service in the present day, and
- Maintain and expand the network of infrastructure upon which transit service relies.

This section of the Sustainability Plan describes the much-needed capital investments that would modernize and expand the NJ TRANSIT network as well as strategies and initiatives that promote the agency's operational efficiency over time.

CAPITAL INVESTMENTS FOR SUSTAINABILITY

The Capital Plan is a comprehensive list of investments that addresses NJ TRANSIT's current and future infrastructure and fleet needs. It includes critical investments in the transit network that need to begin within the next 5 years and provides a road map for future investments that NJ TRANSIT has identified over the next 20 years. However, projects are only advanced as funding becomes available. Projects that address health and safety, modernization of facilities and infrastructure (state-of-good repair), service reliability, and accessibility are given high priority.

A fundamental strategy that NJ TRANSIT implements to advance sustainability is the prioritization of modernization and state-of-good repair projects for transit infrastructure. "State-of-good repair" is the condition in which an asset can operate at its optimal level of performance. Assets such as track signals, bridges, stations, and bus garages that are in poor condition present safety risks, lead to unreliable service, operate inefficiently, waste environmental resources, and have high maintenance costs. Through the Facility Inspection Program, NJ TRANSIT inspects all passenger, maintenance, and administrative facilities to identify assets that are in poor or marginal condition and address any existing risks.

By modernizing assets with the best available technology rather than replacing assets in kind, NJ TRANSIT can ensure efficiency, resilience, and longevity of its systems. In the Capital Plan, \$10.9 billion in modernization projects have been obligated or assigned funding. NJ TRANSIT has also identified an additional \$2.45 billion in investments currently unfunded but recognized as critical to improve system reliability by reducing equipment breakdowns, infrastructure failures, and service interruptions. Reliable data and information are foundational to managing all assets; the agency is in the process of identifying the best strategy to consolidate asset data and information into an enterprise system.

While all transit improvements and expansions make the system more attractive and efficient, NJ TRANSIT actively identifies and prioritizes investments in the Capital Plan that also improve the transit system's impact on community sustainability. The agency is actively engaging with partners at the Federal level to prepare for climate change risks and prioritize support to historically disadvantaged communities, advance environmental justice, and promote affordable access to transportation. Funding opportunities are expected to be made available to transit agencies which focus on disadvantaged communities, funding for clean infrastructure research and development, and workforce development and training.



Electric buses parked at Newton Avenue Bus Garage

Investments that Reduce GHG Emissions, Energy Use, and Air Pollution

NJ TRANSIT is advancing several projects to meet the state's accelerated goal of 100 percent clean energy by 2035. For example, the introduction of zero emissions buses (ZEBs), along with charging and maintenance infrastructure, will enable NJ TRANSIT's fleet of over 3,300 buses to meet the established statute for fleet purchases to be 100 percent ZEBs by 2032. Ongoing initiatives include:



Zero Emission Bus Transition Program

NJ TRANSIT deployments of battery electric buses in Camden and Newark are providing historically marginalized communities with cleaner public transportation options and improved local air quality. Clean buses in combination with inclusive and equitable redesigns of the bus network in cities like Newark and Camden demonstrate NJ TRANSIT's commitment to transportation equity. NJ TRANSIT is also making investments to prioritize bus service in key travel corridors, by deploying software innovations that lead to better bus dispatching and traffic signal timing controls to reduce trip times and improve service reliability.



Additional ZEB Infrastructure

In 2022, NJ TRANSIT advanced \$360 million in bus and facility grants through Low or No Emissions Buses and Bus Facilities federal grant opportunities for:

- Building an all-electric 40-bus facility at a currently unused NJ TRANSIT property in Union City;
- Modernizing Hilton Bus Garage to be ready for ZEBs. This project includes building a solar canopy and making critical state-of-good repair improvements to the facility;
- Building a Battery Electric Bus (BEB) charging and storage facility with a solar canopy at Greenville's auxiliary parking lot, which will allow for the deployment of up to 24 BEBs; and
- Implementing the initial phase of a BEB depot at the Meadowlands Bus garage to support the deployment of articulated BEBs.

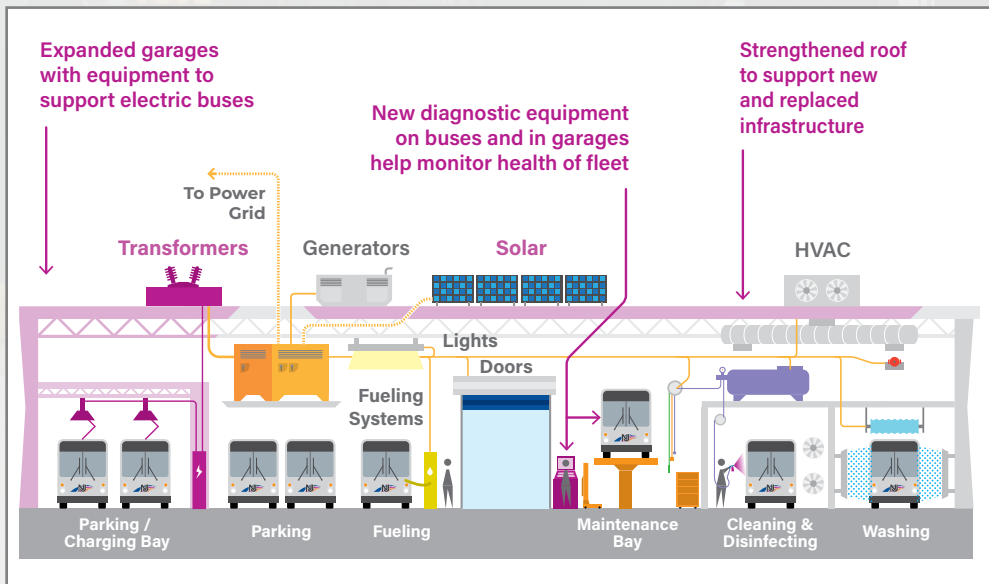


Bus Garage Modernization Program

The Bus Garage Modernization Program will install zero emission bus infrastructure and equipment in existing garages so that they can house and maintain the ZEB fleet. Modernization of the bus garages will support the decarbonization of the transportation sector, improve regional air quality, and include rooftop solar panels where possible. Working in parallel with modernization of the bus garages, comprehensive planning for the fleet transition to ZEB is underway. NJ TRANSIT is currently conducting the Zero Emission Bus System Design and Investment Planning Study to establish practices, standards, and specifications based on global best practices for the new electric fleet and bus network. Garage transition plans and investment plans needed to achieve a ZEB fleet will be outlined in the study. This study is scheduled to be complete by 2025.



Parked zero emissions buses





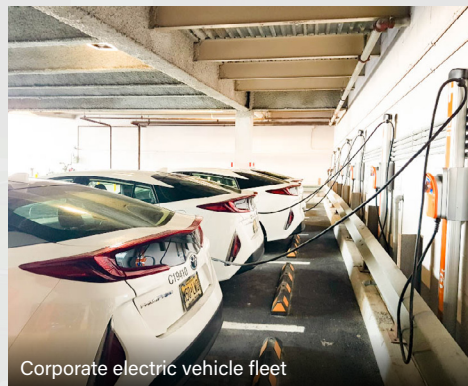
Northern Bus Maintenance Facility

A new bus maintenance and storage facility will be built in the Village of Ridgefield Park, New Jersey. The purpose of the project is to address NJ TRANSIT's existing bus maintenance and capacity shortfall and accommodate the electric bus purchases that are stipulated in New Jersey's Electric Vehicle Legislation. The new facility will accommodate the bus fleet from existing garages as they are taken out of service for modernization. This will prevent service interruptions during modernization.



NJ TRANSIT Corporate Hybrid Electric Fleet

As of the end of 2023, NJ TRANSIT had a total corporate fleet of over 97 non-revenue hybrid-electric and electric vehicles and 43 charging stations at five locations. NJ TRANSIT will continue to expand its fleet and is actively installing chargers at more locations across the state.



Corporate electric vehicle fleet



Battery Electric Locomotives

NJ TRANSIT trains are powered via electrified overhead catenary wires or, in non-electrified territory, diesel fuel-powered engines. Diesel engines are less efficient in providing power to trains and increase carbon emissions compared to electric power. For portions of the rail system that do not support catenary wires, NJ TRANSIT is studying how to convert a Dual Power Diesel-Electric locomotive into one that can be propelled by electrical energy stored in a high-capacity battery, also known as a battery electric locomotive. Computer-based simulations of real-world operating scenarios are underway examining vehicle parameters, passenger loading, route characteristics, and station stops on the North Jersey Coast Line and the Montclair-Boonton Line.

Investments that Enhance Accessibility and Customer Experience

As described in the Strategic Plan, NJ TRANSIT is deploying several strategies to achieve its goal of delivering a high-quality experience for all customers, with their entire journey in mind. Customer satisfaction and trust are critical to attracting and retaining transit system riders and ultimately offsetting emissions generated from private vehicle trips. A good customer experience leads to frequent and dependable ridership that can grow over time, reducing the total amount of GHG emissions generated and slowing the effects of climate change.

NJ TRANSIT conducts biannual customer satisfaction surveys that support the prioritization of customer experience strategies. The cost, comfort, and convenience of transit are the key factors that influence customer satisfaction and affect the degree to which public transit is competitive with the automobile. To ensure that customers receive consistent, accurate communication across all channels, NJ TRANSIT operates a unified communications center that places communications staff side-by-side with social media representatives, ensuring open communication to improve the timeliness and accuracy of customer communications. This unified communications center, staffed on a 24/7/365 basis, ensures that when disruptions occur, customers are provided with the information they need, including alternate modes of travel, as soon as possible.

As an example of NJ TRANSIT's highly developed approach, NJ TRANSIT has partnered with Magnusmode for the development of a free mobile app to help customers with disabilities travel around the system as safely and efficiently as possible. The MagnusCard combines the instruction of an autism educational specialist with real-world images that aid neurodiverse customers and others who may need extra guidance to navigate everyday travel experiences.

NJ TRANSIT continues to improve the customer experience at stops and stations, with several projects listed in the Capital Plan. Several projects have been recently funded, as described in the following pages.



Newark Penn Station Modernization

Newark Penn Station Modernization provides for the restoration of the busiest New Jersey train station on the Northeast Corridor. The restoration includes improvements to circulation, functionality, and visual aesthetics in close coordination with the City of Newark and surrounding communities. Construction is in progress to restore key components of the historic waiting room. Plans are being accelerated for near-term site circulation and landscaping improvements to the north and south grounds. A design team is currently underway to develop a new station master plan.



