RHODE ISLAND PUBLIC TRANSIT AUTHORITY

CLIMATE ACTION PLAN 2022

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Message from RIPTA CEO Scott Avedisian

Last month, coastal erosion sent 30 feet of one of Rhode Island's most popular tourist attractions catapulting into the water. Newport's iconic Cliff Walk, served by the Rhode Island Public Transit Authority (RIPTA) and visited by thousands yearly, is yet another victim to the effects of climate change.

Government action on climate change is integral to limiting global warming and reducing the missions and concentrations of greenhouse gases. Embracing our leadership role as Rhode Island's Mobility Manager and statewide public transportation provider, RIPTA is committed to tackling this climate emergency.

Over the coming years, RIPTA will place sustainability at the center of our planning efforts including: embedding sustainability in all future projects; enhancing our fleet with zero-emission vehicles and efficient transportation systems; and strengthening our commitment to reducing greenhouse gas emissions.

We cannot pursue these goals independently. Working collectively with state agency leaders, external stakeholders, and other Northeast and Mid-Atlantic states, we will drive positive results.

Long before this Climate Action Plan was finalized, RIPTA was already battling climate change. In 2019, RIPTA launched a Zero-Emissions Vehicle Pilot Program with three leased buses. This initiative provided RIPTA with an opportunity to learn about this new technology, train staff, and test the performance of the electric buses on a variety of RIPTA routes. Next month, RIPTA will break ground on the State's first in-line charging station, which will charge our first ever fleet of fourteen New Flyer electric buses.

Our team is excited about these initiatives, and we invite you to learn more at RIPTA.com.

See you on board,

Scott Avedisian

Scott Avedisian, Chief Executive Officer

Introduction

Since 2010 and with each passing year, Rhode Island has experienced ever more severe weather events brought on by the effects of climate change. In response to events such as Hurricane Sandy, Tropical Storm Irene, and Winter Storm Nemo, the General Assembly passed the Resilient Rhode Island Act of 2014 which established the Executive Climate Change Coordinating Council (EC4) and established specific greenhouse gas reduction targets. The Rhode Island Public Transit Authority (RIPTA) had begun to undertake its own efforts to operate more resilient and greener service prior to 2014 but since the EC4's creation, the Authority has been an active participant in helping shape statewide policy concerning reducing emissions in the transportation sector.

Rhode Island is the biggest little state in the country with a population of 1,098,163. Over 50% live within just 11 square miles centered around Providence. This makes the state the second-densest in the entire country, with New Jersey being first. The state's density makes public transportation a viable mobility option for a majority of residents; unfortunately, only 3% of all trips are made on transit with the overwhelming number of trips (under 3 miles) made by automobile. The number of individuals using cars for travel has only grown over the years.

Although Rhode Island is in attainment under the Clean Air Act, the past four years has seen a dramatic rise in attention on reducing carbon emissions at both the state and local level including Providence's Climate Justice Plan and the General Assembly passing the 2021 Act on Climate which set legislatively mandated reduction targets with the goal of reaching net-zero by 2050. This legislation empowers all state agencies (and quasi-public authorities like RIPTA) to aggressively plan and implement strategies.

The Authority has composed this Climate Action Plan with the purpose of adopting approaches to address climate change and to develop ways to ensure RIPTA is resilient against those challenges both in the short and long term. The scope of this plan includes the following:

- Overview of past and current initiatives and plans
- Inventory of RIPTA's emissions
- RIPTA's goals and targets for emissions reduction
- Specific strategies and actions to be undertaken by the Authority
- The Authority's approach to implementing and monitoring this plan

RIPTA will work collaboratively with its federal, state, and local partners in carrying out a coordinated effort to minimize the impacts of climate change on vital government services, particularly public transit.

RIPTA is a participating agency of the Federal Transit Administration's *Sustainable Transit for a Healthy Planet Challenge*. The challenge seeks "to encourage transit agencies to build on the progress already made and to further reduce [Greenhouse Gas] (GHG) emissions from public transportation to support President Biden's GHG reduction goal." The administration's goal is "to achieve a 50-percent reduction from 2005 [GHG] levels in economy-wide net greenhouse gas (GHG) pollution in 2030." This Climate Action Plan is being submitted in response to the challenge.

The Authority will use the Action Plan as guidance in making business decisions in order to become a more sustainable agency and reduce or eliminate our carbon footprint. This plan shall be treated as a living document and will be reviewed on a regular basis and amended as needed to reflect new information, projects, plans, etc.

