



LEWISTON-AUBURN HIGH LEVEL ALTERNATIVES ANALYSIS

Bus Alternative

January 2023

PREPARED BY



IN ASSOCIATION WITH



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1

INTRODUCTION

1.1 Project History and Purpose

Since 1997, ongoing studies have been completed analyzing the potential implementation of passenger rail service in Lewiston-Auburn. In 2018, a *Lewiston Auburn Passenger Rail Service Plan: Transit Propensity Report* analyzed ridership potential from passenger rail service between Lewiston- Auburn and Portland Maine.¹ In 2019, a *Lewiston-Auburn Passenger Rail Service Plan: Operating Plans and Corridor Assessments* was completed, examining potential service alternatives and corridor considerations for commuter rail service between Lewiston-Auburn and Portland.² Here, commuter bus service from Lewiston-Auburn to Portland, Maine is evaluated as an alternative to potential commuter/passenger rail service as part of the high level alternatives analysis as directed in LD 991

¹ Lewiston Auburn Passenger Rail Service Plan: Transit Propensity Report, 2018 <https://www.nnepra.com/wp-content/uploads/2020/06/Lewiston-Auburn-Passenger-Rail-Service-Plan-Transit-Propensity-Report.pdf>

² Lewiston Auburn Passenger Rail Service Plan: Operating Plans and Corridor Assessments, 2019 <https://www.nnepra.com/wp-content/uploads/2020/06/Final Phase 2 L-A Report with Appendices.pdf>

1.1.1 2018 Lewiston-Auburn Passenger Rail Service Plan: Transit Propensity

In 2018, a *Lewiston Auburn Transit Propensity Report* was completed to examine potential ridership for passenger rail service to Portland Maine from Lewiston-Auburn. This study did not analyze commuter bus service as an alternative to passenger rail services. The only discussion of bus service was the benefits to improvements to “first mile and last mile” bus connections from passenger rail service.

1.1.2 2019 Lewiston-Auburn Passenger Rail Service Plan: Operating Plans and Corridor Assessments

The 2019 *Operating Plans and Corridor Assessments* report did not analyze a commuter bus alternative to rail. The study only determined that Bus Rapid Transit would not be an appropriate mode due to its inability to operate on pre-existing railroad tracks. The report does however mention that bus service could be considered as a standalone alignment that operates on an interstate or regional highway. The purpose of this report is to further analyze this as an alternative for comparison. Evaluation and documentation of all alternatives and modes is a prerequisite for pursuit of federal funds, should MaineDOT pursue federal grant funding for capital costs.

1.1.3 Report Purpose

This report examines potential routes, stops, operational costs, travel times, and vehicles needed for commuter bus service from Lewiston-Auburn to Portland. A performance metrics matrix is included in this study to provide a baseline for future consideration. The purpose of this report is not to recommend a particular alternative but rather inform and help guide future analysis. To move forward with any next steps, all alternatives must be considered, analyzed, and documented moving forward.

2

EXISTING CONDITONS

2.1 Existing Commuter Bus Service

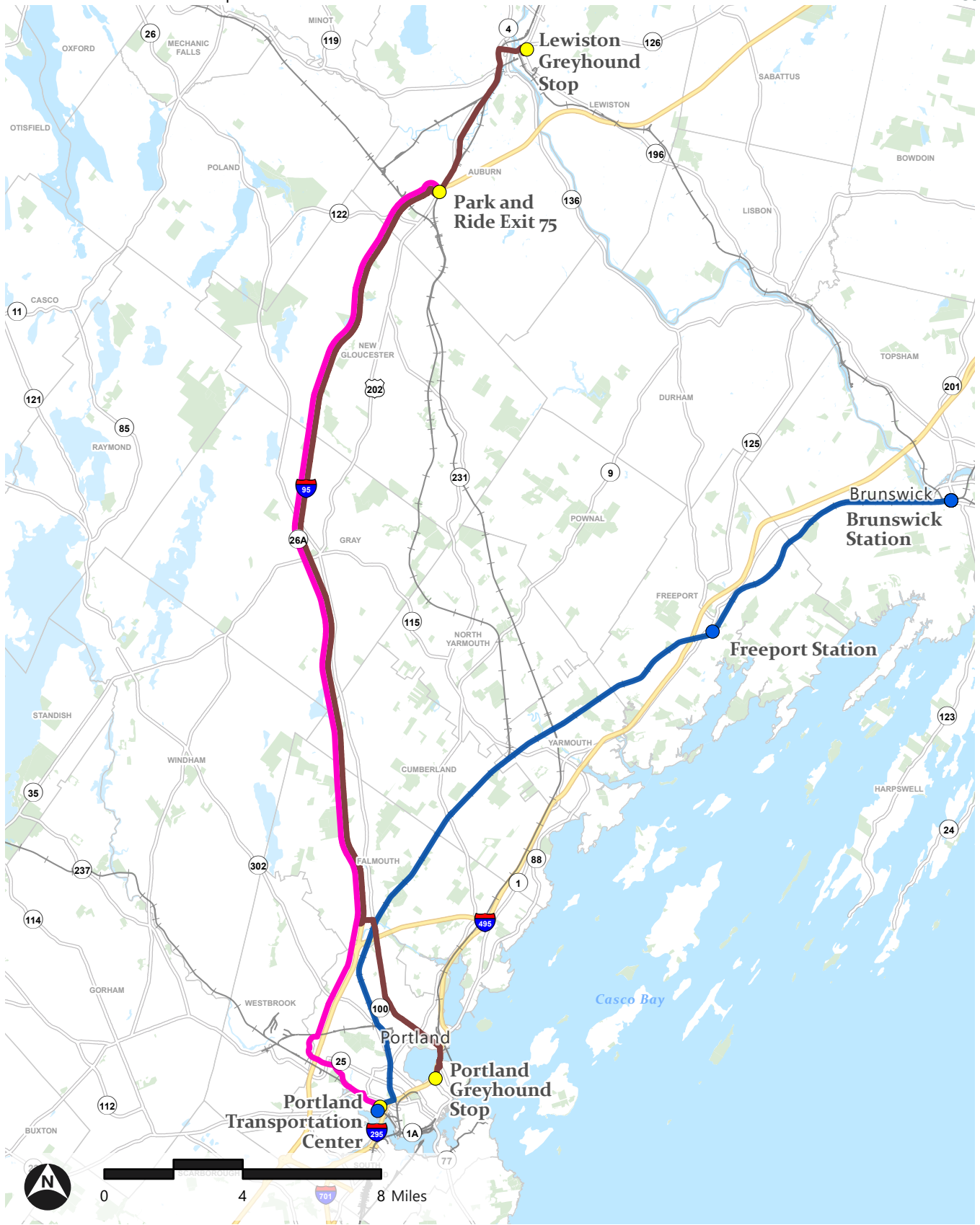
Lewiston and Auburn currently have two existing, privately operated bus services to Portland, Concord Coach Line, and a Greyhound Bus Line. Both bus services have approximately forty-five minutes to one hour ride times. The routes for each line can be seen in Figure 1. There is also a local bus system called Citylink serving Lewiston and Auburn that provide connections to the express service. A map of Citylink is seen in Figure 2.