Newark Penn Station



Lackawanna Cut-Off Project

Planning and design of a new Andover Station represents the first phase of the Lackawanna Cut-Off Project. This portion of the project will extend from Port Morris, NJ to Andover, NJ. This station presents an opportunity to design a new standard that incorporates sustainable elements, such as rain gardens with native plants and swale and stone filtration for stormwater management and runoff pollution control.



River Line at Walter Rand Transportation Center



Walter Rand Transportation Center Redevelopment

The Walter Rand Transportation Center Redevelopment will convert the existing intermodal facility into an expanded, multi-purpose transportation center, providing improved transit connections for residents of Camden, the surrounding South Jersey region, and Philadelphia. The new transportation center will better accommodate the bus lines that serve the facility and provide improved intermodal connectivity with the PATCO Speedline and the River LINE. The improved design also aims to provide additional parking, administrative offices, and retail opportunities adjacent to a growing educational and healthcare corridor. The project will enable the introduction of more ZEBs into South Jersey.

Other Station Improvement projects are identified in the Capital Plan and will progress as funding becomes available.

Investments that Expand Transit Capacity

The Capital Plan includes several projects that would provide additional passenger capacity. These include:



Hudson County Long Slip Canal construction



Hudson-Bergen Light Rail (HBLR) Northern Branch

Hudson-Bergen Light Rail (HBLR) Northern Branch is an expansion of the HBLR from its current northern terminus at Tonelle Avenue in Hudson County to eastern Bergen County. The extension would stretch nine miles to the north, creating seven new stations along its route. The project is partially funded through the planning and design phases.



HBLR Route 440 Extension

HBLR Route 440 Extension is an expansion of the West Side Avenue line bringing light rail service to the west of State Route 440 and the developing western waterfront area of Jersey City. The project is in its final design stages and additional funds are required for construction.



Secaucus to Meadowlands Transitway and Greenway

Secaucus to Meadowlands Transitway and Greenway would increase transit capacity from Secaucus Junction to the Meadowlands Sports Complex by supplementing rail service with bus rapid transit while incorporating a linear park or "greenway" along the historic Boonton Line, a 9-mile right-of-way that was acquired by New Jersey Department of Environmental Protection (NJDEP) from Norfolk Southern in 2022. The project is partially funded and the transitway is in the preliminary engineering phase.



Parked Access Link buses

OPERATIONAL PRACTICES THAT PROMOTE SUSTAINABILITY

The day-to-day operations of NJ TRANSIT include maintenance of the infrastructure needed to operate service (e.g., tracks, stations, viaducts, shops, yards, and railroad right-of-way) and maintenance of rolling stock (e.g., buses, locomotives, train cars, and vans). NJ TRANSIT operates 18 bus maintenance facilities and 22 rail shops and yards that maintain more than 2,300 buses, 72 Light Rail cars and 1,200 rail cars⁶. Transit operations involve sophisticated communication and signaling systems for the safety of the traveling public as well as efficient operation of train, bus, and light rail service.

NJ TRANSIT operates and maintains its facilities and vehicles, and procures products and services in compliance with state and federal laws and regulations developed to protect human health and the environment. New Jersey's environmental

regulations are some of the most stringent in the nation, addressing water pollution control, hazardous materials, air quality emissions, waste management, noise and vibration control, historic resources, and the protection of biological and ecological resources.

NJ TRANSIT's environmental compliance staff coordinates with each operating department to improve compliance protocols and practices within the financial constraints of each annual budget. Environmental sustainability practices are well integrated into NJ TRANSIT's daily operations as demonstrated by an unblemished environmental compliance record. NJ TRANSIT continues to advance sustainability in every aspect of its operations, as described below.

⁶ See [NJ TRANSIT Facts at a Glance](#)



Resource Conservation



Recycling bin at train station

NJ TRANSIT complies with the New Jersey Statewide Mandatory Source Separation and Recycling Act, which allows for dual stream recycling and single stream recycling collection systems at each rail and bus station. In addition, NJ TRANSIT recycles batteries, scrap metal, used oil, wooden railroad ties, and other materials at its shops and yards to reduce waste to landfills.

To conserve water, NJ TRANSIT's bus washing system for the Wayne Garage was designed to maximize recycling and reuse of water, thereby minimizing water consumption and sewer discharge volume. Water from the washing operation is discharged sequentially through an underground sand interceptor and oil/water separator and recycled back to the bus wash for reuse via the onsite wastewater pretreatment plant. The design for the new Northern Bus Facility includes a rainwater harvesting system from facility roofs to be used for bus washing and to reduce quantity runoff and demand on the potable water supply.

To conserve fuel and promote clean air, all NJ TRANSIT buses are equipped with a timer that shuts off the engine after three minutes of idling.

NJ TRANSIT design guidelines call for sustainable materials and resources to be used in construction and for the agency to consider cost-effective resource conservation elements in project design. Going forward we plan to integrate priority energy efficiency measures and sustainable design guidelines into design standards and capital planning processes.



Energy Efficiency

NJ TRANSIT participates in the Local Government Energy Audit offered by New Jersey's Clean Energy Program to identify energy-efficient cost savings, reduce operating expenses, and improve the health and productivity of building occupants. As part of the capital improvement plan, NJ TRANSIT implements energy efficiency upgrades, including LED lighting and modern HVAC equipment.



Cherry Hill Station solar bus shelter

NJ TRANSIT is investigating the use of a solar photovoltaic (PV) Power Purchase Agreement to advance distributed energy resources, offsetting onsite electricity use and promoting environmental stewardship and resilience.

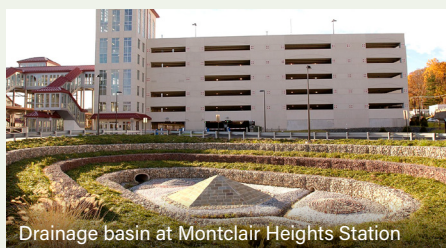
The agency has completed a feasibility study and solicited bids from qualified vendors for the installation of a solar photovoltaic canopy at the Egg Harbor Bus Garage and is developing specifications and drawings of solar-ready rooftop and ground-mount canopy designs for bus stations. These initiatives will supplement the existing 520 kW rooftop solar panel installation at the Meadowlands Maintenance Complex (MMC) and the planned 2.5 MW solar panel installation planned for the rooftop of the Northern Bus Facility.



Pollution Control

NJ TRANSIT's Air Compliance unit ensures that the emissions from fossil fuel burning units, such as boilers, heaters, and emergency generators, which are utilized in bus garages and rail facilities, are minimized through compliance with the air regulations set forth by the United States Environmental Protection Agency (USEPA) and NJDEP, in accordance with the Clean Air Act.

The Wastewater Compliance Program ensures that wastewater from industrial activities (such as facility cleaning, vehicle washing, and repairs) is pretreated to meet standards before discharging to the local municipal utility authorities. The Wastewater Compliance Program encompasses periodic wastewater sampling from regulated facilities, reporting to regulatory agencies, cleaning and maintenance of wastewater treatment systems and equipment.



Drainage basin at Montclair Heights Station

NJ TRANSIT's Stormwater Compliance Program minimizes pollutants in stormwater runoff, reduces soil erosion and flood damage, protects public safety, and safeguards aquatic life. Staff conduct stormwater sampling and reporting, prepare and submit all permit applications and renewals, and conduct self-inspections at facilities to ensure that stormwater management best practices are in place.



Technical Assistance to Communities

The need for smart growth policies to sustainably accommodate New Jersey's growing population was recognized four decades ago with the passage of the State Planning Act in 1985. In response, the "New Jersey State Development and Redevelopment Plan"⁷ calls for the revitalization of existing communities and the development of new communities in compact forms such that environmentally sensitive areas, rural landscapes, and farmland can be preserved. It recognizes that investment in public transportation is the best way to reduce consumption of land, vehicle miles traveled (VMT), and the overall consumption of energy resources, while increasing the efficiency of New Jersey's transportation infrastructure. These policies led to the creation of the Transit Village Initiative, spearheaded by the New Jersey Department of Transportation (NJDOT) and NJ TRANSIT, which creates incentives for municipalities to redevelop areas around transit stations using transit-oriented development (TOD) design standards. To date, NJ TRANSIT has provided technical assistance via the Transit Village program to more than 40 New Jersey communities and collaborated on more than 70 local, transit-friendly vision plans for NJ TRANSIT station areas throughout the state.



Bicycles parked at Bay Head Station

NJ TRANSIT administers technical assistance to New Jersey's Transportation Management Associations that coordinate commuter vanpools, provide oversight of bike lockers at transit stations, and develop partnerships with transportation networking companies like Uber and Lyft. The program, Rider's Choice, is now offered in 14 of New Jersey's 21 counties. NJ TRANSIT also provides technical assistance and guidance on transitioning to electric fleets for local agencies and non-profits that serve the elderly and individuals with disabilities. In November 2023, the Board of Directors approved the purchase of 19 federally funded, battery electric vans for local and community-based transportation programs. A portion of the vans will be distributed to community-based services in Essex, Middlesex, and Somerset counties as well as NJ TRANSIT's Access Link service. NJ TRANSIT will utilize eight of the vans for a future pilot program of an on-demand microtransit shuttle service along the Route 9 corridor in Monmouth County. These programs help to bridge the first/last mile gap and attract and retain ridership with minimal budgetary impacts for the agencies involved.



Customer boarding Access Link

⁷ See [New Jersey State Plan \(nj.gov\)](https://www.nj.gov/planning/plan2013-2021/), accessed January 7, 2023



Autism acceptance event

PARTNERSHIPS WITH RESEARCH AND PEER AGENCIES

NJ TRANSIT, in partnership with the International Association of Public Transport (UITP) and Rutgers University, recently launched the UITP North American Regional Training Center. UITP is the worldwide leader in sustainable public transportation and is dedicated to promoting public transportation's sustainable urban mobility. Based in Brussels, Belgium, UITP provides access to the best industry practices around

the globe, while training the next generation of transportation professionals on the challenges of the 21st century. Through this partnership, NJ TRANSIT will continue to evaluate innovative technologies and best practices to improve upon sustainable operations and management while fostering the collaborative innovation at the North American Regional Training Center.