Agency Overview

RIPTA is a quasi-public, independent authority. Established in 1966, the Authority is charged with operating public transportation services throughout the State of Rhode Island.

There are currently 54 fixed bus routes and 6 Flex zones. The Authority is also responsible for administering and operating ADA paratransit services across 34 of the state's 39 municipalities. Transit services are focused out of hubs located in Providence, Newport, and Warwick.

The Authority owns and operates a fleet of 240 fixed-route buses, 94 paratransit vans, and 15 Flex vans. These vehicles are primarily maintained and stored at our Providence facility; however, a small contingent is based in Newport. All vehicles are diesel-powered (with a subset that are diesel-electric hybrids). In addition, the Authority utilizes vehicles for service and support roles within the agency.

RIPTA has begun the process of transitioning its fleet to electric with the introduction of 14 battery-electric buses that will exclusively run along our most frequent and highest ridership route connecting the cities of Providence and Pawtucket. The electric buses are currently being produced and are slated to be put into revenue service by the end of 2022. When this occurs, one in every five trips will be zero emissions. Agency staff is already hard at work at determining the next steps in progressing this effort and developing a long-term transition plan.

Past and Current Initiatives

RIPTA has long been involved in developing and implementing state-level policies as a member agency of the EC4 while also pursuing its own efforts to reduce carbon emissions. This section will discuss these efforts and studies in more detail.

Non-RIPTA Policies and Plans

Greenhouse Gas Reduction Plan

When the EC4 was established by the Rhode Island General Assembly in 2014, the council was charged with developing the state's first-ever **Greenhouse Gas Emissions Reduction Plan**. This document was completed in 2016 and made recommendations on how the state could achieve the set targets in the Resilient Rhode Island Act two years prior for each of the eight major sectors.

It found that the transportation sector alone made up the largest share of emissions statewide at 36%. Scenario modeling results indicated that a 10% reduction in vehicle miles traveled (VMT) relative to 2014 - the baseline year - would be an important contribution towards the state meeting the then-2050 target. The model showed that undertaking this would result in a mode shift to car alternatives including transit.

The EC4 agencies, as mandated by the 2021 Act on Climate, are currently collaborating on updating the 2016 document to reflect today's reality in 2022. This plan will be revised again in 2025 and then subsequently every five years through 2050.

Resilient Rhode Island Plan

The Statewide Climate Resilience Action Plan, also known as **Resilient Rhody,** was completed in July 2018 in response to the ever-increasing severity of weather events and rapidly changing environmental conditions which pose a significant risk to Rhode Island's communities, coastlines, forests, and aging infrastructure. A collaborative team of municipal and state organizations, led by the Infrastructure Bank, developed this bold yet implementable set of actions to prepare all for worsening effects caused by climate change.

50 miles of RIPTA route miles and hundreds of bus stops could be at risk due to the threat of sea-level rise. Resilient Rhody calls for the incorporation of solutions that can minimize short and medium-term exposure. The report also identified that as the Authority transitions its diesel-powered fleet to electric propulsion that additional investments will be needed (such as

power supply infrastructure at facilities) to ensure sufficient charging capacity and operational redundancies to minimize impacts to transit services.

Actions along these lines are being incorporated into current activities to fully electrify the R-Line and those services operated out of Newport. RIPTA staff continue to regularly meet with the other parties who wrote Resilient Rhody. A 3-Year Impact Report was released in late 2021 to provide information on how each action has progressed and identified success stories.

Roadmap to 100% Renewable Energy

To achieve substantial economy-wide greenhouse gas emissions, Rhode Island needs to accelerate the adoption of renewable electricity. In January 2020, Governor Raimondo signed Executive Order 20-01 which made Rhode Island the nation's first-ever state to set a goal of having 100% of a state's electricity demand be met by renewable energy by 2030. Rhode Island's Office of Energy Resources (OER) conducted an economic and energy market analysis and developed a **report** that identified the key factors that will guide efforts statewide, including those being considered by RIPTA, in the coming years. OER's guide also outlined policies that should be implemented.

Clean Transportation and Mobility Innovation Report

Rhode Island was one of the thirteen Northeast and Mid-Atlantic states plus the District of Columbia to come together on developing the Transportation and Climate Initiative (TCI) which would have established a regional effort to implement and manage a market-based approach to reduce emissions and invest proceeds to policies and modes to improve transportation systems and reduce pollution. The state was estimated to generate approximately $20 million per year from this program.

