

Acadia Clean Bus Initiative

FY 2024 RAISE Grant Application
February 2024



SUBMITTED BY:
Maine DOT



PARTNER:
Downeast Transportation, Inc.



1 PROJECT MERIT CRITERIA

1.1 CRITERION #1: SAFETY

Modernizing the bus fleet will enhance safety and reliability for the nearly 500,000 annual transit riders, continuing the strong safety record of the current system.

The investment will further reduce the number of private vehicles on roadways throughout Downeast Maine and drive mode shift to transit from single occupancy vehicles. The safety benefits of travel by public transit are well documented, with the American Public Transportation Association estimating a bus transit fatality rate one-thirtieth that of private vehicles.¹

This investment will address the safer vehicles objective of the Safe System Approach, in line with U.S. DOT's National Roadway Safety Strategy. Acknowledging that "redundancy is critical," new buses purchased will incorporate state-of-the-art vehicle safety features. The 35' buses will be purchased with maneuverability in mind, helping drivers avoid potential crashes as transit vehicles navigate the narrow rural roadways of Downeast Maine. They will be equipped with robust information technology systems, including vehicle location, passenger counters, voice and text stop announcements, GPS, and radios, to ensure safe transit in the event of adverse road conditions or congestion.

In alignment with the Federal Transit Administration's Safety Advisory 23-1 Bus-to-Person Collisions, the new vehicles will include lateral protective devices (also known as "side guards") to mitigate the crash risk between vulnerable road users and large transit vehicles, and elements consistent with a Federal Transit Administration 2023 safety advisory recommending vehicle design features (such as reducing the width of the A-pillar) and systems (such as collision detection and avoidance capabilities) to reduce bus-to-person collisions and increase safety for vulnerable road users.

Mode shift to public transportation will result in several significant safety benefits, including reducing congestion and alleviating safety issues that stem from slow and stopped vehicles. Additionally, mode shift to transit from private vehicles reduces the potential for collisions between private vehicles and pedestrians or bicyclists. It may also reduce parking at undesirable roadside shoulder locations in recreation areas, which forces visitors to walk in shared roadway spaces near destinations and crossroads at unmarked locations, thus reducing the likelihood of crashes for people walking along and crossing the road.

The design of the system prioritizes safety, too. For example, the walking distance between stops and common riders' destinations within communities in the service area is less than a

¹ [The Hidden Traffic Safety Solution: Public Transportation \(apta.com\)](https://www.apta.com/resources/press-releases/2023/04/2023-04-13-the-hidden-traffic-safety-solution-public-transportation)



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quarter-mile, which greatly reduces the risk and exposure of vehicle-pedestrian collisions for people accessing bus stops while walking or wheeling.

