



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
16 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0016

Janet T. Mills
GOVERNOR

Bruce A. Van Note
COMMISSIONER

Memorandum

Date: April 11, 2023

To: Senator Ben Chipman, Chair
Rep. Lynne Williams, Chair
Joint Standing Committee on Transportation

From: Bruce A. Van Note, Commissioner
Dale Doughty, Director of Planning
Nate Moulton, Transportation Planning Division Director
Nate Howard, Rail Program Director

Re: Lewiston and Auburn Passenger Rail Economic Evaluation

The 130th Maine Legislature directed the Maine Department of Transportation (MaineDOT) to conduct an economic evaluation study for commuter and passenger train service between Portland and the Lewiston and Auburn area (this Study). See 2021 Resolve Chapter 56, formerly LD 991 (the Resolve). This Study builds upon data included in the 2018 Transit Propensity Analysis and the Lewiston-Auburn Passenger Rail Service Plan published in May 2019. The Resolve required that a high-level alternatives analysis be conducted of two defined rail corridors as well as a comparison of other potential transportation connections, and that MaineDOT submit a report of the findings and recommendations to the Legislature's Joint Standing Committee in Transportation Committee.

A Project Advisory Group was established to help guide the Study. The Advisory Group consisted of Lincoln Jeffers, Director of Economic and Community Development in Lewiston, Michael Murray, Asst. Director of Public Works in Portland and Jack Clifford of the Lewiston and Auburn RR Company.

The results of this Study are contained in three documents by VHB dated March 2023 that accompany this memorandum: (1) the *Economic Evaluation* and alternatives analysis of the two rail corridors identified, (2) a *Preliminary Capital Investment Grant Rating Assessment* to assess the likelihood of funding, and (3) a *Bus Alternatives Analysis* as part of a high-level alternatives

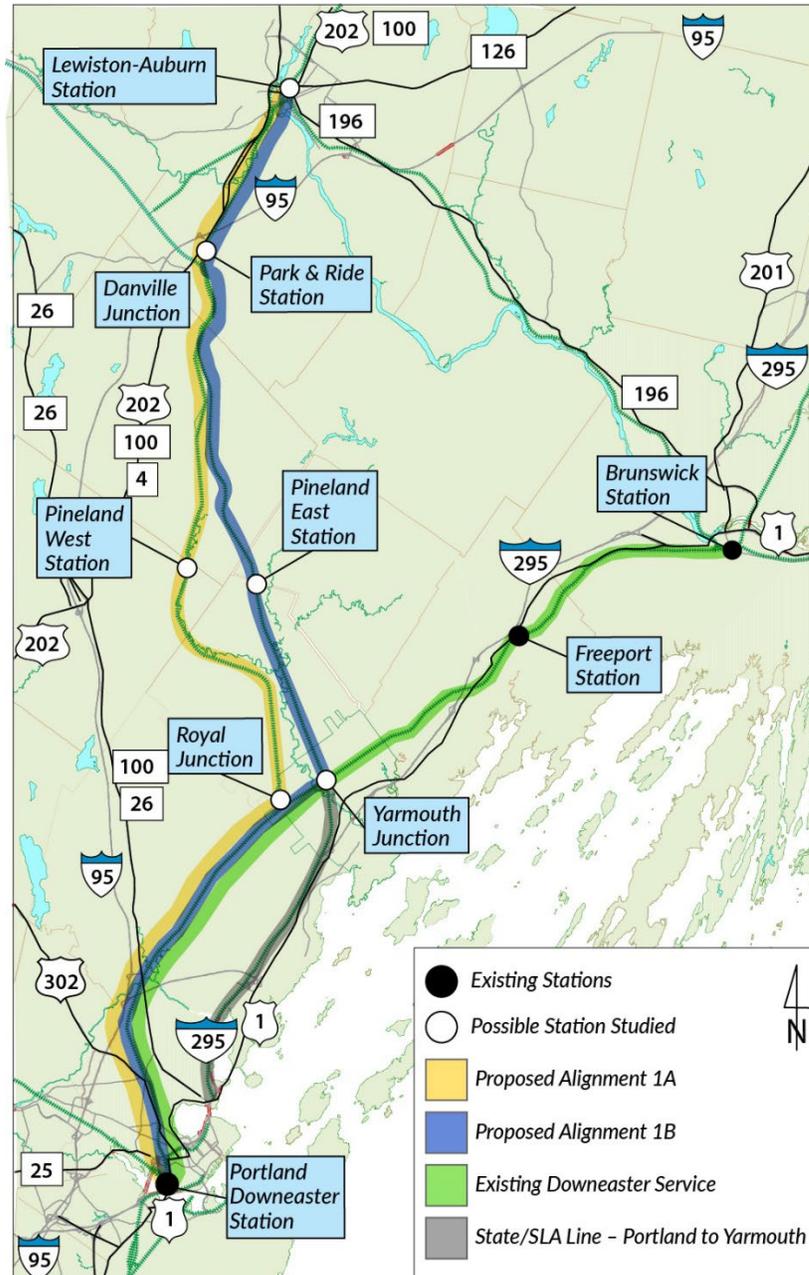
analysis. This memorandum summarizes each of these three components of this Study, and then sets forth MaineDOT's current conclusions and proposed near-term actions to improve public transportation connections between Portland and the Lewiston and Auburn area.