In order to better facilitate how these proceeds could be allocated within the state, Governor Raimondo assembled a working group of state agency leaders and external stakeholders with a deep understanding of the mobility, environmental, economic, and public health needs of Rhode Islanders. This group composed the **Clean Transportation and Mobility Innovation Report** which recommended initiatives to reduce greenhouse gas emissions and maximize clean mobility options for all Rhode Islanders. Among the recommendations in the report, it calls for focusing on the implementation of *Transit Forward RI 2040* (discussed in the next section), the transition of state fleets, including RIPTA's, to electric.

Although efforts to fully enact legislation that would formalize TCI collapsed during the last months of 2021, the contents of the working group's report have transformed into an overall

strategic framework for carrying out and addressing transportation-related emissions statewide and promoting ways to offer accessible and affordable clean transportation for all residents.

Electrifying Transportation Strategic Policy Guide

The General Assembly in 2021 passed H5031/S0994 which directed the Rhode Island Department of Transportation (RIDOT), the Division of Motor Vehicles (DMV), and OER to "develop a plan for a statewide electric vehicle charging station infrastructure in order to make such stations more accessible to the public." In response, they along with representatives from the Rhode Island Department of Environmental Management (DEM) and the Rhode Island Department of Health (RIDOH) developed a strategic policy guide entitled **Electrifying Transportation**. This document not only fulfilled the legislature's request but also set a framework where state agencies and stakeholders can coalesce around priorities and coordinate actions in the years to come.

Seven key priorities were identified through this process. Of these, notable ones include:

- Refining charging infrastructure programs to align with priorities and ensuring that they center equity such that benefits accrue to underserved and overburdened communities
- Demonstrate progress in electrifying transit, school buses, and medium- and heavy-duty vehicles in order to reduce harmful emissions and improve public health
- Conduct an analysis to understand transportation revenue impacts and develop recommendations for future action to ensure sustainable funding streams

The agencies who developed the strategy guide and other partner agencies active on the EC4 (including RIPTA) have each identified and committed to a specific priority action in 2022. The Authority is tasked with developing a detailed strategy to fully electrify its revenue fleet, including any necessary modifications to its infrastructure, workforce, route planning, or other core aspects of operating a successful public transit fleet. This will be accomplished through the Action Plan for Electrification and Service Growth (discussed in more detail in the next section).

2021 Act on Climate Legislation

Governor Dan McKee signed into law the **2021 Act on Climate** on April 14, 2021, which set mandatory and enforceable climate emissions reduction goals leading the state to achieve net-zero emissions economy-wide by 2050. This legislation updates the previous 2014 Resilient Rhode Island Act and calls upon the EC4 (of which RIPTA is a member agency) to establish, implement, and monitor strategies every five years through an update of the state's greenhouse gas reduction plan in addition to a regularly-maintained dashboard.

Providence Climate Justice Plan

Working closely with the city's Racial Environmental Justice Committee (REJC), the Office of Sustainability published the first-ever **Climate Justice Plan** in October 2019 which outlines the strategies and goals the city and its stakeholders would pursue in creating an equitable, low-carbon, and climate-resilient future. Since 30% of all citywide emissions are from transportation, the plan set ambitious targets in order to reduce its contribution. These include:

- 11% reduction in vehicle miles traveled (VMT) by 2035 and 20% reduction by 2050
- Increase the number of employers offering transit passes to their employees from 50 to 200 by 2035
- Increase public transit ridership within the city
- Increase low-carbon transit options in frontline communities

To reach the above targets, the plan calls for the city and stakeholders to advocate for further investment in cleaner and more accessible public transportation. This broad strategy encompasses the full electrification of RIPTA's bus fleet and service (with priority for those routes serving communities of color and low-income) and the implementation of the service and capital recommendations discussed throughout *Transit Forward RI 2040*.

RIPTA will continue to engage with the City, the REJC, and other stakeholders in helping to achieve the set targets.

RIPTA Policies, Plans, and Projects

Sustainable Fleet Transition Plan

Given RIPTA's role in meeting numerous interrelated federal, state, and local requirements for congestion mitigation, air quality improvement, and transit service reliability, many external stakeholders identified moving the agency's fleet to zero or near-zero emission had the potential to meet those obligations while supporting other statewide commitments. Over the course of 2018 and early 2019, the Authority carried out a technical assessment that evaluated the opportunities and implications of fleet conversion. It looked at commercially-available technologies, such as battery-electric, natural gas, and hydrogen fuel cell, to see amongst them which had the ability to meet RIPTA's operational needs. This analysis set the stage for current activities being done by staff right now.