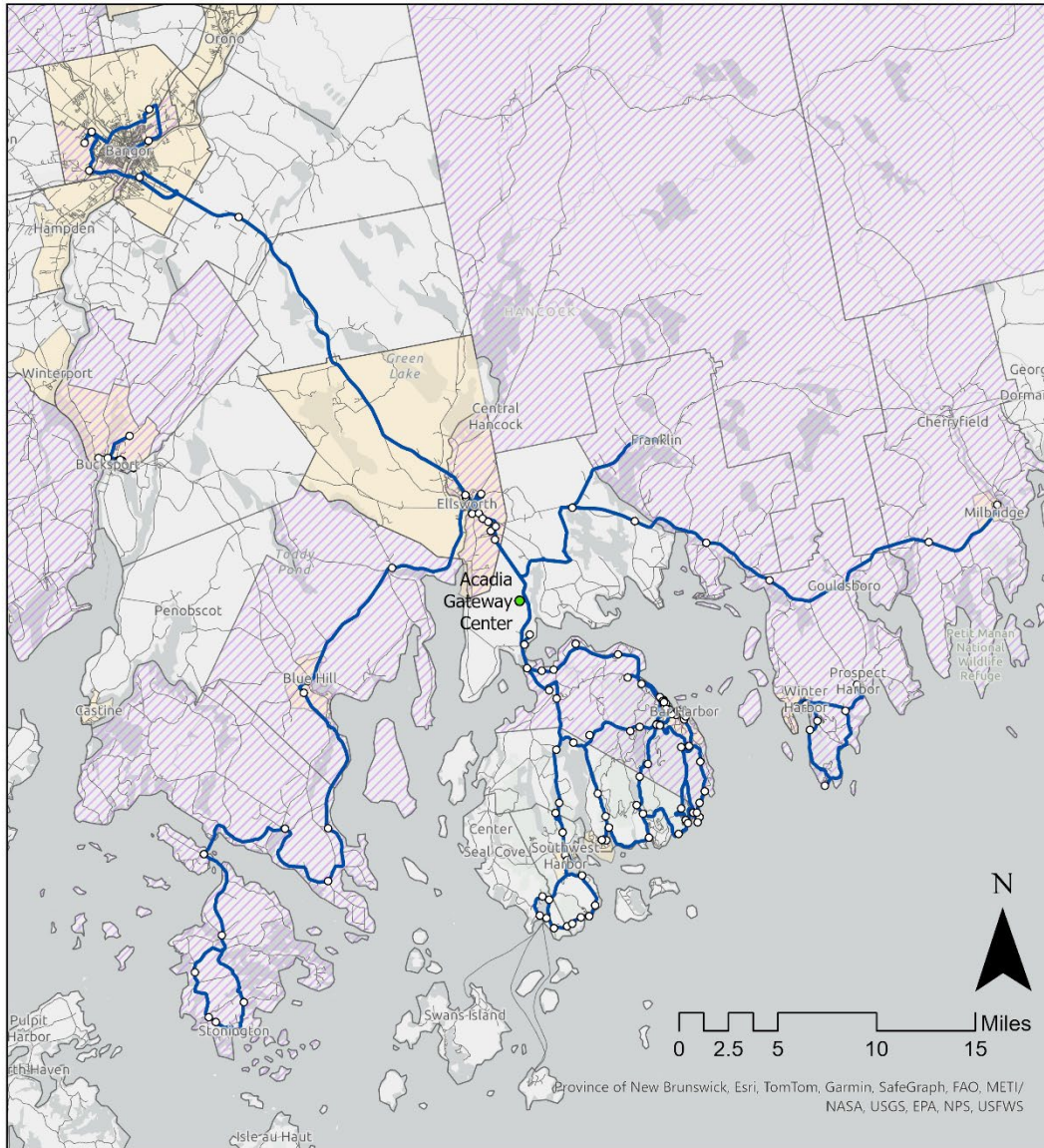
These safety benefits are especially critical given the service area's pronounced safety needs. The U.S. Department of Transportation's Equitable Transportation Community (ETC) Explorer shows a traffic fatality rate in one of the tracts of 28.95 per 100,000 people using an annual average between 2016-2020.² Two of the tracts within the area serviced by DTI are identified in the ETC as the 90th and 95th percentiles for insecurity of transportation safety. See Figure 5 and Table 3 below for information on ETC census tracts, census designated places, and ETC burdens for census tracts served by Downeast Transportation.

These buses will provide safe, reliable transit for residents and commuters throughout Hancock County.

² U.S. Dept. of Transportation's [Equitable Transportation Community \(ETC\) Explorer](#), accessed 1/18/2024.



Figure 1. Equitable Transportation Community Census Tracts



Legend

- DTI Bus Routes
- DTI Bus Stops
- ETC Census Tracts for Maine
- Public Roads
- Census Designated Places

ETC Tracts derived from Maine State ETC results, using the binary flnrk1 field.
 Data Sources: Maine Office of GIS, NPS, Downeast Transportation, Availtec, USDOT, US Census Bureau

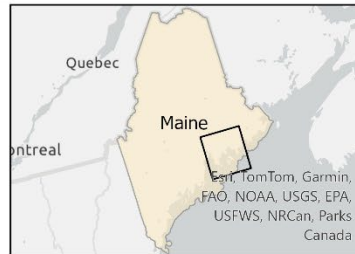




Table 3. Median ETC Burdens for Census Tracts Served by Downeast Transportation

Median ETC Burdens for Census Tracts Served by Downeast Transportation						
ETC-Measured Burdens	Transportation Insecurity	Health Vulnerability	Environmental Burden	Social Vulnerability	Climate and Disaster Risk	Final Percent Rank
Median for 11 DTI-Served ETC Tracts using Maine State Results (tract is overburdened if >65%)	79.625	65.625	10.125	63.5	71.625	83.875

Source: US Department of Transportation

1.2 CRITERION #2: ENVIRONMENTAL SUSTAINABILITY

This project will promote environmental sustainability of the greater coastal Maine ecosystem by incorporating consideration of environmental justice, reducing vehicle emissions in a Class I airshed including in eight disadvantaged community census tracts, and incorporates zero emission vehicle infrastructure.