Working with Rutgers University Center for Advanced Infrastructure and Transportation (CAIT) students

RESILIENT STRATEGIES, INITIATIVES, AND INVESTMENTS

DEFINING RESILIENCE FOR NJ TRANSIT

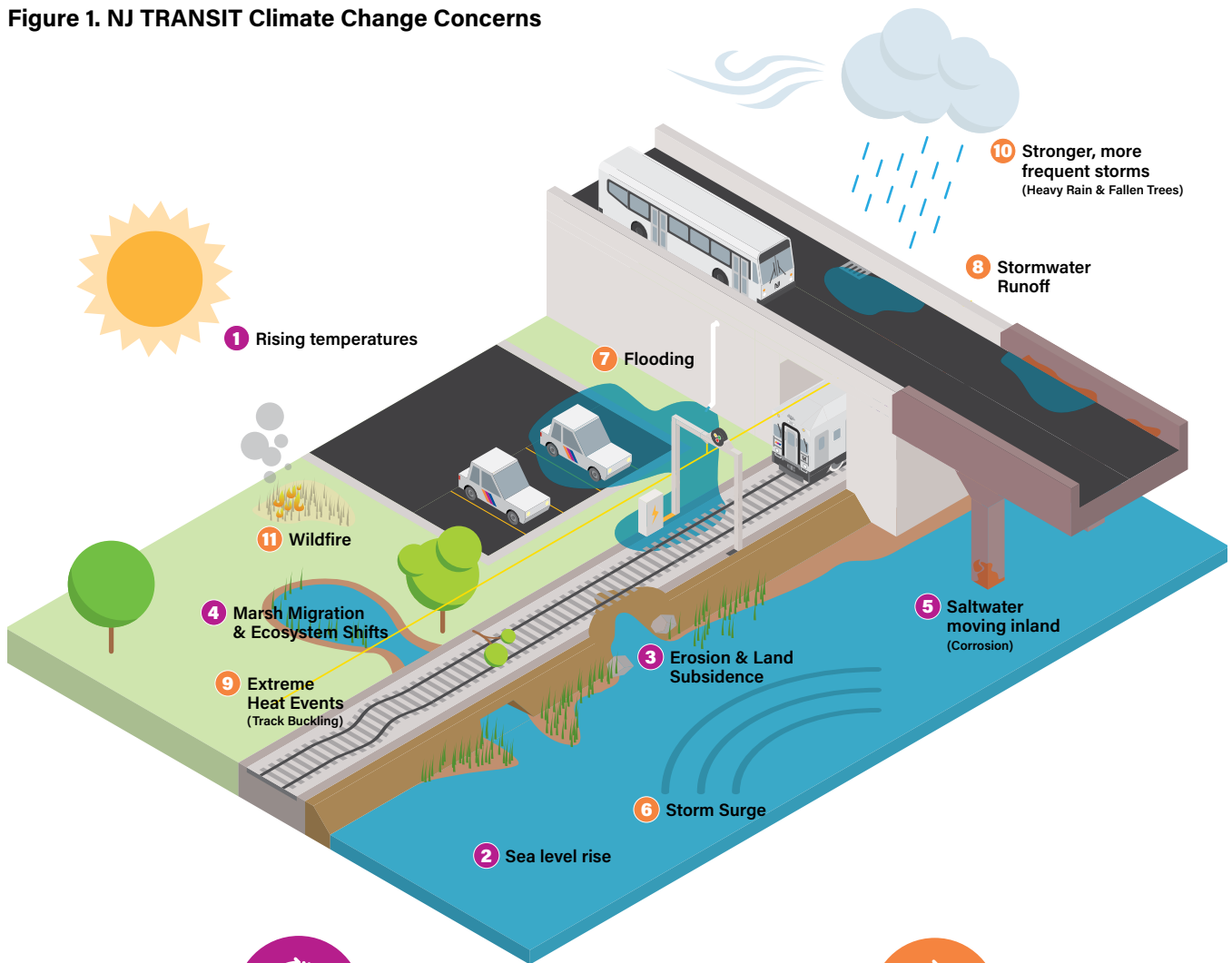
The State of New Jersey is vulnerable to several threats associated with climate change within the coming decades (Figure 1). Both gradual and intermittent events will disrupt daily life across the Tri-State area, and NJ TRANSIT is not immune. As climate change intensifies extreme weather events and permanently alters the physical environment, NJ TRANSIT will feel the strain more frequently and intensely, undermining its ability to provide safe, reliable public transit and emergency support functions.

For example, much of New Jersey's existing rail infrastructure and rights-of-way are located adjacent to waterways or in low-lying areas. The siting of these facilities was selected for the operational needs of the mid-1800's; today, however, climate change regularly endangers these properties. Four of NJ TRANSIT's commuter rail lines and one light rail line are already vulnerable to both storm surge and inland flooding due to their positions within coastal and inland floodplains. Due to their location, storms could inundate the track-bed and damage signal, power, and communications systems that are critical to safe operations. Several critical facilities, including the Meadowlands Maintenance Complex and Hoboken Terminal and Yard, are in coastal floodplains near dense urbanized areas.

NJ TRANSIT's experience during Superstorm Sandy, and its subsequent recovery, exposed vulnerabilities in the agency's regional transportation network and operations. Following the storm, NJ TRANSIT implemented multiple, long-term redesign and construction projects to harden and floodproof critical infrastructure. The agency also integrated climate resilience into new projects by raising infrastructure above flood risk elevation, utilizing materials that can withstand storm surge, and incorporating innovation and best practices into the long-term recovery process. NJ TRANSIT also invested in policy-based solutions (see Section 4.2) to enhance emergency response to natural hazards. These actions have allowed the system to better withstand, and recover from, extreme weather events.

Despite lessons learned from Sandy, extreme weather events are unpredictable and never resemble previous storms exactly. In the years since Sandy, several named storms and multiple flash flood events have wreaked havoc on NJ TRANSIT's system, with impacts varying based on the nature of the storm. As more frequent and severe weather events increase, an all-hazards approach to transportation resilience has become a high priority.

Figure 1. NJ TRANSIT Climate Change Concerns



Gradual Processes

- 1 Rising Temperatures
- 2 Sea Level Rise
- 3 Erosion & Land Subsidence
- 4 Marsh Migration & Ecosystem Shifts
- 5 Saltwater Moving Inland



Intermittent Events

- 6 Storm Surge
- 7 Flooding
- 8 Stormwater Runoff
- 9 Extreme Heat Events
- 10 Stronger, More Frequent Storms
- 11 Wildfire

OPERATIONAL PRACTICES THAT PROMOTE RESILIENCE

NJ TRANSIT's experience during Superstorm Sandy and its aftermath demonstrated the importance of ensuring the following: that operating units are prepared for a natural disaster; hazard mitigation activities are coordinated across all operating units; appropriate redundancies and power supplies are in place prior to an event; resources are allocated to operating units as efficiently as possible; and responsible parties understand their role during an emergency.

NJ TRANSIT's Office of Emergency Management (NJTOEM) leads the agency's efforts to coordinate, build, sustain, and improve NJ TRANSIT's ability to mitigate, prepare for, respond to, and recover from natural and man-made disasters. NJTOEM leads an "all-hazards"

approach to manage and coordinate emergency operations in concert with local, state, and federal governmental and private sector agencies.

To ensure adequate preparation, NJ TRANSIT maintains an annually updated Comprehensive Emergency Management Plan (CEMP), which establishes a comprehensive framework for the management of natural, technological, or human-caused incidents or events. The document sets forth an all-hazards approach to emergency management that integrates NJ TRANSIT's emergency plans and procedures to enhance cooperation and coordination among all operational groups during an incident. The plan provides general policies and standard operating procedures for NJ TRANSIT's operating groups and

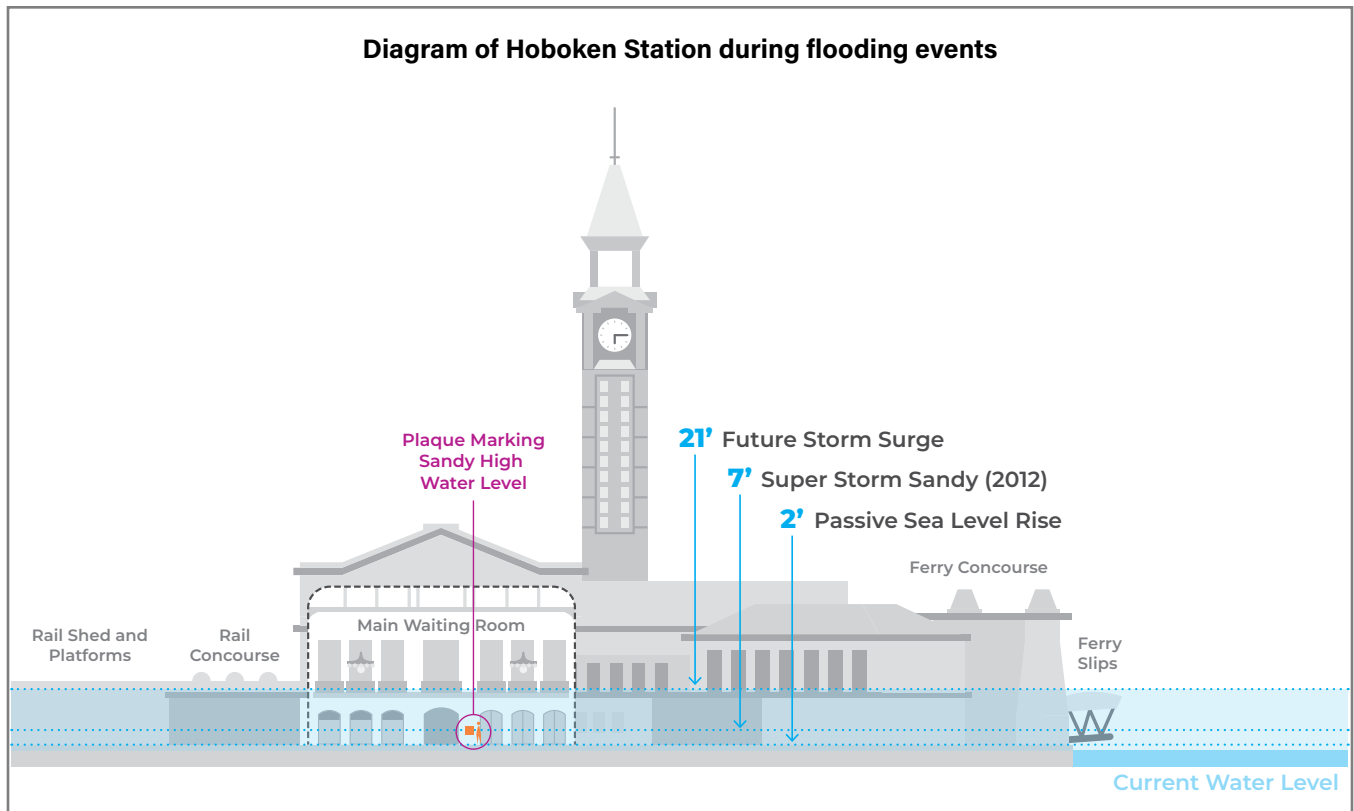


Flooding in Hoboken

departments to protect public safety, reduce damage to property, and avoid and limit economic disruption before, during, and after an event.