The completed **assessment** was supported by 8 conversion scenarios (including some that combined technologies together) and found that while alternative fuels did offer increased capital costs and lower operational expenses, the operational savings did not fully offset the

incremental costs over time without incentive funding. However, when the scenarios compared emissions, electric and hydrogen fuel cell buses had the lowest emissions over time but natural gas options (standard or renewable) could offer the lowest emissions in the near term.

Final conclusions of the analysis recommended that RIPTA should adopt a graduated program that would involve demonstrations of the various technologies and use those experiences to help identify and implement a long-term transition to zero-emission buses while at the same time undertaking the variety of conversions required to support those efforts including those with the local utility, community partners, and other state agencies. This led to the Authority designing a battery-electric bus pilot that went live in Fall 2019. The demonstration has helped staff to collect critical data to aid decision-making and discern the challenges that would need to be resolved long term with the transition to whichever technology would is chosen.

Transit Infrastructure Sustainability Plan

Building off the previous Sustainable Fleet Transition Plan, the planning staff wanted to determine the Authority's full carbon footprint (FY2019) and explore sustainable greenhouse gas reduction solutions. This resulted in the completion of the **Transit Infrastructure Sustainability Plan** in April 2020 and provided further insights in terms of internal decision-making on capital projects and wider sustainability efforts by RIPTA.

The completed carbon footprint clearly showed that the agency's vehicles, both revenue and non-revenue, are responsible for 85% of all emissions with the remaining 15% primarily from operational facilities such as heating and electricity. More discussion on the carbon footprint is discussed in the next chapter of this action plan.

A variety of strategies related to vehicles were proposed and have since been incorporated into ongoing deliberations on long-term fleet transition. Recommendations pertaining to energy and buildings were given more consideration by staff. Notable ones include purchasing 100% renewable electricity, the exploration of on-site energy options, investing in energy audits, taking advantage of energy efficiency opportunities for buildings, and deploying an energy management system. Some of these have progressed (and will be discussed further under "Other Agency Initiatives") and others are being considered as part of this climate action plan.

Transit Forward RI 2040

In partnership with RIDOT and the Department of Administration's Division of Statewide Planning, RIPTA led the development of the state's first-ever transit master plan called ***Transit Forward RI 2040***. This 20-year vision outlines the service improvements and capital investments

that should be undertaken to improve mobility statewide and make Rhode Island a better place to live, work, and play. Its recommendations were adopted by the State Planning Council in December 2020 and incorporated as a core component of the new Long-Range Transportation Plan.

To accompany the recommendations, the project team composed a booklet describing the benefits of implementing the entire program of *Transit Forward RI 2040*. By achieving the substantial increases in service frequency and span system-wide (with the addition of new routes), it will result in a 60% growth in ridership over today, mode shift to alternatives such as transit, and reduce VMT by 8% overall - nearly reaching the 2050 target set in the 2016 GHG Reduction Plan written by the EC4. The VMT reduction translates to the removal of over 50,000 single-occupancy cars off Rhode Island's roads. Fulfilling the full program will reduce carbon emissions in the transportation sector by 231,300 metric tons per year.

Transit Forward RI 2040 is not fully funded but that has not stopped RIPTA from introducing service improvements and making strategic capital investments in the near term. We will continue to work with our federal and state partners.

Early Fleet Electrification

RIPTA's Sustainable Fleet Transition Plan recommended the implementation of a defined demonstration exercise involving battery-electric buses as a first step towards wider deployments. Acting on that advice, RIPTA brought in 3 leased Proterra battery-electric buses which have been instrumental in helping us collect vital data on vehicle performance, energy consumption, and other key metrics to guide decision-making. These ran initially throughout the network but in Spring 2020, it was determined after an analysis of known data that we would proceed with electrifying the R-Line and they had then been put full-time running between Providence and Pawtucket.

The initial demonstration results and the data collected over the subsequent year informed agency management to move forward with confidence to electrify all services operated on the R-Line. These services will be run by a dedicated fleet of 14 battery-electric buses with all of them being capable of in-line and depot-based charging. Based on the modeling done, it is expected that each bus will need to be recharged after every other trip and this will be accomplished using one of four in-line 450 kW pantograph fast chargers located at the southern end of the R-Line on the city line of Providence and Pawtucket. 5 slow (50kW) depot chargers will also be installed at RIPTA's Elmwood garage to allow the buses that need to be topped up overnight. Electric service on the R-Line is expected to be live in 2023.