This project will uphold national and State commitments to implement more sustainable and innovative transportation options. The project aligns with the U.S. National Blueprint for Transportation Decarbonization, including the goal to reduce greenhouse gas emissions produced by vehicles by switching to zero emission vehicles and implementing charging infrastructure.³

In 2019, Governor Janet Mills and the state legislature recognized the most pressing concern facing the state – climate change – and charted a path to immediately elevate the battle against it. As a result, the state created the Maine Climate Council (“Council”). The Council includes scientists, business leaders, bipartisan state and local lawmakers and concerned citizens, all collaborating to develop the state’s Climate Action Plan (“Plan”) titled *Maine Won’t Wait*.⁴ The comprehensive Plan details aggressive but achievable goals to combat climate change. In addition to this Four-Year Plan for Climate Action additional reports and initiatives have been undertaken to promote environmental sustainability that this project will advance:

- *“Maine Won’t Wait Progress Report, Maine Climate Council, December 2022”*⁵

³ [FACT SHEET: Biden Administration Advances Electric Vehicle Charging Infrastructure | The White House](#)

⁴ maine.gov/climateplan/sites/maine.gov.climateplan/files/inline-files/MaineWontWait_December2020_printable_12.1.20.pdf

⁵ [MWW Climate Plan Update December 2022 digital.pdf \(maine.gov\)](#)



- *Maine Clean Transportation Roadmap* authored by the Governor’s Energy Office and the Governor’s Office of Policy Innovation and the Future, December 2023⁶

This area of Maine periodically experiences high concentrations of a variety of air pollutants, primarily because of long-range transport by prevailing winds from large urban and industrial areas in states to the south and west.^{7 8} The ozone level is in the 90th to 99th percentile in much of the area serviced by DTI, and the diesel particulate matter level averages around the 30th percentile.⁹

The project prioritizes environmental justice considerations. Currently, DTI’s service is comprised of a mixed fleet of buses powered by diesel and propane. While the existing Island Explorer fleet is comprised of propane buses, DTI will leverage the battery-electric bus purchase to replace diesel buses on almost 80 percent of year-round service in disadvantaged communities. BEBs are quieter, do not emit particulate matter, and have substantially lower greenhouse gas emissions compared to diesel buses. Localized air pollution causes respiratory infections, lung disease, and other health issues. Integrating electric buses within DTI’s overall fleet is an essential step toward achieving emissions reduction goals. **The replacement of current buses with 23 BEBs is estimated to reduce particulate matter 2.5 (PM 2.5) emissions by 13.5 pounds and greenhouse gas emissions by 10,000 short tons over the lifetime of 15 years as compared to new propane busses.**

The NPS assessed the vulnerability of infrastructure along DTI’s routes to climate change and severe weather events estimated to 2050.¹⁰ The report concluded that three coastal roads within the park have high vulnerability under climate change scenarios. The bus system adds resiliency in the event of temporary road closures.

1.3 CRITERION #3: QUALITY OF LIFE

The project increases quality of life by creating affordable transportation choices for disadvantaged communities, expanding active transportation usage, and significantly reducing vehicle dependence.

⁶ [Maine Clean Transportation Roadmap - Dec2021](#)

⁷ Gawley W, Pizer B, Van Gorder J. Air quality monitoring at Acadia National Park. Poster. (2022)

⁸ Keiser D and Others. 2018. [Air pollution and visitation at U.S. national parks](#). Science Advances. 4(7):1-6

⁹ U.S. DOT’s ETC Explorer, accessed 1/19/2024.

¹⁰ Peek, K.; B. Tormey; H. Thompson; R. Young; S. Norton; J. McNamee; R. Scavo. March 2017. Acadia National Park Coastal Hazards & Climate Change Asset Vulnerability Assessment. NPS 123/154043. National Park Service, Washington DC.



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DTI operates across Hancock County, which has a population of nearly 57,000.¹¹ Almost 6,300 residents live below the poverty line and 8 percent of households do not own a vehicle.¹² 11 of the census tracts served by DTI have high levels of transportation insecurity, as defined by USDOT's ETC Explorer, due to factors such as transportation access, cost burden and traffic safety. This system reduces vehicle dependence and provides a safe, efficient, affordable, and reliable option for residents to get to daily destinations, including 45,000 jobs. DTI buses carry an average of 500,000 passengers annually that would have otherwise traveled by private automobile.¹³

Disadvantaged communities connected by the transit system include Bangor, Brewer, Franklin, Milbridge, Bucksport, and Stonington. Commuter buses connect these underserved communities to employment opportunities. The transit system provides a crucial service for households without vehicles, and those who may have a vehicle but cannot afford a long commute.

The transit system also provides an important transportation connection to Mount Desert Island, benefiting residents of Hancock County who work and recreate in and around Acadia National Park. While tourism is a major driver of the local economy, Mount Desert Island is also home to some of the largest employers in the area, including Jackson Laboratory, the Mount Desert Island Biological Laboratory, and the Mount Desert Island Hospital. There is a lack of affordable housing on Mount Desert Island, given escalating real estate prices and second home construction. This transit system is a critical connection to enable employees working on the island to reside in affordable housing on the mainland.