The Concord Coach Line has three existing bus stops in Lewiston and Auburn. One stop is a park and ride facility accessible from Exit 75 that provides bus service to Portland via I-95. This stop is currently the only year-round in-service Concord Coach bus stop for the area. Located in Lewiston on the Bates College campus, the second stop is in-service for nine months during the college's academic year. The third stop is the Downton Auburn Transportation Center which is closed indefinitely. Ticket prices for Concord Coach Line cost on average \$11 one way.

The Greyhound Bus Line has one stop in downtown Lewiston at the Oak Street Station. This route travels to Portland via I-95. The Greyhound Bus drops riders at a park and ride facility in Portland via I-295. Ticket prices on the Greyhound Line range from \$15 to \$20 one way.

Citylink is Lewiston and Auburn's regional bus system. Citylink has ten bus routes connecting both cities. All the stops mentioned above, except for Concord Coach Lines park and ride facility off Exit 75, are also stops on the Citylink bus system. Figure 2 shows the ten bus routes and two bus stops mentioned above. The Oak Grove Station provides Greyhound Bus service for Lewiston. The Downtown Auburn Transportation Center was a connector for Citylink and the Concord Coach Line but is now closed indefinitely.

Figure 1: Existing Conditions Map
 PLA Economic Evaluation | Maine

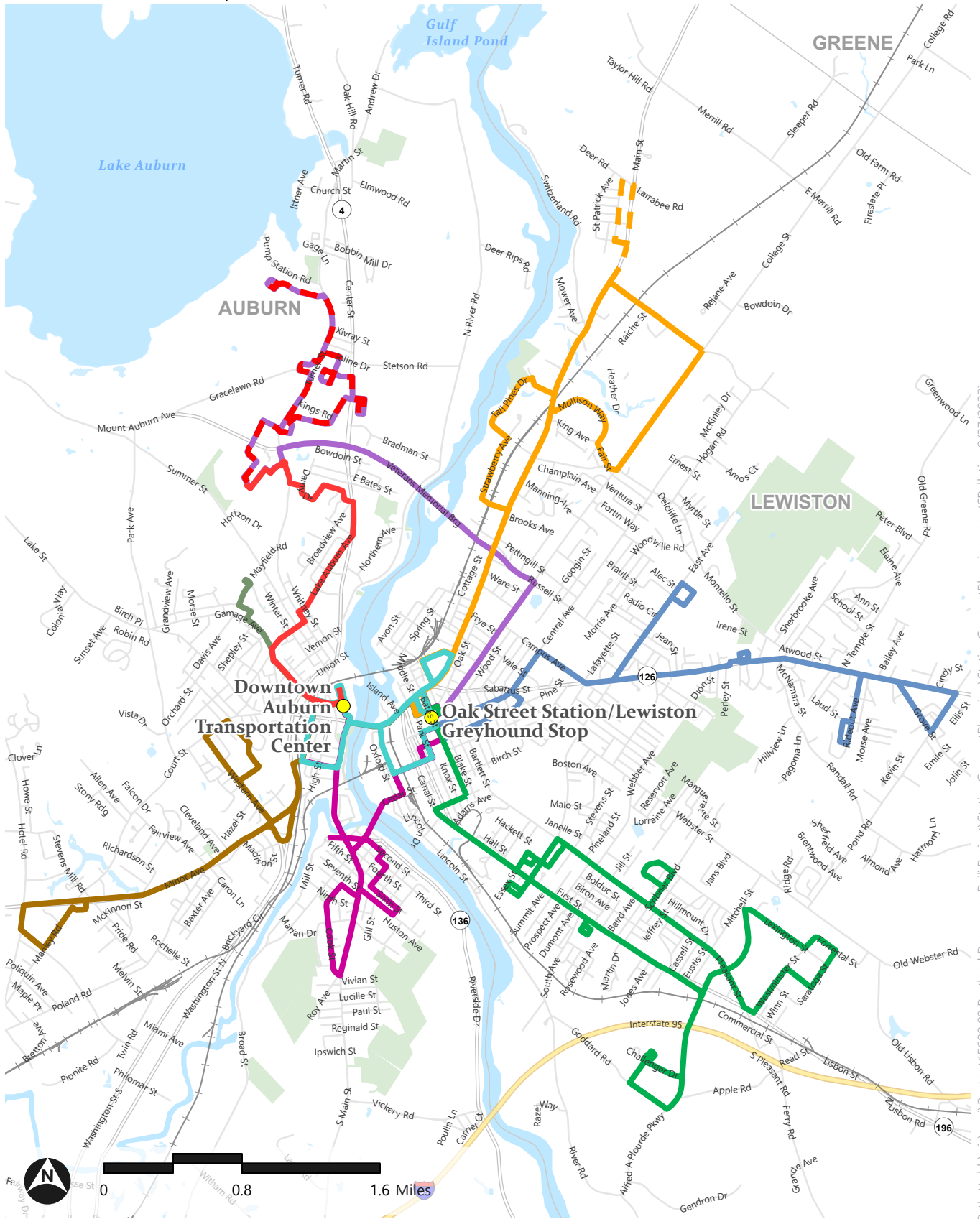


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- | | | |
|--------------------|--------------------|--------------------|
| Bus Stop Location | Downeaster Station | Conservation Lands |
| Concord Coach Line | Railroad | Town Boundaries |
| Greyhound Route | Interstate Route | |
| Downeaster Service | Secondary Route | |

Source: MEGIS

Figure 2: CityLink Bus Routes
PLA Economic Evaluation | Maine



- Bus Stop Location
- citylink Bus Routes
- Auburn Malls
- College Street
- Downtown Shuttle
- Lisbon Street
- Main Street
- Main Street Extension
- Mall Shuttle
- Minot Avenue
- New Auburn
- Sabattus Street
- Pettengill Park

Source: MEGIS, citylink

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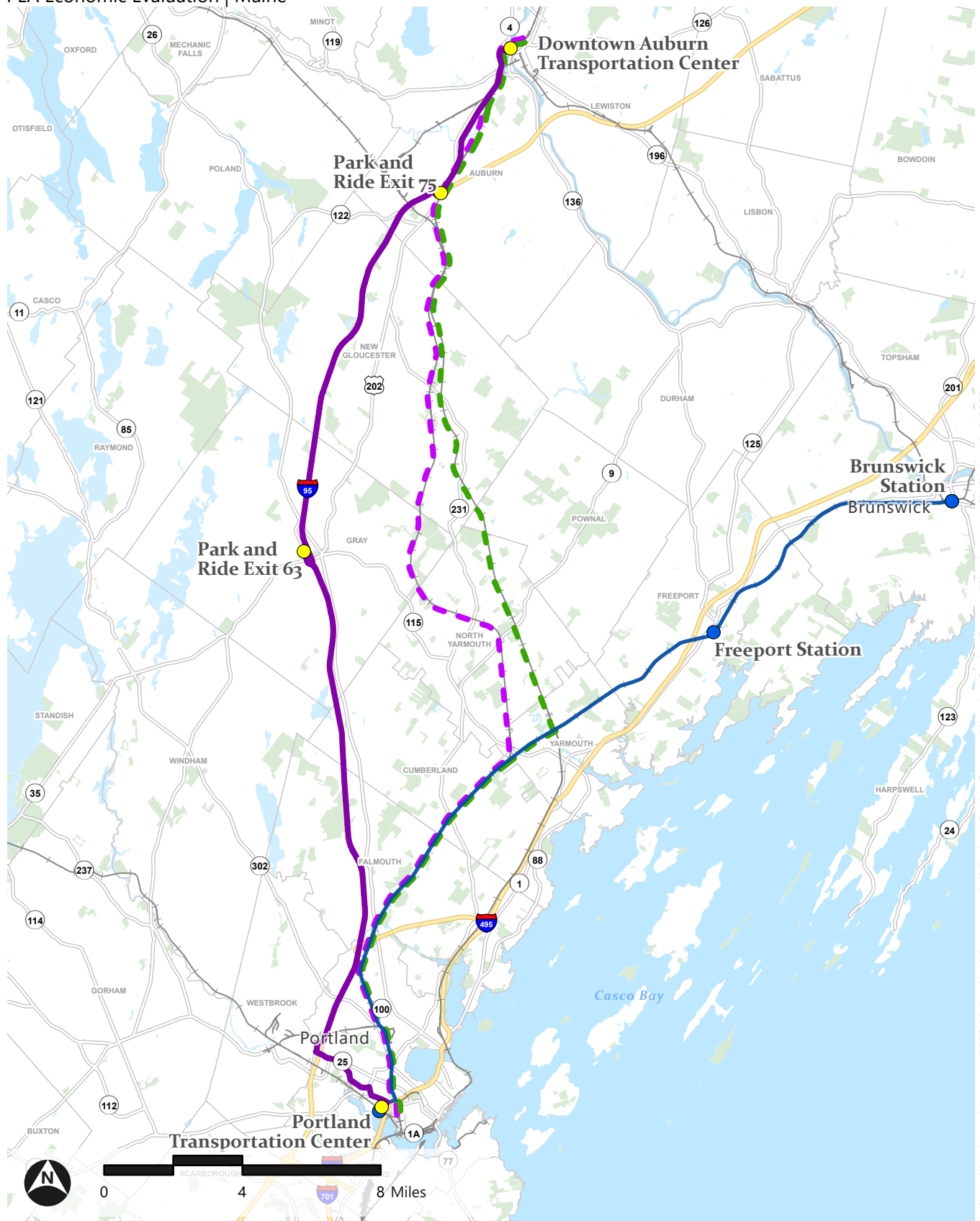
3

BUS CONNECTION ALTERNATIVE

Three potential bus routes have been identified to serve as a potential commuter bus route from Lewiston-Auburn to Portland. All three routes begin service at the Downtown Auburn Transportation Center and end service at the Portland Transportation Center. These routes provide similar service as the potential rail alternatives discussed in the 2019 *Operating Plans and Corridor Assessments* report.