As the R-Line electrification efforts moved from concept to implementation, staff began looking at the next opportunity to move from trial and error to broader adoption. After several internal meetings, it was decided that we would move forward with the full electrification of all our Newport-based transit services. This effort consists of five bus routes serving Newport, Middletown, Jamestown, North and South Kingstown, and Narragansett by 25 battery-electric buses and the installation of charging infrastructure at our Aquidneck Island garage and major transit hubs in the southern part of the state. RIPTA is in the process of fundraising and is planning to actualize this by Fiscal Year 2026. Completion of this project is a critical piece of RIPTA's ability to help the state meet its 2030 target as laid out in the Act on Climate.

Beyond the above electrification steps, planning staff are preparing to kick off a year-long study to further define how RIPTA can achieve full electrification as described below.

Action Plan for Electrification and Service Growth

The completion of *Transit Forward RI 2040* set a strategic vision of where we want transit services and infrastructure to be over the next two decades. Though it provides a framework, the master plan requires a formal implementation plan to understand the full impacts and requirements related to staffing and training needs, vehicles (including full electrification), facility improvements and expansion, and overall infrastructure.

Planning staff will soon begin writing a comprehensive document, to be known as the **Action Plan for Electrification and Service Growth (APEG)**, that will provide a clearer picture of the scale and timing of when investments will be required. This roadmap will be used agency-wide and will also serve as the agency's federally-required fleet transition plan. The estimated completion date for this effort is March 2023.

Other Agency Initiatives

In addition to the above plans, the Authority has carried out a range of green and sustainable actions on its own or influenced in part by other studies.

Green Building Practices

RIPTA's Administrative offices and paratransit operations are co-located at 705 Elmwood Avenue in Providence. This joint building was constructed in 2010 and incorporated green building features including:

- A white reflective roofing system to reduce heat island effects
- Installation of large skylights in the paratransit maintenance area to bring in natural light

- High-speed garage doors to reduce heat escape
- Low E-insulated windows
- High performing air and vapor barriers throughout the facility

On-Site Solar Power Generation

The Authority installed 1,134 250 kW solar panels as part of a larger re-roofing project at 265 Melrose Street (RIPTA Transportation Building) in 2013. Encompassing 37,258 square feet of roof area, the panels provide up to 283.5 kWh of energy generation equaling 350,600 kWh per year. Over a 25-year period, the panels will reduce agency electrical emissions by 6,180 metric tons of CO2. The panels were financed with an FTA Transit Infrastructure in Greenhouse Gas and Energy Reduction (TIGGER) grant and matched by RIPTA, the State of Rhode Island, and federal ARRA dollars.

Energy Efficient Lighting

All of RIPTA's facilities have energy-efficient lighting.

Green Building Practices

The Transit Infrastructure Sustainability Plan included a recommendation to purchase renewable energy. The Finance Department issued an RFP to prospective energy developers to enter a virtual net metering arrangement with RIPTA. An agreement was executed with Kearsarge Energy in January 2021 that has resulted in 93% of the agency's current electricity being offset by solar through energy credits. The energy is being produced on a 6,000-panel solar farm built on a brownfield site in East Providence. This is expected to save RIPTA over $250,000 in electricity costs per year.

Water Conservation

RIPTA recycles the water it uses to clean its fleet of vehicles.

Recycling

RIPTA recycles all scrap metals, tires, batteries, wood pallets, and motor oil. Older buses are 'scrapped' as opposed to reselling.

Bikes on Buses

All RIPTA buses allow cyclists to mount their bikes on the front of vehicles (limit 2 per bus).

Commuter Resources

RIPTA houses the Commuter Resource RI (CRRI) program which helps Rhode Islanders get around the state while saving time, money, and the environment. The staff is dedicated to

helping the public navigate RIPTA services as well as providing guidance for using other commuting alternatives such as carpooling, biking, and walking to work. The team is also responsible for administering the state's vanpool program in partnership with Commute with Enterprise.

Emissions Inventory

In Fiscal Year 2019, the Authority commissioned an inventory of its Scope 1 and 2 greenhouse gas emissions. It was found that RIPTA's total emissions equaled 28,030 metric tons of carbon dioxide equivalent (CO2e).

The primary source of emissions was found to be associated with the operation of the fleet of revenue and non-revenue vehicles used to provide and maintain public transit services statewide. This accounted for approximately 85% of total emissions due to the consumption of 2.29 million gallons of diesel fuel.