Economic Evaluation Study

The *Economic Evaluation Study* assessed potential development demand around general station areas, estimating high-level economic impacts and comparing findings for the two alternative rail alignments described below. The Study continues the planning process for the *Lewiston-Auburn Passenger Rail Service Plan* dated May 2019 by evaluating potential development demand around general station areas, estimating economic impacts for two alignment alternatives, and comparing findings.

Two Corridors Analyzed. The Resolve defined two potential rail corridors to evaluate:

- Alignment 1A. The western route -shown in yellow below - follows the active mainline of CSX (formerly Pan Am) from the Portland Transportation Center to the Lewiston and Auburn area.
- Alignment 1B. The eastern route – shown in blue below - also starts at the Portland Transportation Center and follows the CSX mainline and a short section of the CSX Brunswick branch line to Yarmouth Junction. From there, Alignment 1B heads north on the State-owned St. Lawrence and Atlantic corridor and reconnects with CSX mainline at Danville Junction, following the CSX mainline into Lewiston.



There are two noteworthy observations on the alignments identified by the Resolve. First, both alignments pass over the active mainline now owned by CSX, meaning that coordination with CSX will be required regardless of the alignment analyzed. Passenger rail service other than Amtrak – such as commuter rail operated by others – require the consent of the railroad. Second, neither of these alignments identified by the Resolve and prior studies include the section of the State-owned St. Lawrence and Atlantic corridor from Portland to Yarmouth Junction – shown as gray in the map above - which has been the subject of interest by certain commuter rail project advocates.

Economic Impacts. The study identified various economic impacts as summarized on Table ES-1 of the Executive Summary of the Economic Evaluation. These include potential new housing ranging from 166 to 397 units, potential new employment between 238 and 298, potential additional spending demand between \$380,000 and \$476,000, and additional property taxes ranging from \$646,000 to \$1,776,000 annually within the corridors. There are minimal distinctions between the two alignments and the resulting economic activity related to development in and around the line and station areas. Alignment 1B does provide higher economic value-added metrics. Most of this is related to added development in and around Yarmouth Junction and higher initial development and capital costs of this alignment.

Although significant, these impacts need to be placed in the context of the broader economy of these areas. Further, it should be noted that some of the potential development in housing and commercial property is not consistent with current municipal zoning and codes. Accordingly, local zoning ordinances may not allow for build out of the development identified and predicted as part of the economic evaluation. This is particularly true in the Yarmouth Junction area.

Estimate of Transit Ridership Demand. The 2018 Transit Propensity Analysis developed a range of ridership estimates by evaluating the demographics and travel patterns in the area, by considering the potential development opportunities of a rail connection, and by examining similar corridors across the country. The analysis (summarized in Table 1) indicated that there is latent demand (i.e., demand for transit service that is currently unmet and either accommodated on another mode or a trip not taken) for a transit connection between Lewiston or Auburn and Portland. The lower and upper limits of the ridership demand would depend largely on the level-of service and connections that would be made.