- ▶ Shown in Figure 3, Route B.1 provides express service from the Downtown Auburn Transportation Center to the Portland Transportation Center via I95 with a stop at the Exit 75 Park and Ride in Auburn and the Exit 63 Park and Ride in Gray, ME.
- ▶ Route B.2, shown in Figure 4, also provides express service from the Downtown Auburn Transportation Center to the Portland Transportation Center with a stop at Exit 75 Park and Ride and the Exit 63 Park and Ride, then travels down Route 202 and then I95 after the Exit 63 Park and Ride.
- ▶ Route B.3 takes the coastal route with service from the Downtown Auburn Transportation Center to the Portland Transportation Center with a stop at the Exit 15 Park and Ride in Yarmouth, ME. Shown in Figure 5, Route B.2 travels down Route 136 to I-295

Figure 3: Route B.1
 PLA Economic Evaluation | Maine

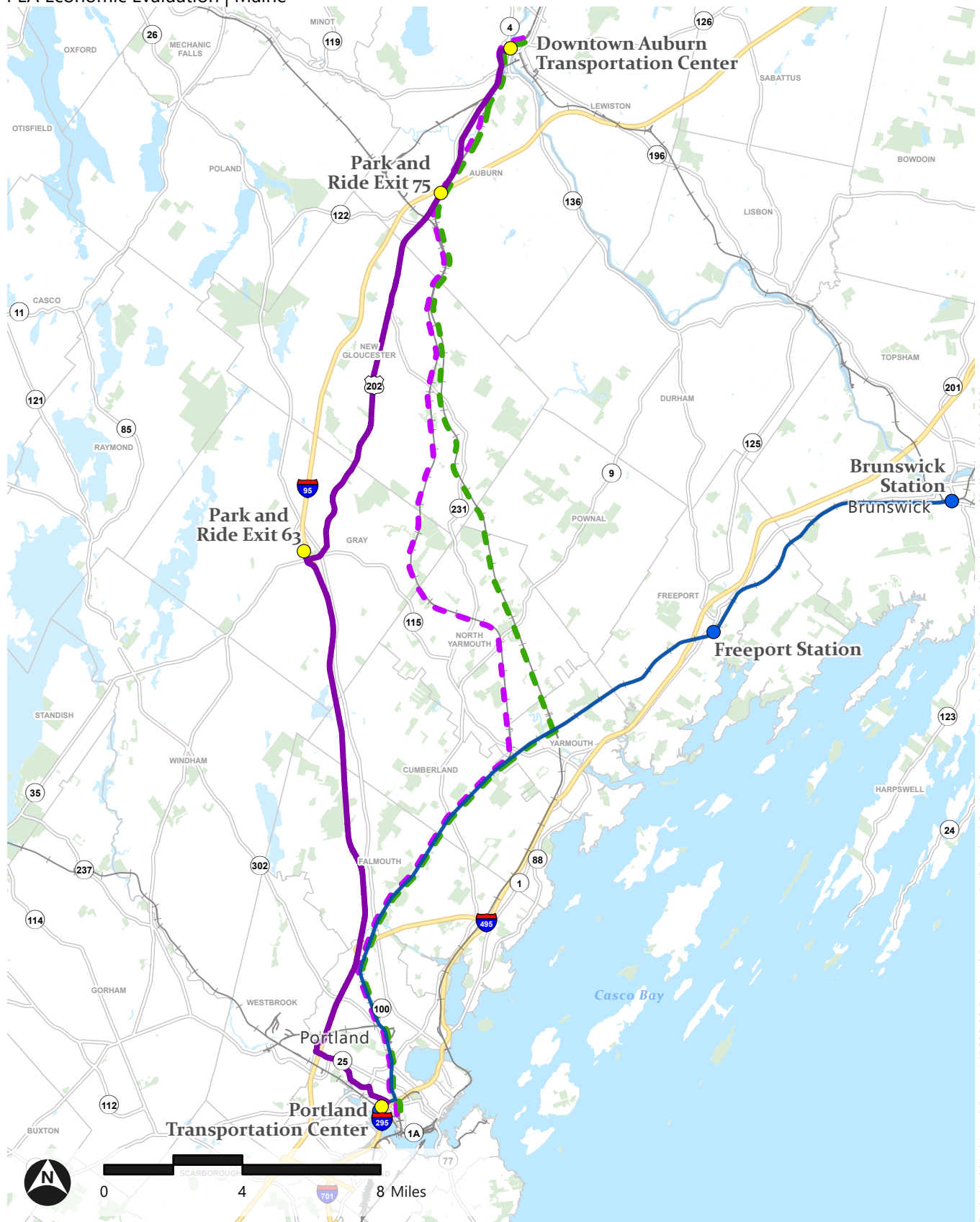


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- Potential Bus Stop Location
- Downeaster Station
- Conservation Lands
- Town Boundaries
- Route B.1
- Downeaster Service
- - Rail Alternative 1B
- - Rail Alternative 1A
- Railroad
- Interstate Route
- Secondary Route
- NHD Waterbody