NJ TRANSIT's new permanent Emergency Operations Center (EOC), opened in 2017, serves as the coordination point for all operational business lines during both planned and unplanned events, including extreme weather events. The EOC is staffed with the personnel that facilitate emergency management policy decisions, and the center remains operational 24 hours a day, seven days per week during an extreme event. The new facility and technologies integrated into the EOC allow personnel to communicate with incident command and operating units, as well as coordinate with external agencies and stakeholders to support emergency response during an event.

NJ TRANSIT also leverages innovative technologies to understand how critical facilities will be impacted by storm events and various natural hazards. In partnership with the Rutgers Center for the Advancement of Infrastructure and Transportation (CAIT), NJ TRANSIT's Storm Surge Early Warning System for Hoboken Terminal predicts how the terminal will flood under anticipated storm scenarios. When a storm or heavy rain is forecasted, this tool provides on-demand flood simulations with multiple contingencies to show how storm surge from the Hudson River will affect the terminal and yard. This tool helps NJT-OEM, rail operations, and the terminal facility managers determine when to implement storm preparation measures like raising of rail switches or evacuation of terminal areas to mitigate storm damage.



CAPITAL INVESTMENTS FOR RESILIENCE

Investment in capital projects that protect vulnerable infrastructure is a critical part of NJ TRANSIT's climate resilience strategy. Since 2012, NJ TRANSIT has initiated several capital investment projects to protect critical assets.



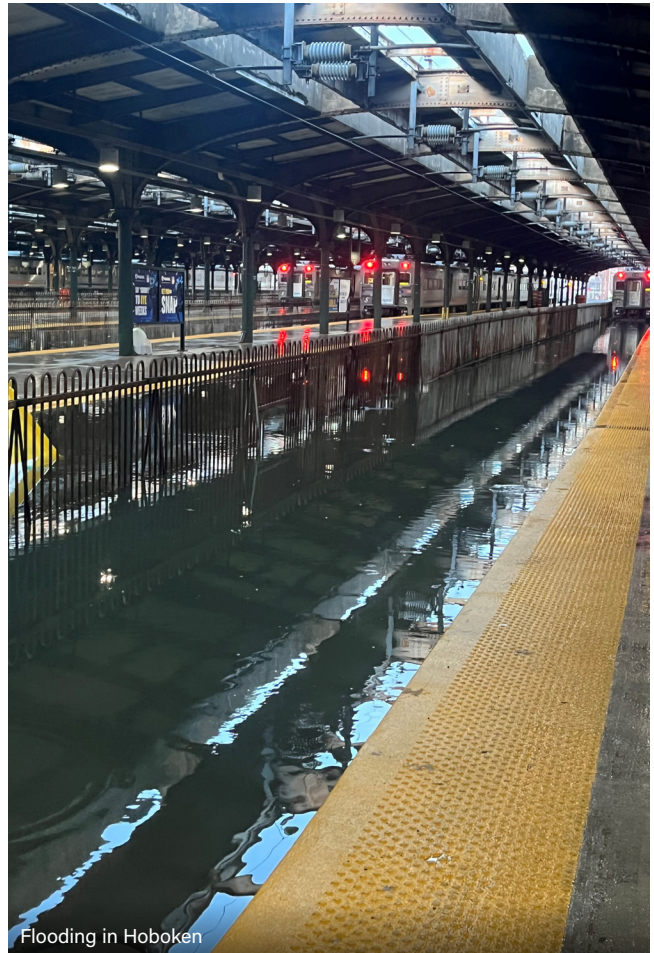
Following Superstorm Sandy, NJ TRANSIT completed several hardening projects to protect critical assets and facilities. A new floodwall was built at the Meadowlands Maintenance Complex; many signals and power systems were repaired and relocated above design flood elevation; train controls and communication systems were hardened; and Long Slip Canal was filled. These improvements will continue to protect rail, light rail, and bus infrastructure during extreme weather events, prevent the loss and damage of equipment, and ensure continuity of service.



Ongoing flood mitigation projects, such as the Delco Lead Storage and Inspection Facility and the Raritan River Drawbridge replacement, will mitigate flood risks and allow for continuity of operations following extreme storm events. These infrastructure projects will also enable the long-term functionality of NJ TRANSIT's service and infrastructure as climate conditions change over time.



NJ TRANSIT's Hoboken Terminal Program implemented multiple hardening measures at Hoboken Terminal and Yard to protect its various buildings and functions long-term. The Program's ongoing and future capital resilience investments will enhance and support the Terminal's role as a vital multi-modal connection for Manhattan-bound commuters for years to come.



Building climate resilience is a continuous process, as climate change impacts will become more severe over time. NJ TRANSIT is developing a holistic long-term climate adaptation and resilience strategy for the agency, as well as continuing post-Sandy infrastructure improvements.

The agency is also planning new capital investment projects that it seeks to advance in the coming years. To enhance resilience of the transit network, NJ TRANSIT will conduct systematic resilience studies of bus, rail, and light rail infrastructure, assets, and services to determine the systems' short- and long-term exposure to climate change impacts. Based on these assessments, the agency will prioritize and develop resilience and adaptation projects to protect vulnerable critical assets. To complement these efforts, the agency will develop an asset-criticality approach to understand the level of impact that failure of specific assets has on the transit network.

PARTNERSHIPS AND INITIATIVES

The complex nature of disaster preparedness, emergency response, and long-term climate adaptation requires extensive coordination throughout the agency and with external stakeholders across multiple disciplines. To respond appropriately, NJ TRANSIT must engage expertise in transportation systems, climate science, and emergency response. Therefore, NJ TRANSIT engages in several partnerships and initiatives to increase staff capacity to respond during emergency events and coordinate climate resilience actions with other state agencies.

NJ TRANSIT invests in emergency response training for current staff members through the Texas A&M Engineering Extension Service (TEEX) training program to enhance coordination between operating units during emergency preparation and recovery. Funded by the Department of Homeland Security, this course is designed to enhance operational staff's decision-making and preparedness skills to manage and support the response to an expanding emergency incident like an extreme storm.

The agency recognizes the importance of embedding climate resilience in every investment decision across all operations units and disciplines. To advance this

goal, NJ TRANSIT has hired a Resilience Capital Planning Manager to serve as dedicated staff to coordinate long-term capital climate change resilience plans and investments between operating units, NJT-OEM, and NJ TRANSIT capital programs.

NJ TRANSIT is coordinating its long-term resilience strategy and investments with fellow state agencies through its active participation in the New Jersey Interagency Council on Climate Change to advance the New Jersey Climate Change Resilience Strategy. Through this collective of 22 state agencies, NJ TRANSIT and its peers coordinate climate change mitigation and adaptation policy as well as programmatic and regulatory actions being implemented by each respective agency.

Finally, NJ TRANSIT is identifying new resources to fund its future resilience improvements. The agency's contributions to the forthcoming New Jersey State Hazard Mitigation Plan 2024 Update will unlock new state and federal funding opportunities that can finance new, resilient infrastructure investments. Updated every five years, this plan outlines a strategy to reduce risks from hazards and serves as the basis for prioritizing future project funding.

Collaboration between NJ TRANSIT employees



ASPIRATIONS AND CHALLENGES

NJ TRANSIT'S VISION FOR SUSTAINABILITY



Kevin Corbett speaks at an electric bus event

Achieving a more sustainable transportation system for the state of New Jersey is of critical importance to the state and beyond, as transportation accounts for over a quarter of all greenhouse gas emissions nationwide.⁸ As described throughout this document, NJ TRANSIT is poised to play a pivotal role in accomplishing this goal in four main ways: reducing reliance on single-occupancy vehicles by increasing ridership; reducing carbon emissions caused by congestion; enabling denser land use patterns that facilitate walking and cycling; and by increasing its own system-wide energy and fuel efficiency.

We are on our way to achieving those goals as an agency. On the capital side, NJ TRANSIT is investing in ways that improve the sustainability and resilience of our existing services, while also expanding service capacity in key corridors to encourage more sustainable travel. Operationally, a number of initiatives will help further reduce the carbon footprint of NJ TRANSIT. These include measures to conserve resources, reduce energy consumption and reliance on fossil fuels, and to control pollution. **Appendix A** provides a comprehensive listing of current and planned steps NJ TRANSIT is taking.

⁸ See [Greenhouse Gas Emissions \(epa.gov\)](https://www.epa.gov/greenhouse-gas-emissions), accessed January 15, 2023.

Some of NJ TRANSIT'S aspirations can be spearheaded by the agency itself and accomplished with partners' support. For example:



NJ TRANSIT aspires to bring all assets into a state-of-good repair and to improve the sustainability and resilience of NJ TRANSIT operations.



NJ TRANSIT aspires to expand the transit system to capture projected growth by implementing projects like the Hudson-Bergen Light Rail extensions and Secaucus to Meadowlands Transit Greenway.



NJ TRANSIT aspires to operate zero-emission vehicle fleets.

Yet, larger aspirations will require considerable multi-party action. Many of the steps required to improve sustainability and resilience are primarily problems of coordination and support rather than challenges of science or technology. NJ TRANSIT is no newcomer to multi-party action. The agency currently provides technical assistance to communities as part of the state's Transit Village Initiative, which helps communities redevelop areas around transit stations to accommodate growth in sustainable, transit-friendly ways. To date, NJ TRANSIT has assisted more than 40 communities and collaborated on more than 70 local, transit-friendly vision plans for station areas around the state. The agency also partners with Transportation Management Associations and other local agencies to assist in their efforts to increase the use of sustainable travel modes by bridging the first/last mile gap for riders.



ACHIEVING SOME ASPIRATIONS WILL REQUIRE LEADERSHIP FROM AND COORDINATED ACTION WITH PARTIES OUTSIDE THE AGENCY.

For instance, NJ TRANSIT aspires to accelerate a shift away from higher-polluting modes of travel toward greater use of transit, walking, and cycling. Accomplishing this worthy goal will require significant action from local, state, and federal actors in the domains of funding, land use regulation, environmental review, street and signal design, and policies that affect the monetary cost to travelers when considering using transit versus driving a car.

NJ TRANSIT Light Rail

CHALLENGES TO ACHIEVING THE VISION

A key component to increasing sustainability statewide is growing the ridership of NJ TRANSIT. Yet, a 2013 study by the UCLA Institute of Transportation Studies concluded that most of the major factors that influence a person's decision to choose public transportation

lie outside the direct control of transit agencies. Important determinants of transit use such as land use coordination and the convenience and cost of driving and parking are largely a function of state and local governments.