Table 1. Transit Propensity

	Near-Term Ridership Potential [projected to 2040]		Long-Term Ridership Potential [projected to 2040]	
	Daily Rail Trips		Daily Rail Trips	
	Low	High	Low	High
12-20 Transit-Style Service Trips	600	800	700	1900
Up to 4 Intercity-Style Service Trips	210	240	250	330

Existing Transit Service Along the Corridor. 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. There is also a local bus system called Citylink serving Lewiston and Auburn that provides connections to the express service.

The Concord Coach Line has three existing bus stops in Lewiston and Auburn. 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. Ticket prices on the Greyhound Line range from \$15 to \$20 one way.

Preliminary Federal CIG Ratings Assessment

The Preliminary Capital Investment Grant Ratings Assessment accompanying this memorandum analyzed the likelihood for qualifying for funding for passenger rail alternatives from the Federal Transit Administration (FTA) New Starts and Small Starts discretionary grant programs. Capital Investment Grant (CIG) program is competitive and provide capital funding for transit capital investments, including heavy rail, commuter rail, light rail, streetcars, and bus rapid transit. The estimated Capital Cost (in 2022-year dollars) for Alignment 1A is \$230 million and for Alignment 1B is \$254 million. Half of these amounts would need to come from state or local funds.

Fifty percent of the rating of a project is based on 6 justification criteria and the remaining 50% of the rating is based on local financial commitment of matching capital funding and subsidy of ongoing operations. FTA typically requires a minimum of 50% commitment of the project cost to be local (non-federal) funding on selected projects. Based upon these criteria, this Assessment shows that its current form, the extension of passenger rail to the Lewiston and Auburn area passenger does not appear eligible for competitive federal CIG funding. For more detail, see the full assessment accompanying this memorandum.

Bus Alternatives Analysis

The *Bus Alternatives Analysis* was completed as part of the high-level alternatives analysis required by the Resolve. Three different bus routes were reviewed as alternatives that parallel the rail corridors. Key takeaways are that a frequent and reliable commuter bus alternative:

- Can be implemented quickly, as opposed to the many years required to further study, design, fund and construct a passenger rail extension.
- Has travel times competitive with passenger rail, although such times may be slightly longer and may be impacted by highway traffic depending on the bus route chosen.
- Has dramatically lower initial capital costs because it utilizes existing highway capacity (4 buses estimated at \$1.6 million).

- Avoids the need to upgrade and maintain rail corridors, which in the case of Alignment 1B includes a parallel rail corridor in close proximity.
- Has significantly lower operating costs than passenger rail
- Likely will not provide as much of the economic development potential at stops as the passenger rail stations considered in the Economic Analysis.
- Often serves as an initial step towards new passenger rail service by demonstrating ridership demand between communities.
- Offers the flexibility to provide multiple stops within Lewiston and Auburn and Portland on a one seat transit ride (no connections), not just along on the rail corridor as required by passenger rail.
- Can be more easily tailored to meet and change with the workforce, equity needs of passengers and provide connecting services to existing passenger rail options.

Comparison of Costs Across Alternatives. The 2019 Lewiston-Auburn Passenger Rail Service Plan examined what kind of service should be provided to meet the travel demand/patterns observed in Transit Propensity Analysis (i.e., route alignment, service frequency), as well as the costs to build and operate service. Cost estimates for initial capital investment and ongoing operations for both the rail and bus alternatives are summarized in Table 2 below.

The capital cost to extend passenger rail to the Lewiston and Auburn area ranges from \$264 to \$349 million depending on the alignment chosen. By way of comparison, these projected costs rival the amount of capital funding from all sources, both federal and state that MaineDOT expends on the multimodal transportation systems statewide including transit, aviation, rail, ports, ferries, and active transportation. Further, even if the project was eligible and competitive for federal funding, state or local matching funds would be required, which would range from \$132 to \$174 million for a commuter rail service and \$53 to \$70 million for an Intercity-type rail service. Simply stated, passenger rail to the Lewiston and Auburn area would require a very high initial capital cost.