Source: MEGIS

Figure 4: Route B.2
PLA Economic Evaluation | Maine

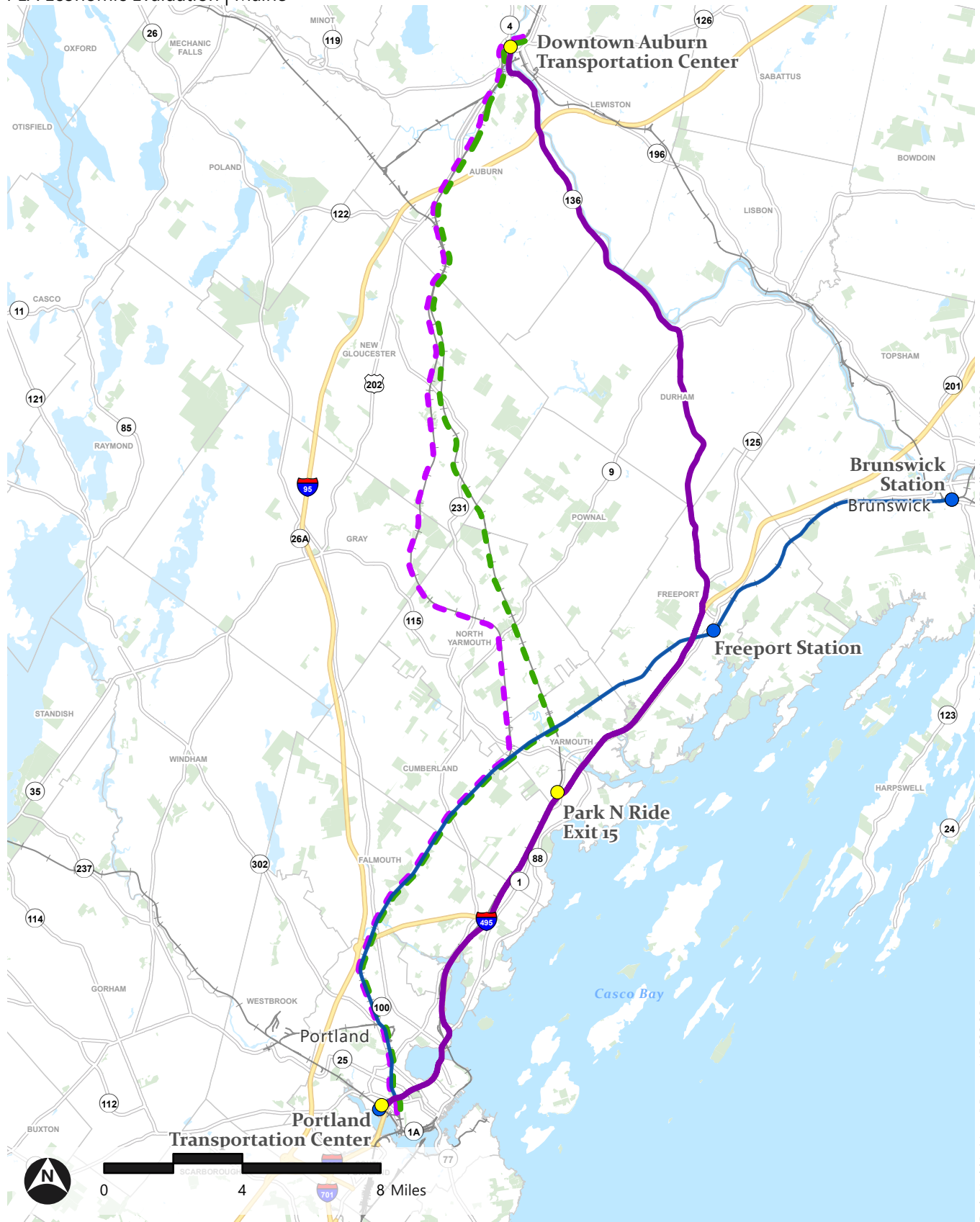


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- Potential Bus Stop Location
- Downeaster Station
- Conservation Lands
- Route B.2
- Downeaster Service
- Town Boundaries
- Rail Alternative 1B
- Rail Alternative 1A
- Railroad
- NHDWaterbody
- Interstate Route
- Secondary Route

Source: MEGIS

Figure 5: Route B.3
 PLA Economic Evaluation | Maine



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- Potential Bus Stop Location
- Downeaster Station
- Route B.3
- Downeaster Service
- Rail Alternative 1B
- Rail Alternative 1A
- Conservation Lands
- Town Boundaries
- NHD Waterbody
- Interstate Route
- Railroad
- Secondary Route

Source: MEGIS

All three bus route alternatives could potentially serve as interim bus service during planning, design, and construction of a commuter rail service. This type of commuter bus service could also assist in measuring and verifying transit demand in the corridor. However, this report analyzes bus service as an alternative to rail service.

3.1.1 Service Plan

The following section details preliminary service frequency, estimated travel times, and estimated operational costs. High frequency (12 and 20 round trips per day) and low frequency (4 round trips per day) service plans have been analyzed for all three bus routes. Further analysis will need to be completed to determine a final operation schedule. Bus service will likely be provided on weekdays from 5 AM to 10:30 PM. Peak service with a 30-minute headway will be provided during rush hour periods from 7 to 9 AM and 4 to 6 PM. To operate with a 30-minute headway during peak service all routes will need 4 vehicles to operate at full capacity. Round trip ticket prices for comparison purposes will range from \$12 to \$20 comparable to the potential ticket price of the passenger/commuter rail service and current prices for bus service.