Land Use Action in Support of Public Transportation

The State of New Jersey has been a leader in land-use policies that support transit ridership through its Transit Village Initiative. However, while existing policies may have been effective at increasing the proportion of New Jersey residents for whom high-quality transit is available, much work remains to be done. The viability of public transportation as an instrument for sustainable action relies on zoning and local transportation infrastructure policies that are conducive to dense and pedestrian-scale development. Targeted policy change could advance sustainability from both a transportation and community perspective.

In general, NJ TRANSIT's role in land use policy is limited to a supporting role for state, county, and municipal partners. The sustainability and resilience of the state would be enhanced by broadening land-use policies and strategies aimed at incentivizing development that encourages transit use. It is also important to disincentivize development in environments that necessitate reliance on automobiles. Reforming land use policies within the state to incorporate sustainable objectives would require a broad coalition of government and community stakeholders.



Transit-oriented development at Orange Station



Newark Broad Street Station is a commuter rail and light rail station that was added to the National Register of Historic Places in recognition of its historical significance



Regulatory Challenges

Transit operates within a highly regulated environment that impacts the agency's ability to make significant improvements and changes to the transportation network. For example, the environmental review process, including historic preservation considerations, often introduces significant delay to adopting more sustainable transportation project design. This process, and the legal challenges that often spring from it, tend to reward business-as-usual proposals while proposals for innovative ideas, including compact development, new roadway designs, or transit-supportive infrastructure are put through a complicated and lengthy review.

As seen with the HBLR Northern Branch, the Environmental Impact Statement (EIS) review originally submitted to the Federal Transit Administration (FTA) in 2018 was delayed until 2020 due to lack of project funding. This delay has resulted in the need for a new EIS to be drafted. Today, depending on the size, type, complexity, level of public concern, and potential impacts, projects can be subject to review periods by the lead agencies (FTA/Federal Railroad Administration (FRA)) from 12 to 24 months. This does not include the extensive pre-environmental/National Environmental Policy Act (NEPA) period where work is completed to justify and identify a preferred alternative to enter the environmental process. Moreover, large projects that require additional permit actions from federal agencies such as the U.S. Army Corps of Engineers (ACOE), Federal Emergency Management Agency (FEMA), and others, are subject to additional delays from six to 18 months on average. New Jersey should explore avenues to support faster and less contentious review processes for projects that aim to reduce carbon emissions or increase climate resilience. NJ TRANSIT will seek partnerships with other agencies to identify opportunities to streamline the process.



Metropark Development Project will be built in phases, and consist of Class A office and retail spaces and residential spaces



Funding Action in Support of Public Transportation

Every transit system in the world, even the densest and most efficient, is supported by substantial government funding. Unfortunately, the United States lags considerably behind its international peers in the level of funding provided for both capital and operating budgets, leaving this critical function to state and local governments.

Nationwide, demand for capital funding greatly outstrips the supply of federal funds. This has resulted in an environment in which large transit capital projects compete for a limited amount of federal capital funding, and many worthy projects either go unfunded or remain unfunded for decades.

State and local funds are often volatile and unpredictable resulting in funding levels that are insufficient to maintain a state-of-good repair for legacy infrastructure, let alone advance system expansion necessary to meet the needs of a growing population. To achieve New Jersey's sustainability goals, NJ TRANSIT will need to modernize its fleet, replace and upgrade aging infrastructure, and expand transit service to growth areas. These important steps toward system sustainability will require healthy and sustained funding.

New Jersey must work with Congress and others at the federal level to improve the funding mechanisms made available to support public transportation for both capital and operating expenses. At the state level, additional, reliable funding streams should be explored to aid NJ TRANSIT in maintaining its legacy infrastructure, improving reliability, and expanding transit service.

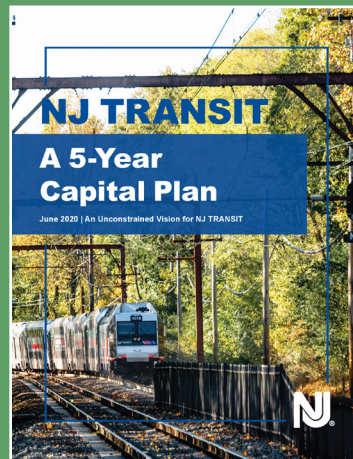
NEXT STEPS

This Sustainability Plan is a commitment to build and operate NJ TRANSIT sustainably. It is a forward-thinking, connective document that bridges NJ TRANSIT's Strategic and Five-Year Capital Plans.



10-Year Strategic Plan ⁹

The Sustainability Plan builds on the sustainability vision established in the 10-Year Strategic Plan, adding specific action items for both NJ TRANSIT and other parties from which critical support and coordination is needed.



5-Year Capital Plan ¹⁰

The Sustainability Plan expands on the foundational investment strategy and major projects in the Capital Plan to highlight sustainable and resilient operational strategies, standards, and initiatives.¹¹

Together, these three plans commit NJ TRANSIT to doing more, alone and in concert with others, to ensure a more sustainable and resilient New Jersey. Now is the time to rapidly increase the state's progress toward a sustainable future. With support from governmental entities, nongovernmental entities, and the public, NJ TRANSIT can achieve this vision.

⁹ See [NJ TRANSIT NJT2030 – A 10-Year Strategic Plan, June 2020](#)

¹⁰ See [NJ TRANSIT – A 5-Year Capital Plan, June 2020](#)

¹¹ See [NJ TRANSIT Capital Plan Update, July 8, 2022](#)

Your Actions in Support of NJ TRANSIT



With your help and perseverance, NJ TRANSIT's impact can be even greater!

This document spells out concrete actions that the agency is taking (see Appendix for more details), as well as NJ TRANSIT's ambitions for greater action that require multiparty support and coordination. New Jersey's sustainable future, however, requires stakeholder action as well.

Interested stakeholders are encouraged to support NJ TRANSIT's sustainability planning efforts at monthly board meetings and the quarterly meetings of the NJ TRANSIT Board's Energy & Sustainability Policy Committee. In addition to public meetings, stakeholders can also provide feedback at www.njtransit.com/sustainability.

Stakeholders are also encouraged to participate in the current effort to update the New Jersey State Development and Redevelopment Plan¹², which aims to coordinate statewide planning for land use, economic development, historic preservation, conservation, and transportation.

In addition, municipalities and counties should work with NJ TRANSIT in support of transit projects that make the best use of existing transportation infrastructure. Stakeholders should seek to make use of the often untapped FHWA Flexible Funding¹³ for public transportation projects to promote safer and more attractive routes to transit stops and stations.

It is critical to share a vision for New Jersey's future with decision-makers and elected officials that integrates a well-funded and sustainable NJ TRANSIT. The shortfalls in transit funding at every level of government must be rectified now to achieve decarbonization of the transportation sector. For the state to grow sustainably and serve the transportation needs of both population and employment growth expected in the region, financial support is critical. The value of public transportation has never been higher. This is a call to action that reflects the true value of public transportation in New Jersey's plans, policies, and investment strategies.

And of course, the best thing you can do to help NJ TRANSIT achieve its sustainability goals is to ride the system! We hope to see you on the light rail, bus, or train soon.

¹² See [New Jersey Office of Planning Advocacy's State Plan](#).

¹³ See [FHWA Flexible Funding for Transit and Highway Improvements](#)





NJ TRANSIT bus drivers



Hoboken ticket window



NJ TRANSIT Chief of Police, Christopher Trucillo (second from left) with fellow officers and colleagues at the Ride Kind launch



NJ TRANSIT conductor enters train



NJ TRANSIT employees at the PRIDE parade in Asbury Park



APPENDIX

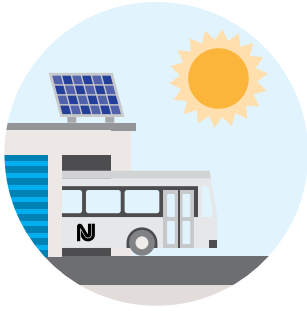
05	○	A	ACTION ITEMS
17	○	B	METHODOLOGY
21	○	C	GLOSSARY OF TERMS
25	○	D	RESOURCES & LINKS



Sustainability is the ability to meet the demands of existing and future transit customers by providing safe and reliable service, while supporting smart land use policies and prioritizing transit system modernization and expansion to prepare for a growing New Jersey population.

APPENDIX A

NJ TRANSIT ACTION ITEMS



AIR QUALITY & ENERGY

GOAL

Minimize harmful air quality impacts resulting from Greenhouse Gas (GHG) emissions by implementing energy conservation practices, utilizing clean energy sources, and increasing transit ridership.

STRATEGY PURCHASE 100% ZERO-EMISSION BUSES BY 2032 (P.L. 2019, C.362) AND TRANSITION TO A 100% ZERO-EMISSION BUS FLEET BY 2040 (NJ2030)

ACTIONS	STATUS
Advance Bus Garage Modernization Program <i>Key Projects: Hilton Bus Garage, Meadowlands Bus Depot, Union City Bus Garage, Northern Bus Garage</i>	Three garages in design
Conduct the Zero-Emission Bus System Design and Investment Planning Study	Study underway
Implement Access Link EV Pilot Program	Access Link EV Transition Study and Pilot under contract
Evaluate new and emerging technologies (e.g., driver-assist technologies, fleet charge management)	Technology scan ongoing in partnership with UITP

STRATEGY BY 2025, AT LEAST 25% OF STATE-OWNED, NON-EMERGENCY LIGHT DUTY VEHICLES SHALL BE PLUG-IN ELECTRIC, AND 100% BY 2035 (P.L. 2019, C.362)

ACTIONS	STATUS
Convert non-revenue fleet vehicles to zero emission vehicles	Non-revenue fleet transition underway

STRATEGY CONVERT TO CLEAN ENERGY CONSISTENT WITH THE STATE'S ENERGY GOALS

ACTIONS	STATUS
Identify opportunities where renewable energy (e.g., solar) is feasible	Solar opportunities scan ongoing
Construct the Egg Harbor Garage Solar Canopy	Egg Harbor Garage Solar installation under contract
Complete Solar Bus Shelter Design Effort and Solar Standards Effort	Solar shelter design effort underway

STRATEGY ESTABLISH AND MAINTAIN FACILITIES' STATE OF GOOD REPAIR TO IMPROVE ENERGY AND OPERATIONAL EFFICIENCY

ACTIONS	STATUS
Develop a decision-making process for evaluating existing facility audit results and asset management findings	Facility audit methodology development underway
Evaluate and prioritize energy efficiency measures for new construction	Standards development for new construction underway
Integrate priority energy efficiency measures and sustainable design guidelines into design standards and capital planning processes	Standards development for new construction underway
<i>Key Projects: Newark Penn Station Modernization, Brick Church Station, Bloomfield Station, Walter Rand Transportation Center</i>	