Table 2. Comparison of Costs Across Alternatives

Category:	Rail		Bus		
	Alignment 1A	Alignment 1B	Route B1	Route B2	Route B3
Infrastructure Costs	\$189 to \$230M	\$207 to \$254M	0	0	0
Vehicle Costs	\$75 to \$95M	\$75 to \$95M	\$1.6M	\$1.6M	\$1.6M
Capital Cost Total	\$264 to \$325M	\$282 to \$349M	\$1.6M	\$1.6M	\$1.6M
Annual O&M Cost	\$15 to \$19M	\$16 to \$20M	\$0.9 to \$1.2M	\$1 to \$1.2M	\$0.85 to \$1.2M

Further, there would be an ongoing annual need to subsidize the operation and maintenance of the new passenger rail service. By way of example, the current Downeaster service which

has a farebox recovery of around 50%, requires an annual public subsidy over \$17 million per year. Quantification of subsidy requires assumptions on routes, stops, and frequency, but assuming a similar farebox recovery as the Downeaster, it is reasonable to estimate that the ongoing operational subsidy needed to extend passenger rail to Lewiston and Auburn could be in the range of \$7.5 to \$9.5 million dollars per year.

As noted above, the bus alternatives require lower capital and operational subsidy costs as these services rely on existing highway capacity. Again, the initial capital costs are for equipment acquisition (4 buses estimated at \$ 1,600,000). The annual operation cost for bus services ranges from \$850,000 to \$1,200,000. Similar to the rail alternatives, it is assumed that a significant portion of this amount would be covered by an operating subsidy.

Climate and Equity Considerations. Public transportation decisions need to consider factors beyond numerical unmet demand and costs. In accordance with Maine’s climate action plan, *Maine Won’t Wait*, reducing greenhouse gas emissions is a primary transportation goal in Maine. Additionally, in accordance with its *Statement on Equity*, MaineDOT is committed to meeting customers where they are and ensuring that all Maine people have access to safe and reliable transportation options that support economic opportunity and quality of life regardless of a person’s economic, social, ethnic, racial, age, sexual orientation, physical, mental, or geographic circumstance. A key component of equity is acknowledgement that transportation needs, and solutions differ depending on geography, demographics, and individual circumstances. MaineDOT is committed to equitable delivery of our programs and services to meet the mobility equity needs of all Maine people in both rural and urban areas.

Applying these considerations to this matter, greenhouse gas reductions from increased public transportation would be modest given relatively low ridership demand. Further, such reductions could be well addressed through additional bus service, especially as those buses electrify. In terms of equity, lower income, or elderly customers without access to vehicles are more typically users of commuter and intercity bus services in a state like Maine, as there can be flexibility designed to meet more customers where they are. Thus, it appears that enhanced bus service between Lewiston and Auburn and Portland will provide as good and perhaps better solution in terms of equity.

Conclusions and The Recommended Path Forward

Based on information from the various Lewiston and Auburn passenger rail studies, including the 2018 Transit Propensity Analysis, the 2019 Lewiston-Auburn Passenger Rail Service Plan, and the current Study, MaineDOT has concluded that passenger rail service to Lewiston and Auburn is currently not eligible or competitive for federal discretionary funding. Considering

the limitations of other sources of funding, including State and local capital funding and the need for significant ongoing operational support, the MaineDOT does not support designing or constructing a passenger rail alternative between Portland and the Lewiston and Auburn area at this time.

Instead, MaineDOT plans to pursue the achievable alternative of improved bus service serving intercity and commuter needs. This alternative involves much lower capital and operational costs in the near and long-term, can be started quickly as a pilot, is more flexible in terms of defining and revising workforce and equity needs, is climate friendly, and can serve to assess ridership demand for future consideration of passenger rail. There will be continued collaboration to improve connectivity to intercity rail.