The remaining 15% of total emissions was determined to be related to the operation of our facilities including offices, depots, and maintenance facilities. During the respective fiscal year, we consumed approximately 640,000 therms of natural gas and 706,000 kWh of electricity.

RIPTA's vehicles account for the clear majority of RIPTA's total GHG emissions and therefore represent the largest, albeit possibly the most challenging, opportunity to significantly reduce RIPTA's impact on the environment. Therefore, while stationary sources should not be ignored, actions to address mobile emissions are essential.

Although Scope 3 emissions[1] were not directly inventoried in 2019, staff recognizes RIPTA does have substantial shared emissions connected upstream energy, solid wastes, employee travel, and the transportation and logistics in ensuring sufficient fuel and parts are available to keep the fleet operational on a daily basis.

Appendix A outlines the full methodology used by the Authority to complete its 2019 inventory.

RIPTA Planning staff intend to update the emissions inventory with FY2022 data so it can be compared against the FY2019 baseline. The department will work others within the agency to establish a process for annual upkeep of the inventory going forward.

[1] These emissions are the result from activities from assets not owned or controlled by the Authority but have an indirect impact on RIPTA's value chain.

Emission Reduction Goals and Targets

RIPTA, by virtue of its mission of providing transit services, plays a major role in curtailing carbon emissions statewide. Recognizing that we will continue to have a responsibility in helping Rhode Island (and the nation) in achieving their respective goals and targets, the Authority will be focused on fulfilling the following goals and targets:

1. Use 100% renewable electricity for operations by 2030.
2. Decrease total energy use by 10% for all facilities by 2030.
3. Decrease total GHG emissions from the transit fleet by 25% by 2030.
4. Achieve net-zero emissions by 2050.

The proposed goals and targets are in alignment with federal, state, and local GHG reduction efforts.

Strategies and Actions

The Authority will pursue the following strategies and actions to achieve the aforementioned goals and targets.

Goal #1: By 2030, use 100% renewable electricity for operations

Strategy	Actions	Metric to track progress	Timeframe	Responsible Office(s)
Convert to 100% renewable energy by 2030	Develop an energy action plan	Plan developed (Y/N)	April 2023	Planning, Finance
	Install on-site solar PV at Newport garage and renovated 265 Melrose facilities	Installations completed	September 2026	Planning, Finance
	Increase purchase of renewable energy to 50%	% change in renewable energy purchased	July 2025	Finance
	Increase purchase of renewable energy to 100%	% change in renewable energy purchased	July 2027	Finance
	Continue purchase of 100% renewable energy as fleet electrification grows	% change in renewable energy purchased	July 2030	Finance

Goal #2: Decrease total energy use by 10% for all facilities by 2030

Strategy	Actions	Metric to track progress	Timeframe	Responsible Office(s)
Decrease facility energy usage by 10% by 2030	Perform an energy audit for all facilities	Audits completed	June 2023	Finance, Facilities
	Identify and pursue energy efficiency opportunities	# of energy efficiency opportunities pursued and won successfully	March 2024	Finance, Facilities
	Deploy an energy management system	System deployed	September 2024	Finance, Facilities
	Implement energy efficient systems at facilities and monitor for 10% reduction	Year-to-year monitoring and # of energy efficient projects completed	July 2030	Facilities. Finance

Goal #3: Decrease total GHG emissions from the transit fleet by 25% by 2030.

Strategy	Actions	Metric to track progress	Timeframe	Responsible Office(s)
Electrify bus fleet	Develop Action Plan for Electrification and Service Growth	Plan completed	March 2023	Planning , Finance, Facilities
	Deploy 14 electric buses for the R-Line	# buses in operation	January 2023	Planning, Project Management, Vehicle Maintenance
	Upgrade Newport garage to accommodate electric buses	Facility upgrades complete (Y/N)	July 2025	Planning, Project Management, Facilities
	Issue and complete electric bus procurement	Procurement process completed (Y/N)	July 2024	Planning, Finance, Procurement, Vehicle Maintenance
	Purchase and deploy 25 electric buses for Newport operations	# of buses purchased	April 2025	Finance, Procurement, Project Management, Planning, Vehicle Maintenance
	Purchase and deploy 13 additional electric buses	# of buses purchased	January 2028	Planning, Finance, Procurement, Project Management, Vehicle Maintenance
	Continue fleet electrification process	# of buses purchased	2030 and beyond	Planning, Finance, Procurement, Vehicle Maintenance
	All maintenance and operational facilities made to accommodate zero-emissions technology	# of facility upgrades completed	Ongoing	Planning, Finance, Project Management, Facilities

Goal #4: Achieve net-zero emissions by 2050[2].