STRATEGY EXPAND TRANSIT NETWORK TO INCREASE SERVICE AND ENCOURAGE MODE SHIFT TO TRANSIT

ACTIONS	STATUS
Advance Hudson-Bergen Light Rail (HBLR) Northern Branch	Project scope in development
Complete HBLR Route 440 Extension	Project in design
Advance Secaucus to Meadowlands Transit Greenway	Project underway
Complete Walter Rand Transportation Center Redevelopment	Project underway
Partner with peer transit agencies, educational institutions, environmental advocates, and communities to promote the benefits of transit and smart land use policy	Ongoing activities include Rutgers CAIT partnership, quarterly Energy & Sustainability Policy Committee Meetings with the NJ TRANSIT Board

STRATEGY IMPROVE FIRST/LAST-MILE ACCESS TO TRANSIT TO SUPPORT INCREASED TRANSIT USE

ACTIONS	STATUS
Partner with state and local agencies to support e-mobility solutions	Continue coordination with the state’s eight transportation management associations
Provide technical assistance for transition to electric fleets for local agencies and non-profits that serve the elderly and individuals with disabilities	Provide ongoing technical assistance via the Transit Village Program

STRATEGY ESTABLISH A PROCESS TO SET GHG REDUCTION TARGETS BY 2025

ACTIONS	STATUS
Establish data collection needs and coordinate with NJ TRANSIT operations	FY19 & FY22 benchmark collected. Incorporate data collection needs into the Sustainability Program (in development)
Establish baseline estimation for GHG emissions produced and displaced	Collect future year data and incorporate into the Sustainability Program
Evaluate reduction pathways, including those related to energy efficiency, zero emission vehicles, renewable energy, and alternative fuels	In development



Part of NJ TRANSIT’s goal to minimize harmful air quality impacts is to purchase 100% zero-emission buses by 2032 and transition to a 100% zero-emission bus fleet by 2040

WHERE ARE WE NOW?

Air quality and energy use are intrinsically linked. The way NJ TRANSIT produces and consumes energy has a direct impact on the air we breathe. To establish a preliminary baseline for carbon dioxide equivalent (CO₂e) and criteria air pollutants (CAP), 2019 and 2022 data was analyzed. The baselines are for both the amount of CO₂e and CAP produced by operating the transit system, as well as the displacement of CO₂e and CAP through reduction in congestion, denser land-use, and mode shift to transit. The total metric tons (MT) CO₂e were normalized using the passenger miles traveled (PMT). The total metric tons (MT) CAP is the summation of PM, hydrocarbons (HC), CO, SO_x, and NO_x.

Even with less ridership due to COVID-19, NJ TRANSIT continued to provide service. This resulted in a slight decrease in the production of CO₂e and CAP from 2019 to 2022, due mainly to fewer transit vehicle miles driven. There was, however, a much larger decrease in the amount of displaced CO₂e and CAP, due to a significant decrease in passenger miles or PMT. The reduction in passenger miles from 3.3 million to 2.0 million resulted in a decrease of approximately 1.5 million metric tons of displaced CO₂e.

2019 Benchmark		2022 Benchmark	
Total metric tons of CO₂e produced:	623,100 CO ₂ e (MT)	Total metric tons of CO₂e produced:	583,300 CO ₂ e (MT)
Total metric tons of CO₂e displaced:	3,930,900 CO ₂ e (MT)	Total metric tons of CO₂e displaced:	2,408,400 CO ₂ e (MT)
Metric tons produced per passenger miles:	0.0002 CO ₂ e (MT)/PMT	Metric tons produced per passenger miles:	0.0003 CO ₂ e (MT)/PMT
Total metric tons CAP produced:	2,700 CAP (MT)	Total metric tons CAP produced:	2,600 CAP (MT)
Total metric tons CAP displaced:	124,100 CAP (MT)	Total metric tons CAP displaced:	83,500 CAP (MT)

To establish an energy preliminary baseline, the analysis focused on electric, compressed natural gas (CNG), diesel, gasoline, and heating oil usage in 2019 and 2022. Each of the aggregated energy types was converted into standard BTU energy levels using common factors. While NJ TRANSIT is beginning to see increases in ridership again, it has not returned to pre-pandemic levels. As a result, normalizing factors like PMT are still smaller in 2022 than they were in 2019, resulting in normalized energy use increasing over the 3-year period despite reductions in total energy use.

2019 Benchmark		2022 Benchmark	
Total energy use:	8,261,000 MMBtu	Total energy use:	8,261,000 MMBtu
Total energy use per million passenger miles:	0.003 MMBtu/PMT	Total energy use per million passenger miles:	0.003 MMBtu/PMT



RESILIENCE

GOAL

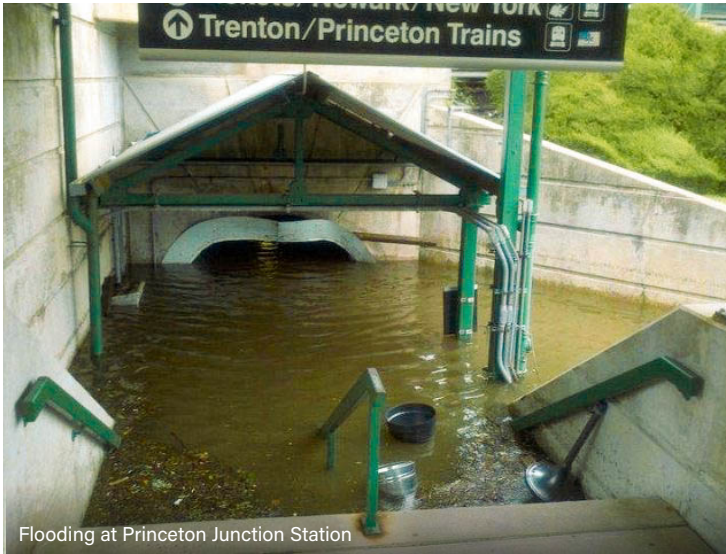
Enhance resilience of the transit system to withstand extreme climate events to sustain continuity of service and prepare for long-term climate change impacts.

STRATEGY ENHANCE NJ TRANSIT'S RESPONSE READINESS TO ALL-HAZARD EMERGENCY NEEDS

ACTIONS	STATUS
Continue investing in emergency response training for NJ TRANSIT staff to enhance coordination between operating units during emergency preparation and recovery	Host regular emergency response trainings
Continue annual updates to the agency's Comprehensive Emergency Management Plan (CEMP)	Update CEMP annually with input from NJ TRANSIT Operations
Improve and expand NJ TRANSIT Flood Early Warning System	Continue expansion of NJ TRANSIT's Flood Early Warning System

STRATEGY ENHANCE THE TRANSIT SYSTEM'S RESILIENCE TO EXTREME CLIMATE EVENTS (NJT 2030)

ACTIONS	STATUS
Conduct systematic resilience studies of bus, rail, and light rail infrastructure, assets, and services to study short- and long-term exposure to extreme weather and climate change impacts	Assessments in progress
Continue participation in the NJ Interagency Council on Climate Change to implement NJ Statewide Climate Change Resilience Strategy	Participation ongoing
Coordinate with NJ EDCs and NJ Board of Public Utilities to stay updated on grid modernization efforts	Participation ongoing



Flooding at Princeton Junction Station



Damage to infrastructure from flooding

STRATEGY INVEST IN CAPITAL PROJECTS THAT MITIGATE CLIMATE CHANGE-INDUCED RISKS TO TRANSIT INFRASTRUCTURE (NJ HAZARD MITIGATION PLAN, NJT 2030)

ACTIONS	STATUS
Update 2024 Hazard Mitigation Plan with NJ TRANSIT's resilience needs	Publication of 2024 HMP update pending
Harden critical infrastructure and critical sites damaged by extreme storms	Critical infrastructure hardening projects in progress
Develop and implement climate mitigation, adaptation, and resilience infrastructure projects that protect vulnerable assets.	Project scoping ongoing
Advance Hoboken Terminal and Yard Master Planning and Design	Project in development

📍 WHERE ARE WE NOW?

NJ TRANSIT is developing metrics to gauge its progress toward enhancing the transit system's resilience to climate change. The agency's ongoing Resilient Design Guidelines and Standards development will form the basis of these benchmarks. The agency is also articulating a holistic, long-term climate adaptation and resilience strategy, as well as continuing post-Sandy and post-Ida infrastructure improvements. The agency is investing in staff training in disaster preparedness, emergency response, and long-term climate change impacts. Finally, the agency is identifying new resources to fund its future resilience improvements.



WASTE

GOAL

Minimize waste generated at NJ TRANSIT facilities and increase recycling levels.

STRATEGY ESTABLISH A PROCESS TO DEVELOP A LANDFILL DIVERSION GOAL FOR OPERATIONAL WASTE

ACTIONS	STATUS
Establish a baseline for present waste management practices	Started, FY19 & FY22 benchmark collected, FY23 to be collected
Incorporate best practices for waste management into operating standards	In development

STRATEGY ESTABLISH A PROCESS TO DEVELOP A LANDFILL DIVERSION GOAL FOR CONSTRUCTION AND DEMOLITION (C&D) WASTE

ACTIONS	STATUS
Collect data on C&D waste streams, quantities, disposal/recycling facilities, and baseline diversion rates for NJ TRANSIT projects	In development

STRATEGY INTEGRATE SOLID WASTE EFFICIENCY MEASURES INTO DESIGN STANDARDS AND CAPITAL PROGRAM PROCESSES

ACTIONS	STATUS
Develop a prioritization process for implementing waste reduction measures for new construction	In development
Identify opportunities to reuse materials on-site or at other NJ TRANSIT construction projects, including specifying on-site soil reuse requirements and/or establishing a central storage facility to stockpile excess materials for use on other projects	In development

📍 WHERE ARE WE NOW?

Municipal solid waste, cardboard, and single stream recycling metrics were calculated but not normalized because waste streams are not strongly influenced by the number of miles or passengers that use the system. As part of efforts to reduce waste to landfill, batteries, scrap metal, used oil, wooden railroad ties, and other materials are recycled. This and other recycling practices will continue to be encouraged as the sustainability journey continues, and details related to those efforts are anticipated in future plans. To establish a preliminary baseline for waste, 2022 data was analyzed. The data for 2019 from vendors was unavailable.

2022 Benchmark

Municipal Solid Waste:	15,440 tons
Cardboard:	37 tons
Single Stream Recycling:	1,018 tons

Construction at Portal North Bridge





WATER

GOAL

Improve water use efficiency at NJ TRANSIT facilities through conservation, reuse, and incorporation of water management best practices.