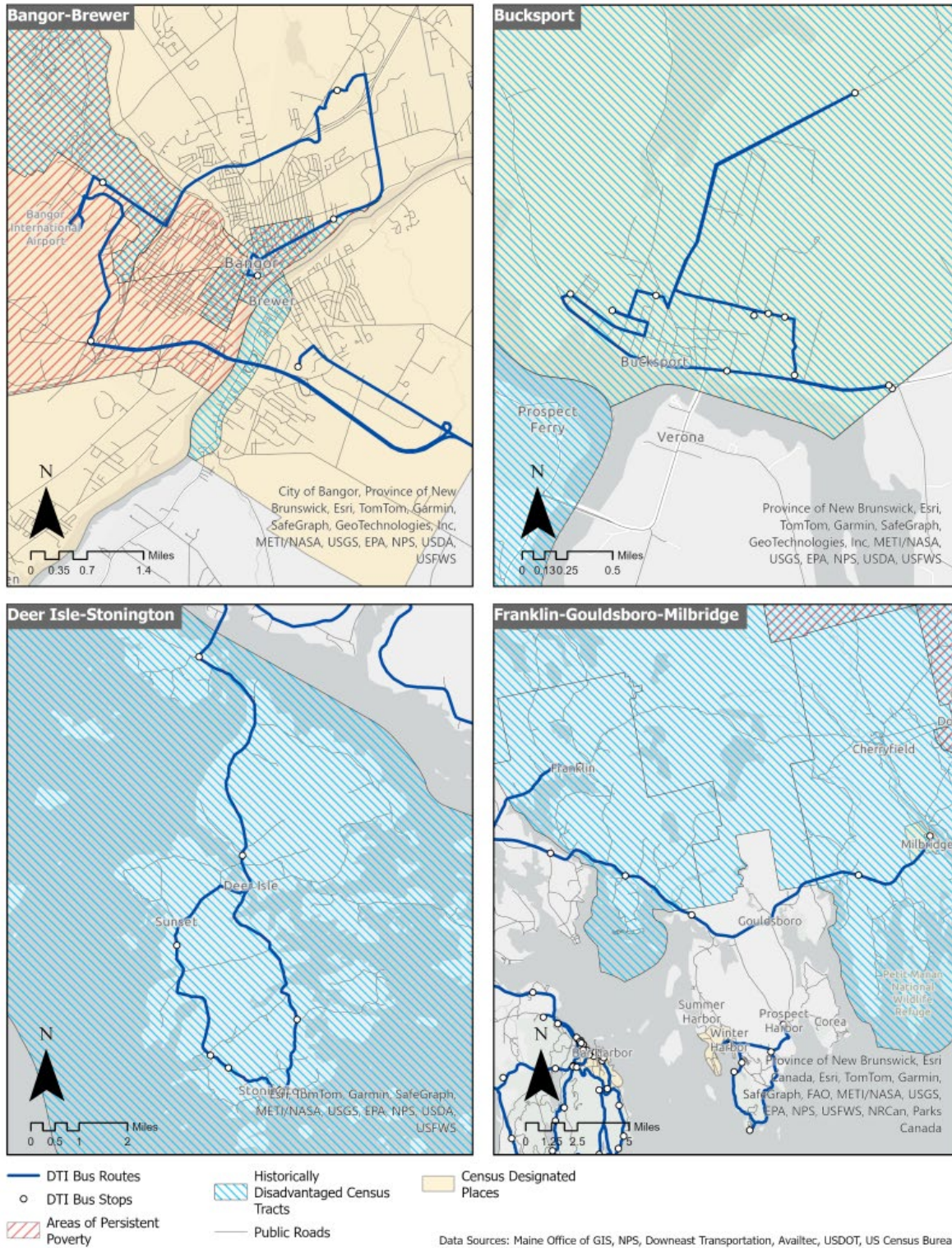
The project increases livability in the area by expanding active transportation options. Each bus will be equipped with a bicycle rack and the system provides key connections to the region's walkable main streets and extensive network of multiuse trails. These bike racks will also accommodate e-bikes allowing a wider range of access to/from the bus network. The system allows workers, residents, and tourists to access Mount Desert Island and Acadia National Park on the many days per year where there is a lack of parking for private vehicles.

¹¹ U.S. Census Bureau, [U.S. Census Bureau QuickFacts: Hancock County, Maine](#), accessed 1/18/2024.