Strategy	Actions	Metric to track progress	Timeframe	Responsible Office(s)
Expand transit service	Increase frequency and span on all routes to the levels recommended in the TMP	# of routes that saw frequency or span increases per year	July 2040	Planning
	Introduce new routes as recommended in the TMP	# of new routes introduced per year	July 2040	Planning
Center equity and environmental justice	Develop high-capacity transit study with direct engagement from underrepresented and minority groups	Study completed	December 2023	Planning
	Increase accessibility for elderly and riders with disabilities	# of stops with shelters and benches added or improved	Ongoing	Planning
Increase ridership	Increase ridership to 35M annually	# of riders per year and % growth year-over-year	July 2040	Planning
Waste reduction	Go entirely paperless[3]	# of paper printed and # of paper cartons ordered per year	December 2024	All departments
Increase RIPTA involvement in land use decision-making	Pursue TOD planning funding and collaborate with municipalities on area studies	# of studies completed	January 2024	Planning
Active analysis of agency direct, indirect, and shared emissions	Annually update RIPTA emissions inventory including Scope 3 sources	Updated emissions inventory	2023 and beyond	Planning

[2] This goal has been set both by the current Biden Administration and has been legislatively mandated through the 2021 Act on Climate in Rhode Island. RIPTA will fulfill what it can within its immediate purview and provide assistance to other state agencies in helping to achieve the overall goal.

[3] To the extent permissible under state and federal law.

Implementation and Monitoring

RIPTA recognizes that it plays a major role in assisting the State of Rhode Island in achieving its overall carbon reduction goals and targets and has a responsibility in ensuring that its own goals and targets enumerated above are met. The Authority's CEO maintains a full seat on the state's EC4. Internally at RIPTA, the Budget and Long-Range Planning teams will work collaboratively on coordinating activities in connection with this plan and monitoring implementation performance. Other departments will be involved as applicable in the previous chapter.

The Climate Action Plan will be treated as a living document that should be reviewed on an annual basis. It should be amended as needed as new information is made available, to reflect new actions to be undertaken in relation to the set goals and targets of this plan, or as new projects and studies are carried out. The two teams will be tasked with this process and to engage with senior leadership (and the Board of Directors) as required.

The Authority intends to use this plan as a core document in making agency business decisions and helping shape the annual operating and capital budgets which set funding priorities. Other documents and plans that have a related role in decision-making and carrying out this climate action plan include:

- *Transit Forward RI 2040*
- Transit Asset Management Plan
- Facility Maintenance Plan
- The Action Plan for Electrification and Service Growth
- Other state plans such as the 2022 update to the state's Greenhouse Gas Reduction Plan (as required under the 2021 Act on Climate), the *Electrifying Transportation* State Guide Plan, and the Clean Transportation and Mobility Innovation Report

RIPTA's overarching implementation principle is that achieving the goals and targets set forth in the plan cannot be done in isolation, but rather through collaborative partnership with its fellow agencies on the EC4, such as the Department of Environmental Management (DEM), OER, DOT, etc., the General Assembly, and the people-at-large. The effects of climate change are not specific to any one sector, but to all parts of society.

Looking ahead, RIPTA staff is looking forward to engaging with its partners, interested external stakeholders, and others in moving transit forward for a better, more climate-resilient, and cleaner Rhode Island.

Appendix A: GHG Inventory Methodology

Inventory Boundaries and Data Sources

For the purposes of the RIPTA 2019 inventory, GHGs were defined by the six gases listed in the Kyoto Protocol: carbon dioxide (CO2); methane (CH4); nitrous oxide (N2O); hydrofluorocarbons (HFCs); perfluorocarbons (PFCs); and sulphur hexafluoride (SF6), plus nitrogen trifluoride (NF3). The RIPTA GHG inventory includes CO2, CH4, and N2O from electricity and fuel consumption. The inventory also includes refrigerant gases (HFCs) emitted directly to the atmosphere. Data received for the inventory indicated that PFCs, NF3 and SF6 were not emitted as part of RIPTA's operations and therefore are not included in the inventory in 2019.