STRATEGY ESTABLISH A PROCESS TO DEVELOP A WATER REDUCTION GOAL

ACTIONS	STATUS
Establish a baseline for water usage	Started, FY19 & FY22 benchmark collected, FY23 to be collected.

STRATEGY INTEGRATE WATER USE EFFICIENCY MEASURES INTO DESIGN STANDARDS AND CAPITAL PLANNING PROCESSES

ACTIONS	STATUS
Develop a prioritization process for implementing water conservation measures for new construction	In development
Integrate water conservation measures into design standards and capital planning processes	In development

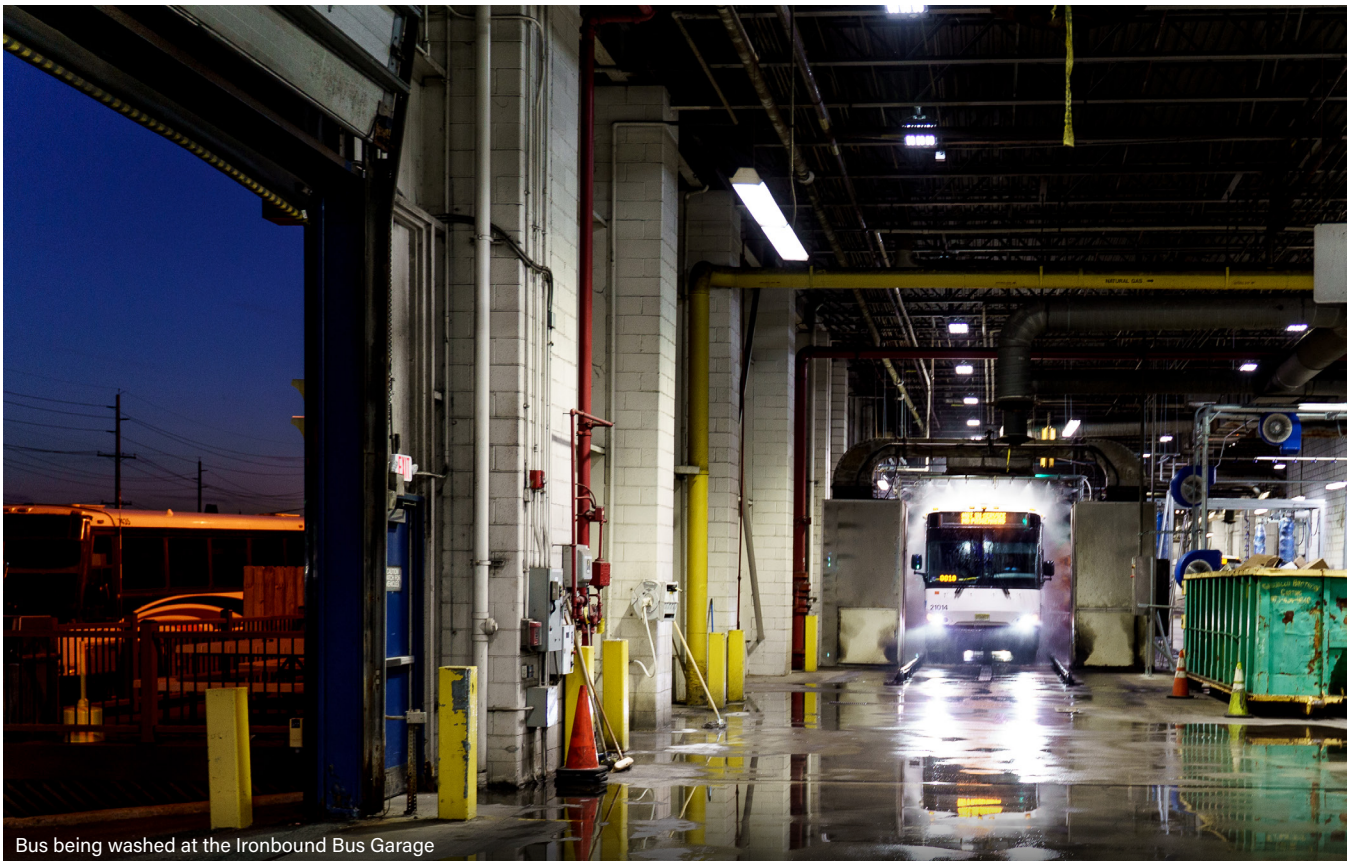
STRATEGY OPTIMIZE INDUSTRIAL WATER DISCHARGES AT NJ TRANSIT FACILITIES

ACTIONS	STATUS
Evaluate current status of water discharges (where performed, how much water is recycled - e.g., bus and rail vehicle washing)	In development
Implement improvement options, such as green infrastructure, where feasible	In development

📍 WHERE ARE WE NOW?

To establish a preliminary baseline for water usage, facility-level utility bills were analyzed for 2019 and 2022. Each non-zero usage data point was converted to average gallons per day (GPD) and then multiplied by 365 to estimate gallons per year (GPY). All GPYs by site were averaged to estimate usage per year and the preliminary baseline. Per APTA guidance, vehicle revenue miles (VRM) was used to normalize the water usage value. The difference in water usage is mostly due to the higher amount of water usage from rail facility sources in FY22.

2019 Benchmark		2022 Benchmark	
Total water use:	447,017,000 gallons	Total water use:	505,161,000 gallons
VRM:	162,231,737 miles	VRM:	156,035,496 miles
Normalized:	2.8 gal/VRM	Normalized:	3.2 gal/VRM



Bus being washed at the Ironbound Bus Garage

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APPENDIX B

METHODOLOGY

METHODOLOGY

Sustainability Planning Process

NJ TRANSIT conducted a multi-step planning process following recommendations from the Global Reporting Initiative (GRI) in order to develop this Sustainability Plan. As a result, the plan reflects the issues that matter most to the NJ TRANSIT employees, customers, and communities that were involved in the planning process. Steps in the process included:

- Formal engagement with both internal and external stakeholders to determine the relative significance of sustainability topics, considering both the potential impact to operations and their influence on stakeholders' decisions about an organization.
- Surveys administered to internal and external stakeholders to understand perceptions regarding NJ TRANSIT's sustainability performance and to solicit feedback on sustainability measures that would be suitable for implementation. The surveys were widely advertised through press releases, public webinars, the NJ TRANSIT website, social media, and digital display boards in transit stations.
- Interviews with more than 50 NJ TRANSIT Subject Matter Experts (SMEs) to acquire further insight into sustainability plans, policies, and practices relevant to NJ TRANSIT's sustainability performance.
- Industry benchmarking conducted for five peer transit agencies, selected based on their sustainability leadership, size, and geographic location, including: Metropolitan Transportation Authority (MTA), Massachusetts Bay Authority (MBTA), Los Angeles County Metropolitan Transportation Authority (LA Metro), Chicago Transit Authority (CTA), and Southeastern Pennsylvania Transportation Authority (SEPTA). Publicly available information was reviewed, including agency sustainability reports, agency sustainability/environmental websites, annual reports and board books.



More information on the sustainability planning process and the feedback received during the engagement process can be found at www.njtransit.com/sustainabilityplan.

A Draft Sustainability Plan was published in June 2023 and a webinar was held to review the plan and solicit feedback. Comments received during the webinar and a 30-day public comment period were addressed in the Final Sustainability Plan, as appropriate, and in a public fact sheet found at www.njtransit.com/sustainabilityplan.

Data Collection

A robust data collection and analysis effort is required to prepare a sustainability inventory from which measurable and quantifiable targets can be set to document future performance. NJ TRANSIT collected and analyzed data to establish a baseline from which to measure progress over time for:

- Water usage
- Criteria Air Pollutant (CAP) emissions
- Greenhouse Gas (GHG) emissions and savings
- Energy use (electricity, fuel)
- Recycling levels/waste
- Operating expense
- Unlinked passenger trips (UPT) per capita in the service area of operation
- Vehicle revenue miles (VRM)
- Vehicle miles traveled (VMT) per capita in the service area of operation

NJ TRANSIT used data from the Accounts Payable group, department records, vendor invoices, supplier invoices, and utility bills. Portions of this work took place at the facility level for each essential service provided by NJ TRANSIT – bus, light rail, rail, paratransit – and corporate. Data was collected for two years: 2019 and 2022, the most recent year is available but is one that reflects the pandemic’s ongoing effects on ridership.



The main source of transit agency emissions reductions is the diversion of trips to transit service. For the NJ TRANSIT Sustainability Plan, these displaced GHG emissions are quantified using the recommended methodology from APTA’s Quantifying and Reporting Transit Sustainability Metrics¹⁴ document and Recommended Practice Quantifying Greenhouse Gas Emissions from Transit¹⁵. The displacement is calculated in three ways:

- **Mode Shift to Transit:** the avoided car trips by shifting drivers to transit riders.
- **Congestion Relief:** improvement in traffic flow and fuel efficiency due to fewer drivers/vehicles on the roadway; includes reductions in idling.
- **Land-Use:** by enabling denser land-use patterns that promote walking or cycling, shorter trips overall, and reduced car use.

For each of these three factors, APTA provides recommendations for data sources that are appropriate for the scale of an agency and the communities they serve. In addition to displaced emissions, APTA recommends the quantification of emissions generated through mobile combustion and electricity use to power transit vehicles. Each of these emissions categories, along with displaced emissions, was included in the data analysis conducted for NJ TRANSIT’s first Sustainability Plan.

NJ TRANSIT considered Scope 1 emissions (i.e., direct greenhouse gas (GHG) emissions that occur from sources that are controlled or owned by NJ TRANSIT such as the emissions associated with our buses and facilities) as well as Scope 2 emissions (i.e., indirect GHG emissions associated with the purchase of electricity, steam, heat, or cooling) in the data analysis¹⁶. Scope 3 emissions (i.e., emissions from purchased goods, recycling, and employee commuting) were not calculated for this Sustainability Plan¹⁷. The calculation of Scope 3 emissions can be a significant challenge because of data limitations and issues related to agency control. Future sustainability planning and data collection efforts will seek opportunities to measure Scope 3 emissions, but the measurement of this emissions type is beyond the scope of this first plan.



¹⁴ See [APTA’s Quantifying and Reporting Transit Sustainability Metrics](#).

¹⁵ See [APTA’s Recommended Practice Quantifying Greenhouse Gas Emissions from Transit](#)

¹⁶ See [EPA’s Scope 1 and Scope 2 Inventory Guidance](#)

¹⁷ See [EPA’s Scope 3 Inventory Guidance](#)

Data Analysis

The methodology developed to cleanse and aggregate data for future reporting purposes followed APTA guidance, which suggests normalizing factors that can be used to better present how transit agencies are performing with respect to sustainability. Totals (e.g., GHG emissions, energy usage) are divided by Passenger Miles Traveled (PMT) to better express sustainability progress relative to ridership and trip length.