¹² U.S. DOT's ETC Explorer, accessed 1/18/2024.

¹³ Downeast Transportation, Inc., ridership data 2014-2023, provided 1/17/2024.

Figure 2. Equity emphasis areas along the transportation network





1.4 CRITERION #4: MOBILITY AND COMMUNITY CONNECTIVITY

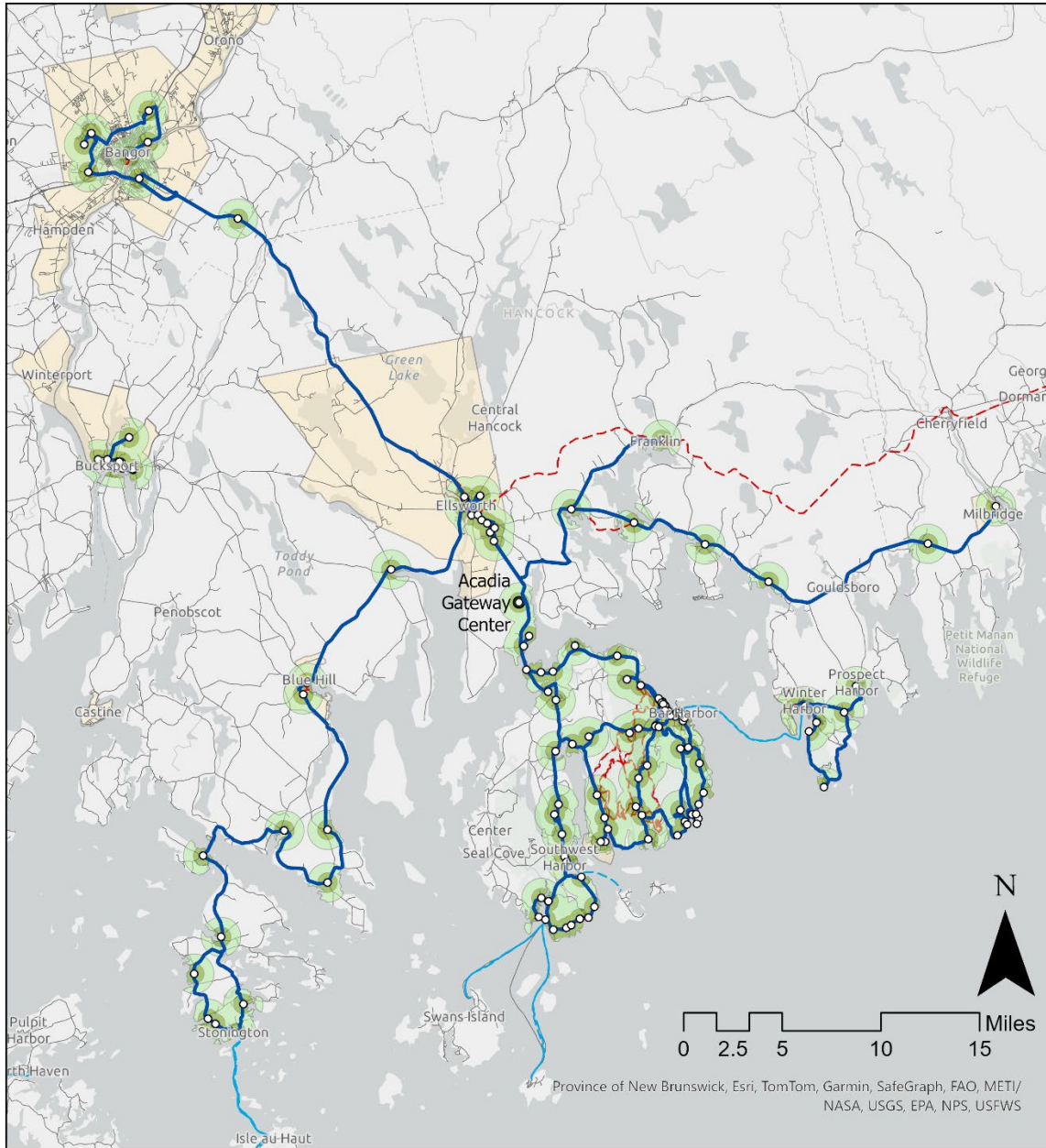
This project promotes mobility for residents by creating multimodal connections in communities throughout the region. This includes intermodal connections between transit, parking areas, ferries, and nonmotorized trails throughout the region including serving a new transit hub: Acadia Gateway Center. Using the new buses on the routes to/from the Acadia Gateway Center will allow DTI to maintain current headways while providing a seamless transfer point for the system at the transit hub.