MaineDOT recommends advancing a 2-year pilot commuter bus service between Portland and the Lewiston and Auburn area that provides a level of frequency and service that was envisioned by the recent rail studies in this corridor. This service will provide transit access to the Lewiston and Auburn area to not only connecting rail and bus going south of Portland but single seat transit access to centralized transit and employers in Portland. The pilot service will initially focus on both commuter and intercity customers. This is a cost-effective way to start a public transportation connection. It will provide real world data on transit need and demand in the corridor and with success can help justify and build towards future consideration of rail service and better justification for Federal funding. MaineDOT intends to start such a commuter bus service pilot in the first half of 2024.

MaineDOT is aware that this conclusion and path forward likely will be rejected by some passenger rail project supporters, and that there could be calls for further study. That is all part of advocacy and the political process, and MaineDOT will respectfully engage in that debate and implement the results of any such processes.

In the end, MaineDOT is statutorily charged to consider all transportation needs statewide in a balanced, comprehensive, and objective manner and seek reasoned, cost-effective solutions to demonstrated needs. In accordance with this statutory charge, MaineDOT's guiding principles call for being responsible stewards of the public funds by seeking the most cost-effective solutions to demonstrated transportation needs, making reasoned, fact-based decisions that consider long-term benefits and costs, and pragmatically using pilot programs in implementation when feasible. We believe improvement of bus service between Portland and the Lewiston and Auburn area meets this statutory charge.



LEWISTON-AUBURN PASSENGER RAIL STUDY

Economic Evaluation Study

January 2023

PREPARED BY

IN ASSOCIATION WITH



THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

Executive Summary	ES-1
Introduction.....	1
1.1 Overview of Study.....	2
1.2 Baseline Metrics and Assumptions for Potential Station Areas	5
1.2.1 Assumptions	5
1.2.2 Station Area Baseline Metrics	5
Methodology & Alignment Comparison	39
2.1 Alignment 1A Potential Stations	43
2.2 Alignment 1B Potential Stations	45
2.3 Comparisons of Alignment Alternatives	47
Key Findings	49
3.1 Key Findings	50
3.1.1 Population Change by Age Cohort	50
3.1.2 Household Change by Tenure – Owner and Renter	51
3.1.3 Residential Development Potential 2021 - 2026.....	52
3.1.4 Projected Population Change as a Result of Household Change	54
3.1.5 Owner Home Values.....	56
3.1.6 Income Comparisons.....	57
3.1.7 Selected Employment Comparisons	58
3.1.8 Comparisons of Potential Service and Office Sector Development	59
3.1.9 Comparisons of Potential Retail Sector Development.....	61
3.1.10 Estimates of Selected Retail Spending Demand from Households and Employees.....	63
3.2 Fiscal and Economic Benefits	65
3.2.1 Ridership and Revenues.....	69
3.3 Other Considerations and Transit Benefits	69
3.3.1 Safety Benefits.....	69
3.3.2 Energy and Emission Reductions	73
3.3.3 Affordable Mobility	74
Appendix A: Potential Auburn Urban Station Area	A
Appendix B: Maine Legislative Resolve (L.D. 991), Chapter 56	H