The 2019 inventory was applicable to all wholly owned RIPTA subsidiaries and to part-owned subsidiaries over which RIPTA has operational control. This included RIPTA-owned and operated property and vehicles, and facilities where RIPTA has a capital lease. The inventory included Scope 1 emissions (all direct GHG emissions) and Scope 2 emissions (indirect GHG emissions from consumption of purchased electricity, heat or steam), as defined in the *GHG Protocol*. The Inventory includes the sources listed below:

Scope 1 (Direct Emissions):

- On-site stationary fossil fuel combustion (natural gas, distillate fuel oil and diesel)
- Fugitive emissions from stationary refrigeration
- Vehicle fuel combustion (e.g. RIPTA's revenue and non-revenue vehicles)
- Vehicle refrigerant emissions

Scope 2 (Indirect Emissions):

- Purchased electricity (calculated both by using both the market-based and location-based calculation methodologies)

Electricity and natural gas data were obtained from utility invoices. Facility and fleet refrigerant data, generator usage, revenue vehicle fuel consumed, non-revenue vehicle fuel economy, fuel consumed, and miles driven within each fiscal year were also obtained.

The emission factors that were used in defining RIPTA's GHG Inventory are from the U.S. Environmental Protection Agency (EPA) GHG Emission Factors Hub. Specific emissions factors are documented in the inventory tool itself.

GHG emissions were reported using the standard metric tons of carbon dioxide equivalent (tCO2e), the universal unit of measurement to indicate the global warming potential of each of the six greenhouse gases, expressed in terms of the global warming potential of one unit of carbon dioxide.

Fleet and Facilities

RIPTA staff produced a list of applicable vehicles and facilities for inclusion into the inventory.

Electricity

Within the U.S., electricity emissions factors were obtained from the U.S. EPA eGRID Sub-Region emissions factors. The latest emission factors available at the time of the 2019 inventory compilation were used.

There are two methods for calculating Scope 2 emissions – location-based and market-based. This updated methodology reflects changes to accounting introduced in the *GHG Protocol Scope 2 Guidance*. The location-based method considers average emission factors for the electricity grids that provide electricity to a reporting organization. RIPTA's location-based inventory was calculated using US EPA eGRID emission factors. The market-based method considers contractual arrangements under which the reporting organization procures power from specific suppliers or sources, such as renewable energy. For each facility, the most precise emission factor available was used.

It should be noted that Scope 2 electricity emissions were not broken out into location-based and market-based values because the values are the same. The scope 2 market-based value is the same as the location-based value because RIPTA did not procure renewable energy or have access to supplier specific factors and the residual mix factors are not properly defined for the US market (at the time of the inventory). The scope 2 market-based value will likely diverge from the location-based estimate in the future pending efforts by RIPTA to procure renewable energy and the availability of appropriate residual mix factors (this has since changed but the inventory does not reflect this currently).

Based on discussions with RIPTA staff in 2019, it was assumed that RIPTA did not retain the environmental attribute or renewable energy certificate (REC) from any electricity generated at the 265 Melrose rooftop solar installation that was included in the utilities data file when the inventory was carried out.

Stationary Fuels

The activity data for stationary fuel consumption at RIPTA facilities were associated with HVAC equipment and emergency generators and were totaled for each facility.

Mobile Sources

Activity data for vehicles owned or operated by RIPTA are collected annually. The total fuel consumption for revenue vehicles, by fleet, and the total fuel economy, consumption and miles driven for non-revenue vehicles, by each type of fuel, was input into the inventory calculator.

Refrigerants

Refrigerants used by RIPTA were referenced against a complete list of GHGs and entered in the inventory. For the inventory, it was assumed that top-up purchases were equal to emissions. Refrigerants are emitted from RIPTA vehicles that are equipped with air-conditioning. The total amount of hydrofluorocarbon (HFC-134a) obtained in FY 2019 was allocated to mobile vehicles. HFC-134a is the most common refrigerant used in recent model years for both light- and heavy-duty vehicles. HFC-134a is being phased out by the U.S. EPA for light-duty vehicles beginning with 2021 model years. However, buses are exempt from this requirement. If RIPTA is recharging any light duty vehicles with an HFC-134a replacement it would likely be hydrofluoroolefin (HFO-1234yf). It was assumed that 325 Melrose St., based on information provided by RIPTA, does not use air conditioning, and therefore no refrigerant gas emissions were estimated for the building. For facilities under operational control where no refrigerant data are available, estimations were made by multiplying the facility square footage by default refrigerant leakage rates.