Each bus will be fully accessible with chair lifts and equipped with bicycle racks that also accommodate e-bikes. Several routes provide service within one mile of approximately 45 miles of multi-use trails, creating protected, connected, and accessible connections to some of the most popular destinations in the state. They also serve four ferry terminals that provide vehicle and non-motorized access to the Schoodic Peninsula and five islands with resident populations.

This project will improve mobility for individuals who have mobility constraints, including those with disabilities and those who are 65 years of age or older. At a rider's request, buses can deviate from their route for up to three-quarters of a mile. The tracts within DTI's service area average in the 70th percentile for populations 65 and older, and one is in the 80th percentile for persons with disabilities.¹⁴

¹⁴ [US DOT Equitable Transportation Community \(ETC\) Explorer](#)

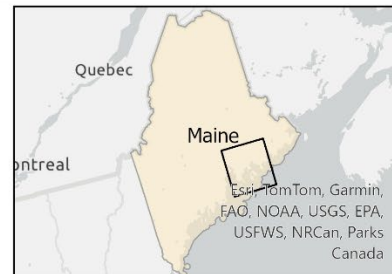
Figure 3. Project multimodal connections



Legend

- | | | |
|--|--|--|
| Distance to Stop (mi) |  DTI Bus Routes |  Census Designated Places |
|  0.25 |  DTI Bus Stops | |
|  0.5 |  Public Roads | |
|  1 |  Ferry Routes | |
| |  Multi-Use Trails | |

Data Sources: Maine Office of GIS, NPS, Downeast Transportation, Availtec, US Census Bureau, USDOT





1.5 CRITERION #5: ECONOMIC COMPETITIVENESS AND OPPORTUNITY

Tourism is the major economic driver of Maine’s Downeast and Acadia Region and this project will directly benefit the local economy. Not only do businesses generate revenue from tourism, but their employees also live in the local area and support the economy. Acadia National Park is one of the tourist destinations within DTI’s service area. According to NPS records, visitation to the park is growing rapidly and reached nearly 4 million visits in 2022. Visitors to the park in 2022 provided a total economic output of \$690 million, which supported nearly 7,000 private sector jobs.¹⁵

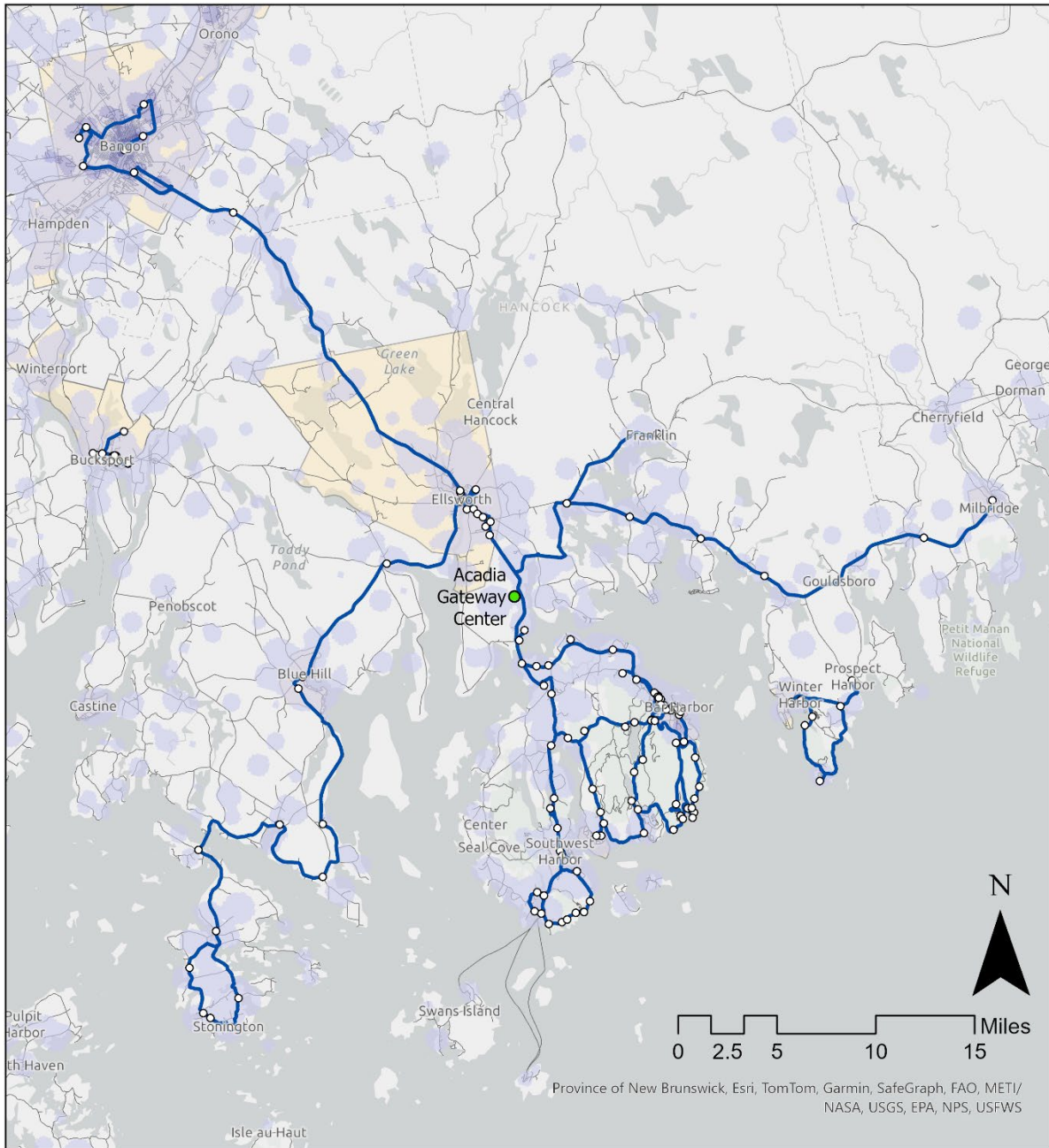
Tourism occurs year-round in Maine’s Downeast Acadia Region, but the area is particularly busy between May and October with visitation numbers during those months typically increasing by between 300,000 to 700,000.¹⁶ During those six months, traffic congestion and competition for parking is the norm within DTI’s service area. This project will help to reduce congestion in the park’s gateway communities, free up parking spaces and reduce road-side parking, which will allow more tourists to access iconic destinations, such as Bar Harbor and Acadia National Park. The additional two buses added to the fleet will run routes from the new Acadia Gateway Center in Trenton to Mount Desert Island, increasing the number of tourists arriving via multimodal transportation as the expanded fleet will reduce headways and expand capacity. This project enables commuters to get to their places of work on time, reliably, and with efficiency, and it allows residents to connect from their homes to businesses, services, and recreational opportunities with ease.