3.1.1.1 Estimated Travel Times

The table below details the estimated roundtrip travel times and distances of the three potential bus route alternatives. Five minutes have been added to each route to account for potential traffic and dwell times.

Table 1. Travel Times and Distance of Potential Bus Routes

Route	Route Miles (roundtrip)	Total Travel Time in hours (roundtrip)
Route B.1	73.6 miles	2.0 hours
Route B.2	72.0 miles	2.2 hours
Route B.3	75.0 miles	1.8 hours

3.1.1.2 Operating Costs

In FY2020, the average operating cost for commuter bus agencies across the Northeast region was \$2,076,158.³ Operating costs for each route are broken down into three different scenarios represent

ing different levels of service; 4 roundtrips, 12 roundtrips, and 20 roundtrips. Tables 2-4 show operating expenses calculated using both FY2020 average commuter bus operating

expense per revenue mile and per revenue hour for the New England region.⁴ The average operating expenses across the New England region per revenue miles is \$4.58 and per revenue hours is \$130.00. All scenarios assume commuter bus service would operate on weekdays (260 days a year).

Table 2. Scenario 1 (4 round trips)

	Operating Expense (Revenue mile)	Operating Expense (Revenue Hour)
Route B.1	\$399,700	\$308,300
Route B.2	\$391,000	\$334,000
Route B.3	\$407,300	\$282,600

Table 3. Scenario 2 (12 round trips)

	Operating Expense (Revenue mile)	Operating Expense (Revenue Hour)
Route B.1	\$1,199,000	\$924,800
Route B.2	\$1,172,900	\$1,001,800
Route B.3	\$1,221,800	\$847,700

Table 4. Scenario 3 (20 round trips)

	Operating Expense (Revenue mile)	Operating Expense (Revenue Hour)
Route B.1	\$1,988,300	\$1,541,300
Route B.2	\$1,954,800	\$1,669,700
Route B.3	\$2,036,300	\$1,412,800

⁴ To account for inflation the estimated operating expenses have been increased by 1.14%. This increase represents the inflation change between July 2020 and July 2022 estimated by the Bureau of Labor Statistics CPI Inflation Calculator. [CPI Inflation Calculator \(bls.gov\)](https://www.bls.gov/calculators/cpi-inflation-calculator)

4

PERFORMANCE METRICS EVALUATED

4.1 Introduction

This chapter summarizes the performance metrics evaluated for each potential bus route. This report does not make recommendations on a preferred route, the following evaluation metrics are informational and can be used to aid future considerations.

4.2 Evaluation Criteria

Route B.1, B.2, and B.3 were evaluated based on mobility, environmental metrics, cost metrics, and an implementation timeframe. The following section explains the thresholds used to evaluate each metric. If applicable, metrics were evaluated using a low-medium-high rating system in line with metrics evaluated for rail alternatives.

4.2.1 Mobility Metrics

The seven-mobility metrics evaluate the operating characteristics of each bus route. This measure serves to inform how commuter bus service may benefit future riders.

4.2.1.1 Metric 1.1 Estimated end-to-end travel time from Lewiston to Portland

End-to-End travel time from Lewiston-Auburn to Portland was estimated using Google maps. This estimation includes 5 extra minutes for each route to buffer in dwell times, and potential traffic. Comparing the approximate cost of driving versus bus fare is a key factor in understanding the potential benefits of a commuter bus service. The approximate cost for commuters driving down the Maine Turnpike is \$23.48 roundtrip compared to the range of \$12-\$20 commuter bus ticket prices.⁵ The thresholds used to evaluate end-to-end travel times are:

High	End-to-end travel time is in the lower end of comparable drive time range
Medium	End-to-end travel time is in the middle end of comparable drive time range
Low	End-to-end travel time is in the high end of comparable drive time range

4.2.1.2 Metric 1.2 Number of transfers required for end-to-end trips

This metric looks at whether transfers are required to complete a trip from Lewiston-Auburn to Portland. There are no transfers required for each route. The thresholds used are:

High	No transfers required
Low	Transfers are required

⁵ The calculation for private vehicles traveling down the Maine Turnpike assumes the toll cost to be \$2, the average fuel economy of a vehicle is 25 miles per gallon with the average Maine gas price being \$3.7 per gallon, and the average parking cost in Portland for 8 hours to be \$16. Average parking cost was calculated using information from <https://www.portland.gov/transportation/parking/parking-guide>.

4.2.1.3 Metric 1.3 Peak Frequency

This metric refers to how often a vehicle will arrive in peak hours. It is assumed each route will operate at a 30-minute headway during peak service hours. The threshold used to evaluate peak frequency:

High	Service is provided at intervals of 30 minutes or less
Medium	Service is provided at intervals of between 30 to 60 minutes
Low	One trip or less is provided in the peak period

4.2.1.4 Metric 1.4 Off-Peak frequency

This metric refers to how frequently vehicles will arrive in off-peak hours. It is assumed in off-peak hours buses will reduce service to one bus, meaning each off-peak headway equals the roundtrip travel time. The thresholds used to evaluate off-peak frequency are:

High	Service is provided at intervals of 90 minutes or less
Medium	Service is provided at intervals of between 90 and 180 minutes
Low	Service is provided at intervals of 180 minutes or more

4.2.1.5 Metric 1.5 Estimated Reliability

A reliable transit trips has consistent and scheduled arrival/departure times. The thresholds used to evaluate this metric are:

High	Service is operated on an exclusive right-of-way not shared with competing service
Medium	Service does not operate on an exclusive right-of-way
Low	Service operates on a shared right-of-way, and/or requires a transfer