LIST OF TABLES

Table No.	Description	Page
Table ES-1	Summary Comparison of Fiscal and Economic Impacts by Alignment	ES-4
Table ES-2	Summary of Capital and O&M Costs by Alignment (2019 Dollars).....	ES-6
Table ES-3	Rail Ridership Propensity	ES-6
Table 1	Potential Lewiston Station - Selected Comparative Socio-Economic Metrics.....	9
Table 2	Potential Lewiston Station - Estimated Residential Development Potential	10
Table 3	Potential Lewiston Station - Selected Retail Demand and Sales Comparisons.....	11
Table 4	Potential Auburn Park and Ride Station - Selected Comparative Socio-Economic Metrics.....	15
Table 5	Potential Auburn Park and Ride - Estimated Residential Development Potential	16
Table 6	Potential Auburn Park and Ride - Selected Retail Demand and Sales Comparisons	17
Table 7	Potential Pineland West Station Area - Selected Comparative Socio-Economic Metrics.....	20
Table 8	Potential Pineland West Station Area - Estimated Residential Development Potential	21
Table 9	Potential Pineland West Station Area - Selected Retail Demand and Sales Comparisons	22
Table 10	Potential Pineland East Station Area- Selected Comparative Socio-Economic Metrics.....	25
Table 11	Potential Pineland East Station Area - Estimated Residential Development Potential	26
Table 12	Potential Pineland East Station Area - Selected Retail Demand and Sales Comparisons	27
Table 13	Potential Royal Junction Station Area - Selected Comparative Socio-Economic Metrics.....	30
Table 14	Potential Royal Junction Station Area - Estimated Residential Development Potential	31
Table 15	Potential Royal Junction Station Area - Selected Retail Demand and Sales Comparisons	32

Table 16	Potential Yarmouth Junction Station Area - Selected Comparative Socio-Economic Metrics.....	35
Table 17	Potential Yarmouth Junction Station Area - Estimated Residential Development Potential	36
Table 18	Potential Yarmouth Junction Station Area- Selected Retail Demand and Sales Comparisons	37
Table 19	IMPLAN Model Results Alignment 1A – Infrastructure Costs	43
Table 20	IMPLAN Model Results Alignment 1A – Ongoing Annual O&M Costs.....	44
Table 21	IMPLAN Model Results Alignment 1B – Infrastructure Costs	45
Table 22	IMPLAN Model Results Alignment 1B – Ongoing Annual O&M Costs.....	46
Table 23	Infrastructure Costs Comparison.....	47
Table 24	Annual O&M Costs Comparison.....	48
Table 25	Comparative Estimates of Economic and Fiscal Benefits per Potential Station Area	66
Table 26	Selected Groupings of Potential Station Areas and Estimated Economic and Fiscal Benefits	68
Table 27	Ridership and Revenue Estimates (2025 and 2040)	69
Table 28	Calculated Estimation of Value of Time	72
Table 29	Potential Auburn Urban Station Area - Selected Comparative Socio-Economic Metrics.....	D
Table 30	Potential Auburn Urban Station - Estimated Residential Development Potential	E
Table 31	Potential Auburn Urban Station - Selected Retail Demand and Sales Comparisons	E
Table 32	Potential Auburn Urban Station Area - Summary of Estimated Economic / Fiscal Impacts	G

LIST OF FIGURES

Figure No.	Description	Page
Figure 1	Potential Station Locations of Alignments 1A and 1B	4
Figure 2	Lewiston Station Study Area.....	6
Figure 3	Lewiston Station Area Pipeline Residential Development (15-Minute Walk Time).....	12
Figure 4	Auburn Park and Ride Station Study Area.....	13
Figure 5	Pineland Station Study Areas - West and East.....	18
Figure 6	Royal Junction Station Study Area.....	28
Figure 7	Potential Yarmouth Junction Station Study Area	33
Figure 8	Potential Royal Junction & Yarmouth Junction - Station Study Areas Overlap	33
Figure 9	Flow Chart of IMPLAN Modeling Concepts	40
Figure 10	IMPLAN Modeling Calculation Process	41
Figure 11	Population Change by Potential Station Area and Selected Age Cohorts, 2021 – 2026	51
Figure 12	Household Change by Potential Station Area and Tenure, 2021 – 2026	52
Figure 13	Owner Residential Units - Estimated Potential for Development	54
Figure 14	Renter Residential Units - Estimated Potential for Development	54
Figure 15	Projected Population Change as a Result of Household Change by Potential Station Area	55
Figure 16	Owner Home Values by Potential Station Area - Projected 2026.....	56
Figure 17	Median Household and Per Capita Incomes by Potential Station Area - Projected 2026	57
Figure 18	Employment Comparisons by Potential Station Area - 2021.....	59
Figure 19	County Employment Change for Selected Industry Sectors, Projected 2022 – 2031	59
Figure 20	Estimated Service and Office Sectors Development Potential by Station Area	60
Figure 21	Estimated Retail Sector Development Potential by Station Area for Selected Sectors.....	62