The new fleet will bolster the economy within the region by ensuring reliable access to workplaces, enabling more efficient commuting options for almost 20,000 workers and 45,000 jobs that are within a mile of the system’s approximately 140 stops (see Figure 8). This represents approximately 30 percent of the workers and 65 percent of the jobs in Hancock County.

¹⁵ Flyr, M., and L. Koontz. 2023. 2022 national park visitor spending effects: Economic contributions to local communities, states, and the nation. Natural Resource Report NPS/NRSS/EQD/NRR— 2023/2551. National Park Service, Fort Collins, Colorado. <https://doi.org/10.36967/2299764>

¹⁶[National Park Service Acadia National Park Visitors by Month](#)

Figure 4. Workers in the project area



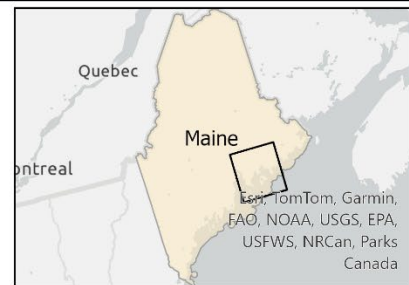
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Employment Density
(2021 LEHD)

- 5 - 1,323 Jobs/Sq.Mile
- 1,324 - 5,280 Jobs/Sq.Mile
- 5,281 - 11,874 Jobs/Sq.Mile
- 11,875 - 21,106 Jobs/Sq.Mile
- 21,107 - 32,976 Jobs/Sq.Mile

- DTI Bus Routes
- DTI Bus Stops
- Public Roads
- Census Designated Places

Data Sources: Maine Office of GIS, NPS, Downeast Transportation, Avaltec, US Census Bureau LEHD (2021)





1.6 CRITERION #6: STATE OF GOOD REPAIR

This project is primarily focused on bringing the existing transit fleet into a state of good repair. This investment will **reduce annual fuel costs for DTI’s transit fleet by more than \$170,000 and operations and maintenance costs by \$600,000**. The current transit vehicles will exceed their expected service life in 2026. The fleet has high service mileage, declining engine condition, and escalating maintenance costs (See Benefit-Cost Analysis Narrative). Without outside funding, DTI will be forced to keep these vehicles in service, and DTI and its partners will need to make costly repairs to the existing propane-powered fleet to keep the system operational. These buses are no longer manufactured by the private sector and parts are in short supply.