4.2.1.6 Metric 1.6 Ridership Potential

While this project has not developed ridership estimates specific to commuter bus service, some assumptions have been made comparing commuter bus ridership to assumptions of rail ridership made in the 2018 *Transit Propensity Report*.⁶ Travel times are estimated to be longer for some bus service alternatives than rail service making bus service less attractive to customers. Commuter bus service will not drive transit-oriented development (TOD) like rail service, so projected future ridership for commuter bus service will be lower. Riders on commuter bus service are more likely to be transit dependent. There are also pre-existing private carriers that would compete with this bus service. The price of commuter bus fares will be a driving factor for potential ridership. Thresholds used to evaluate this metric are:

High	Ridership is projected to be higher than potential rail ridership
Medium	Ridership is projected to be similar to projected rail ridership
Low	Ridership is projected to be lower than potential rail ridership

4.2.1.7 Metric 1.7 Transfer location to connect to the Downeaster to continue to Boston

This metric analyzes the ability to connect to other regional services. All routes end at the Portland Transportation Center which provides direct transfer to Downeaster Service to Boston. The thresholds used to evaluate this metric are:

High	Transfer can be completed at an existing Downeaster station
Low	Transfer would require construction of a new Downeaster station

⁶ Lewiston-Auburn Passenger Rail Service Plan: Transit Propensity Report, 2018 [L-A-Passenger-Rail-Service-Plan-Transit-Propensity-Report-August-2018-PDF \(avcog.org\)](#)

Table 5. Mobility Metrics Evaluation

Evaluation Criteria	Route B.1	Route B.2	Route B.3
Mobility			
Metric 1.1: Estimated end-to-end travel time from Lewiston to Portland	1 hour	1 hour 10 min.	55 min.
Metric 1.2: Number of transfers required for end-to-end trips (Portland to L-A)	None	None	None
Metric 1.3: Peak frequency (time between successive transit vehicles)	30 minutes	30 minutes	30 minutes
Metric 1.4: Off-peak frequency	120 minutes	132 minutes	108 minutes
Metric 1.5: Estimated reliability	Moderate	Moderate	Moderate
Metric 1.6: Ridership potential	Lower ridership potential	Lower ridership potential	Lower ridership potential
Metric 1.7: Transfer location to connect to the Downeaster to continue on to Boston	Transfer can be completed at the Portland Transportation Center	Transfer can be completed at the Portland Transportation Center	Transfer can be completed at the Portland Transportation Center

Legend:

	High Ranking
	Medium Ranking
	Low Ranking

4.2.2 Environmental Metrics

The metrics in this section intend to measure the potential environmental impacts of each commuter bus route. A more thorough environmental analysis will be required in the future should a commuter bus alternative be progressed.

4.2.2.1 Metric 2.1 Potential for increased air emissions

This metric measures the potential impact commuter bus service would have on air emissions. The thresholds used to evaluate potential air emissions are:

High	Negligible potential impact due to no increased operations
Medium	Moderate impact due to increased operations
Low	Potential impact due to increased operations

4.2.2.2 Metric 2.2 Potential impact to impaired water bodies

Impaired bodies of water are those that fail to meet one or more water quality standards. The thresholds used to evaluate potential impact to water bodies are:

High	No anticipated impact
Medium	Potential impact to one impaired water body
Low	Potential impact to more than one impaired water body

4.2.2.3 Metric 2.3 Potential impact to non-impaired water bodies

Non-impaired water bodies are those that meet water quality standards but are at risk of being impacted by development. The thresholds used to evaluate this metric are:

High	Potential impacts to 5 or less water bodies
Medium	Potential impact to 5 to 10 water bodies
Low	Potential impact to 10 or more water bodies

4.2.2.4 Metric 2.4 Potential environmental justice impacts

Environmental justice is the fair treatment of all people regardless of race, color, national origin, or income. This metric is evaluated using the thresholds of:

High	No anticipated impact
Medium	Potential impact to minority populations
Low	Potential impact to minority and low-income populations

4.2.2.5 Metric 2.5 Anticipated consultation and permitting effort

Although there is no anticipated construction at this time, the implementation of commuter bus service will be federally funded. Any federally funded project is required to comply with the National Environmental Policy Act of 1969 (NEPA). Maine Department of Transportation (MaineDOT) and Northern New England Passenger Rail Authority (NNEPRA) is expected to engage the Federal Transit Administration (FTA) as the federal funding agency. Because NEPA requires all federal agencies to consider the impacts of their actions on the environment, MaineDOT and NNEPRA will also engage FTA to discuss next steps relative to NEPA documentation for the alternative chosen.

Table 6. Environmental Metrics Evaluation

Evaluation Criteria	Route B.1	Route B.2	Route B.3
Potential Environmental Impacts			
Metric 2.1: Potential for increased air emissions	Negligible potential impacts	Negligible potential impacts	Negligible potential impacts
Metric 2.2: Potential impact to impaired water bodies	No anticipated impacts	No anticipated impacts	No anticipated impacts
Metric 2.3: Potential impact to non-impaired water bodies	Potential impact to less than 5 water bodies	Potential impact to less than 5 water bodies	Potential impact to less than 5 water bodies
Metric 2.4: Potential environmental justice impact	No anticipated impacts	No anticipated impacts	No anticipated impacts
Metric 2.5: Anticipated consultation and permitting effort	NEPA and Section 106 review is required if federal funding is used	NEPA and Section 106 review is required if federal funding is used	NEPA and Section 106 review is required if federal funding is used

Legend:

	High Ranking
	Medium Ranking
	Low Ranking

4.2.3 Cost Metrics ⁷

This section provides an overview of cost metrics for all three bus route alternatives.