To aggregate the data for a baseline year, the following steps were utilized:

1 If the data was collected manually as opposed to digitally from invoices, then it was manually entered into an Excel spreadsheet for evaluation and processing. If the data was digital, the data were imported directly into Excel.

2 For each subcomponent of the metrics and baseline information, data were evaluated based on the following criteria:

- a.** Identification of duplicates (e.g., the same facility has been reported more than once in a data set)
- b.** Identification of missing items (e.g., a facility in the list does not appear in the data set collected)
- c.** Identification of corrupted data (e.g., finding text or date data in an “amount type” numeric field)
- d.** Identification of outliers in the data (e.g., data values that were far above or below the “norm,” typically measured in two standard deviations beyond the norm). Conditional formatting could be used in Excel to color a cell if beyond a standard deviation.

3 Corrected data anomalies or outliers identified in Step 2 before proceeding. This included communication with the data owner to understand missing or duplicate conditions or why specific items fall outside the normal range. It also involved estimating a missing value (e.g., there was a missing scrap waste invoice from a hauler for one month).

4 Summarized the individual values from each data set and aggregated into the summaries of like data sets (e.g., summarized data sets containing diesel fuel, then combined all diesel fuel data sets to develop a composite diesel fuel value for a metric across its subcomponents).

Since 2022 ridership and associated PMT was significantly lower than in 2019 due to the effects of the COVID-19 pandemic, data collection and analysis of year 2023 year is needed to establish a true baseline inventory that can be used for future reporting of quantitative reduction targets. As NJ TRANSIT continues to recover ridership from the effects of COVID-19, collecting and analyzing several data sets against the normalized metric of PMT will allow an understanding of how ridership changes affect the use of environmental resources.

APPENDIX C

GLOSSARY OF TERMS

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All Hazards. FEMA standard for all human-made and natural disaster threats.

“As-of Right” Zoning. This zoning framework allows for development at increased density with an appropriate contribution to a transit district fund that supports the cost of transit infrastructure maintenance and other public realm improvements.

Battery Electric Bus (BEB). Buses that run on electricity and require recharging their onboard battery packs from an external power source.

Capital. Expenses related to the purchase of capital equipment and financing capital projects. Capital expenses are non-annually recurring and do not include operating expenses such as preventative maintenance.

Capital Investment. Investment of funds into projects requiring capital such as buildings, bridges, or vehicle purchases.

Carbon Dioxide Equivalent (CO₂e). The number of metric tons of CO₂ emissions with the same global warming potential as one metric ton of another greenhouse gas.

Climate Adaptation. Adjusting to actual or expected climate change and its effects; actions seek to moderate or avoid harm or exploit beneficial opportunities from climate change.

Climate Mitigation. Preventing or reducing the emission of greenhouse gases (GHG) into the atmosphere to make the impacts of climate change less severe and to limit future warming.

Climate Resilience. The ability of social and ecological systems to absorb and adapt to shocks and stresses resulting from a changing climate, while becoming better positioned to respond in the future.

Criteria Air Pollutant (CAP). Six commonly found air pollutants: carbon monoxide, lead, ground-level ozone, particulate matter, nitrogen dioxide, and sulfur dioxide, which are regulated under the Clean Air Act by the U.S. EPA.

Decarbonization. Reduction or removal of carbon dioxide emissions from the atmosphere by preventing emissions through the use of zero-carbon renewable energy sources, capturing emissions via carbon capture technology, or enhancing carbon storage in agricultural lands and forests.

Environmental Justice Communities. New Jersey defines Environmental Justice Communities by three criteria: presence in a community of concern (at least 35% of households qualify as low-income or at least 40% identify as minority or at least 40% have limited English proficiency); the presence of disproportionate environmental and public health stressors; and the absence or lack of environmental and public health benefits.

Dual Power Diesel-Electric Locomotive. A type of locomotive that can be powered either from an electricity supply (like an electric locomotive) or by using the onboard diesel engine (like a diesel-electric locomotive).

Dual Stream Recycling. A recyclable materials collection system wherein bottles, cans, and containers are collected in one curbside bucket, bin, or cart, while paper grades are collected in another bucket, bin or cart.

Event-Based Flooding. Flooding due to a storm or other natural event.

Extreme Heat Events. A period where high air temperatures impact human health or day to day activities. Heat waves are expected to grow more frequent and last longer, stressing power grid demand, increasing air pollution, and putting people at greater risk of heat-related disability and mortality.

Extreme Storms. Storms that may result in high levels of damage or disruption. These consequences limit NJ TRANSIT's ability to operate service after an event and require significant labor force to restore service.

Erosion. The process of eroding or being eroded by wind, water, or other natural agents, which can result from increases in rainfall intensity. Bridge scour, or the removal of sediment (such as sand and gravel) around bridge abutments or piers, is a form of erosion that results from extreme precipitation events.

Greenhouse Gases. Gases in the earth's atmosphere that trap heat creating a greenhouse effect and results in global warming and climate change.

Greenway. A corridor of protected open space that is maintained for conservation, recreation, and non-motorized transportation.

Infrastructure. Infrastructure is the basic facilities and systems serving a country, city, or area. NJ TRANSIT infrastructure includes physical assets such as buildings, bridges, and rail right-of-way (track, switches, etc.).

Overhead Catenary. A system of overhead wires used to supply electricity to a locomotive, streetcar, or light rail vehicle which is equipped with a pantograph.

Passenger Miles Traveled (PMT). The miles that passenger cars are scheduled to or actually travel while in revenue service.

Rain Gardens. A depressed area in the landscape that collects rainwater from a roof, driveway, or street and allows it to soak into the ground. Planted with grasses and flowering perennials, rain gardens can be a cost effective and beautiful way to reduce runoff. Rain gardens can also help filter out pollutants in runoff and provide food and shelter for wildlife.

Resilience. The ability of social and ecological systems to absorb and adapt to shocks and stresses resulting from a changing climate, while becoming better positioned to respond in the future.

Rising Ambient Temperatures. Projections anticipate that, by 2050, temperatures across New Jersey will increase by 4.1 to 5.7 degrees. High temperatures can stress bridge integrity, cause track buckling and weakening, overload technical equipment, and accelerate infrastructure deterioration. These physical breakdowns translate to more frequent and extended delays to rail, light rail, and bus service.

Rolling Stock. Transit vehicles such as buses, vans, cars, railcars, or locomotives.

Saltwater Exposure: Exposure to sea or saltwater, especially damaging to metal infrastructure. As marshes migrate inland, coastal and low-lying track, yards, facilities, and other critical infrastructure grow more vulnerable to erosion and chronic flooding. Formerly dry or freshwater environments newly exposed to salt or brackish water may see accelerated track deterioration.

Sea Level Rise. Increase in average sea levels leading to flood potential in coastal or river delta areas. Sea level rise exacerbates stormwater flooding during regular precipitation events as well as extreme storms.

Single Stream Recycling. A system in which all recyclables, including newspaper, cardboard, plastic, aluminum, junk mail, etc., are placed in a single bin or cart for recycling.

Solar Canopy. Overhead roof or structure with solar panels on top.

Solar Photovoltaic (PV). Commonly called a solar cell, a nonmechanical device that converts sunlight directly into electricity. Some PV cells can convert artificial light into electricity.

Stormwater Runoff. Rain and snowmelt that flows over land or impervious surfaces, such as paved streets, parking lots, and building rooftops, and does not soak into the ground.

State of Good Repair. A condition in which physical assets, both individually and as a system, are functioning as designed within their useful service life and are kept functional through regular maintenance.

Sustainability. The ability to meet the needs of today without compromising the needs of future generations.

System Modernization. A process of updating and replacing outdated or inefficient systems, processes, or applications.

Track-bed. The groundwork onto which a railway track is laid.

Transit-Oriented Development (TOD). A planned and designed development that maximizes the amount of residential, business, and recreational space within walking distance of public transportation.

Urban Mobility. Movements of both people and goods that occur in a city via public or private transportation.

Unlinked Passenger Trip (UTP). The number of times passengers board public transportation vehicles. Passengers are counted each time they board vehicles no matter how many vehicles they use to travel from their origin to their destination.

Vehicle Miles Traveled (VMT). A measure of the amount of travel for all vehicles in a geographic area over a given period of time.

Vehicle Revenue Miles (VRM). The miles that vehicles are scheduled to, or actually, travel while in revenue service. Vehicle revenue miles include layover recovery time. Vehicle revenue miles exclude: Deadhead; Operator training; Vehicle maintenance testing; and Other non-revenue uses of vehicles.

Wildfire Risk. Risk of an unplanned fire burning in natural areas such as forests, shrub lands, or grasslands. Potential wildfire impacts on transit infrastructure include increased likelihood for future landslides, loss of control systems like traffic lights and signage, and erosion.

Zero Emission Vehicle. Vehicles that do not emit exhaust gas or other pollutants from the onboard source of power.

APPENDIX D

RESOURCES & LINKS

RESOURCES & LINKS

1. NJDEP, State of NJ Climate Resilience Strategy <https://dep.nj.gov/climatechange/resilience/resilience-strategy/>
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11. NJ TRANSIT, Capital Plan Update, July 8, 2022 https://content.njtransit.com/sites/default/files/njtplans/NJ%20TRANSIT%20Capital%20Plan%202022%20Update_Narrative_7.8.22_FINAL%20v2.pdf

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14. APTA, Quantifying Greenhouse Gas Emissions from Transit https://www.apta.com/wp-content/uploads/Resources/resources/hottopics/sustainability/Documents/APTA_SUDS_CC_RP_003_12_Quantifying_Reporting_Transit_Sustainability_Metrics_Published_2Q2012.pdf
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16. USEPA, Scope 1 and Scope 2 Inventory Guidance <https://www.epa.gov/climateleadership/scope-1-and-scope-2-inventory-guidance>
17. USEPA, Scope 3 Inventory Guidance <https://www.epa.gov/climateleadership/scope-3-inventory-guidance>
18. SJTPO, Long-Range Planning RTP 2050: Moving South Jersey Forward <https://sjtpo.org/rtp>
19. DVRPC, Long-Range Plan Update: Connections 2050 <https://www.dvrpc.org/plan/>
20. Global Reporting Initiative, Consolidated Set of the GRI Standards <https://www.globalreporting.org/how-to-use-the-gri-standards/gri-standards-english-language/>
21. NJ TRANSIT, The Transit Friendly Planning Program <https://transit-friendly-planning-njtransit.hub.arcgis.com/>
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www.njtransit.com/sustainability

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