The new vehicles have an expected service life of 10 years. Switching to battery-electric technology mitigates the potential for variability in the price of fuel. Routine repairs are becoming increasingly time-consuming, impacting service reliability, and drawing on limited resources. While the upfront replacement cost of BEBs are higher than other vehicles on the market, **DTI and its partners will realize significant savings over long term operation of the vehicles** (see Benefit-Cost Analysis Narrative).

1.7 CRITERION #7: PARTNERSHIP AND COLLABORATION

This project exemplifies a multi-jurisdictional effort among numerous public and private partners throughout rural Downeast Maine, and is supported by disadvantaged communities like Bangor, Bucksport, Stonington, Brewer, Franklin, and Milbridge. This project will capitalize on a strong partnership between the State of Maine and Downeast Transportation Inc.–the official, non-profit transit agency serving Hancock County. This service is supported by municipal governments, private and non-profit entities, and the National Park Service, which enthusiastically support the modernization and expansion of regional transit service (see Letters of Support).

DTI engages diverse people and communities, including community organizations like Acadia Healthy Communities, Bucksport Health Communities, and the Eastern Agency on Aging, who largely serve older adults and populations with disabilities. DTI also supports and engages with the economic development and business community, including Chambers of Commerce, real estate developers, Island Housing Trust (focused on first time homeowners and work force housing), municipal governments, and employers to help plan residential and commercial development as well as workforce transportation. This includes partnerships with high-quality workforce development programs like the Jackson Laboratory, which is the region’s largest employer. The Jackson Laboratory’s partnership with DTI is the state’s most successful commuter program, carrying workers from underserved communities to well-paying jobs with excellent benefits.



Based on the strong foundation of high-quality workforce development programs offered through Maine’s Community College System, DTI has engaged with Eastern Maine Community College (EMCC) and Washington County Community College (WCCC) to explore potential partnership opportunities if awarded the grant to leverage existing electric vehicle maintenance and electrical technician training and apprenticeship programs. Additionally, both EMCC and WCCC can provide partnership opportunities for training drivers to obtain their Commercial Driver’s License with Passenger endorsement to maximize DTI’s opportunities to maintain a qualified pool of drivers. The flexibility offered by EMCC and WCCC in their available training programs offers additional support to DTI in providing the maintenance and operations if awarded the grant.

While MaineDOT is the lead applicant, DTI, the National Park Service, and Friends of Acadia are contributing technical, financial, and staff resources. Overall, the project will facilitate extensive coordination across multiple public and private entities, including federal, state, county, municipal agencies, and business interests, including, but not limited to:

- Hancock County,
- 17 municipal governments,
- National Park Service,
- The Jackson Laboratory,
- L.L. Bean, and
- Friends of Acadia.



1.8 CRITERION #8: INNOVATION

Innovative Technologies

DTI began bus operations in 1999, using primarily propane powered buses, which were innovative at that time. These buses had a dramatically lower emissions footprint than standard diesel-powered units on the market and significantly mitigated potential emissions. Continuing this leadership in innovative fuel technology, this project will deploy cutting-edge battery electric buses with zero tailpipe emissions and less energy costs than petroleum-powered units. The buses will be equipped with robust information technology systems, including real time vehicle location, public real-time arrivals (using the general transit feed specification), automated passenger counters, voice and text stop announcements, GPS, radios, etc.

DTI and private manufacturers piloted battery-electric buses in 2023. The partners used experience from these tests to scope this proposed project, including vehicle types, charging station capacity, and configuration. The fleet will feature innovative solutions that improve safety, increase performance, and reduce electrical demand (and associated costs) for charging the fleet; achieved through latest-generation battery chemistry, driveline equipment calibrated and optimized for local conditions, and an intelligent charge management system.

Innovative Project Delivery

The project will utilize innovative procurement and project delivery practices, including best value procurement, to streamline project implementation. As a general practice, MaineDOT follows Maine Division of Procurement Services rules for procuring transit vehicles and infrastructure with federal funds. MaineDOT procurement and project management staff will work with the interested parties to expedite this process.

Innovative Financing

MaineDOT and DTI will use a mix of traditional and non-traditional funding sources for the RAISE capital grant match and to fund the long-term operation of the buses. The grant will utilize a mix of National Park Service and private funds. Most of DTI's routes are fare-free. Instead of farebox recovery, DTI relies on a mix of six major funding sources for operations, including contributions from MaineDOT (Federal Transit Administration 5311 formula funds), National Park Service entrance fees, municipal contributions, philanthropic support, business direct service, and on-board donations.