4.2.3.1 Construction Cost

At this time all potential stops are pre-existing park and ride facilities. There is assumed to be no construction needed for all three commuter bus routes. The following thresholds were used to evaluate constructions cost:

High	Route would require a construction cost that is in the lower third of all alignments, including rail
Medium	Route would require a construction cost that is in the middle third of all alignments, including rail
Low	Route would require a construction cost that is in the upper third of all alignments, including rail

4.2.3.2 Vehicle Cost

The estimated vehicle cost was calculated by finding the average cost of commuter bus vehicles in FY 2020 for the New England region, \$304,288. The following thresholds were used to evaluate vehicle cost:

High	Route would require a vehicle cost that is in the lower third of all alignments, including rail
Medium	Route would require a vehicle cost that is in the middle third of all alignments, including rail
Low	Route would require a vehicle cost that is in the upper third of all alignments, including rail

4.2.3.3 Metrics 3.2 O&M cost

O&M costs include all expenses necessary to operate the service and maintain the vehicles and facilities. Fare revenue is not included in this metric which would help offset some of the O&M costs. Chapter 3 section 3.1.1.2 explains how operating costs were

⁷ The thresholds in this section compare estimated passenger rail costs from the 2019 *Operating Plans and Corridor Assessments* to estimated cost from potential commuter bus service.

estimated for each bus route. The proposed thresholds for evaluating O&M cost are as follows:

High	Route would require an O&M cost that is in the lower third of all alignments
Medium	Route would require an O&M cost that is in the middle third of all alignments
Low	Route would require an O&M cost that is in the upper third of all alignments

Table 7. Cost Metrics Evaluation

Evaluation Criteria	Route B.1	Route B.2	Route B.3
Estimated Cost			
Metric 3.1: Construction cost	None	None	None
Metric 3.2: Vehicle cost ⁸	\$346,900	\$346,900	\$346,900
Metric 3.2: Operations and maintenance (O&M) cost (assuming 12 roundtrips) ⁹	\$924,800-\$1,199,000	\$1,001,800-\$1,172,900	\$847,700-\$1,221,800

Legend:

	High Ranking
	Medium Ranking
	Low Ranking

⁸ This calculation accounts for the 1.14% inflation rate from FY2020 to FY2022.

⁹ Refer to Tables 2-4 for all estimated operating costs.

4.2.4 Implementation Timeframe Metric

4.2.4.1 Metric 4.1 Implementation timeframe

This metric measures how long it would take to design, permit, build, and open service. The thresholds used to evaluate the implementation timeframe are:

High	Service could open for revenue faster relative to other modes
Medium	Service could open for revenue service in a similar timeframe as other modes
Low	Service would require lengthy design and permitting that would delay opening service relative to other modes

Table 8. Implementation Timeframe Evaluation

Implementation Timeframe			
Metric 4.1: Ability to implement relative to other alternatives	Could open faster relative to other modes	Could open faster relative to other modes	Could open faster relative to other modes

Legend:

	High Ranking
	Medium Ranking
	Low Ranking

4.3 Key Takeaways

Tables 5 through 8 show the results of evaluation for each metric analyzed.

- ▶ **Mobility Metrics:** Route B.1 and B.2 provide slightly longer service than Route B.3, however both routes include an extra stop, providing service across more communities. Route B.3 serves an area (Brunswick, Freeport, and Portland) with existing Downeaster service. All three routes provide access to the Portland Transportation Center which allows access to two Metro bus routes. Commuter bus service will likely cost less than driving down the Maine Turnpike. The price to drive down the Maine turnpike is around \$23 roundtrip versus commuter bus ticket prices ranging from \$12 to \$20 round trip.¹⁰ Ridership for commuter bus service is projected to be lower than potential rail ridership for the corridor but ridership on any alternative will be driven significantly by cost of fares.
- ▶ **Environmental Metrics:** All routes have similar potential environmental impacts. Due to the use of federal funding any potential route chosen would be required to comply with the NEPA process.
- ▶ **Cost Metrics:** The average operational cost for all three potential routes is relatively similar. All three routes require four vehicles to operate at full capacity, vehicle cost will be the same across all three routes. There is assumed to be minimal to no construction for all bus route alternatives. All the potential stops are pre-existing park and ride facilities.
- ▶ **Implementation Timeframe Metrics:** Compared to other modes implementing commuter bus service will likely occur much faster. There is assumed to be minimal to no construction needed for commuter bus service, greatly reducing the implementation timeframe.

¹⁰ The Commuter Bus ticket price range is based off of the Commuter Rail price range provided in the 2019 Operating Plans and Corridor Assessments Report. Exact ticket prices have not been determined at this point for the study, subsidized Commuter Bus could potentially have a lower fare cost.

5

SUMMARY

Bus service can provide an alternative to passenger rail service that may have a slightly longer travel times but has considerably lower capital and operating costs and could be implemented on a shorter timeframe, either as a standalone service or interim during rail service development and construction. Little to no construction will be required for all three bus route alternatives. It is important to note that there are already private services operating in these corridors that may compete or enhance a newly implemented commuter bus service. However, private bus services currently operate at much lower levels of service than the potential commuter bus service plans detailed above. Next steps for this commuter bus service study include:

- ▶ Estimating potential ridership for commuter bus service;
- ▶ Develop conceptual schedules for each bus route;
- ▶ Develop a financial plan, and evaluate economic benefits;
- ▶ Engage the FTA as the federal funding agency and discuss next steps relative to NEPA in coordination with overall Lewiston-Auburn Passenger Rail Project.