Figure 22	Estimated Change in Household Retail Spending Demand by Potential Station Area	63
Figure 23	Estimated Change in Employee Spending Demand for Dining & Drinking	64
Figure 24	Estimated Value of Reduced Fatalities and Injuries	71
Figure 25	Comparative Transit BTUs – Energy Efficiency by Mode of Transit	73
Figure 26	Potential Auburn Urban Station Study Area	B
Figure 27	Auburn Total Estimated Potential for Retail Development - Pipeline and Baseline	F

THIS PAGE INTENTIONALLY LEFT BLANK

ES

EXECUTIVE SUMMARY

Study Overview

L.D. 991, passed by the Maine State Legislature, directed the Maine Department of Transportation (MaineDOT) to perform an economic evaluation for commuter and passenger train service between Portland and the Lewiston and Auburn Area. The LD also directed that the economic evaluation include two full build alignments from earlier reports. This report provides that economic evaluation as a follow on of earlier reports: *Operating Plans and Corridor Assessments* (May 2019) and the *Transit Propensity Analysis Report* (August 2018). The 2019 report recommended an economic study as the next step. This report continues the planning process for the Lewiston-Auburn Passenger Rail Study by evaluating potential development demand around general station areas, estimating economic impacts for two alignment alternatives, and comparing findings.

RKG Associates, Inc. (RKG) was retained as a subconsultant by VHB on behalf of the MaineDOT to prepare this assessment of the prevailing market conditions associated with

the potential development of commuter rail stations¹ along two selected potential rail alignments from Lewiston–Auburn to Portland, Maine:

- ▶ 1A (PAR) is the western route for the proposed rail services with three station areas²: Lewiston, Auburn (Park and Ride), and Pineland West.
- ▶ 1B (SLR) is the eastern route for the proposed rail services with four station areas: Lewiston, Auburn (Park and Ride), Pineland East, and Yarmouth Junction.

Key Findings from Economic Evaluation

There may be little distinction between the two Alignments.

The economic analysis finds that Alignment 1B requires a higher initial investment or capital costs; however, this is because it consists of four station sites, while Alignment 1A consists of three station sites.

Similarly, Alignment 1B sees greater value-added metrics (statewide economic ripple effects) than Alignment 1A, but this is directly related to the higher initial investment costs for Alignment 1B and does not inherently favor one alignment over the other.

The summary key findings of this research offered next refer specifically to the fiscal and economic benefits associated, as well as the results of the economic modeling³ for the two proposed Alignments. It is important to note that a review of local zoning was not part of the economic evaluation. Therefore, current zoning or local ordinances may not allow for build out of the development identified and predicted as part of the evaluation.

Fiscal and Economic Impacts

The summary estimates of the fiscal and economic impacts associated with each proposed Alignment are shown in Table ES-1. The more detailed analysis and findings relating to specific station areas are discussed in subsequent chapters of this report.

¹ This analysis is predicated on the specific assumption, although conceptual at this time, that an actual physical station structure would be developed for each location under consideration.

² The Royal Junction station was removed from consideration for Alignment 1A, its analysis is included throughout the report for reference.

³ Providing an estimate of the direct, indirect, and induced economic impacts arising from an initial investment in the economy, such as the one-time construction (capital costs) and annual ongoing (O&M) costs associated with the two corridor Alignment options considered in this analysis.

The last two columns of Table ES-1 offer a comparative benchmarking or indexing estimate of the return of the initial capital cost investment for each Alignment⁴, in percentage terms.

⁴ For example, the infrastructure capital cost of \$189.00 million, the low estimate for Alignment West reflects:

A 1.52% return in annual householding – with the actual dollar amount of household spending a function of the number of new households and the average annual expenditure per household. A 0.20% return in employing spending – with the actual dollar amount of employee spending a function of the estimated increase in employment and annual spending. An 0.34% in gross residential property tax receipts.

Table ES-1 Summary Comparison of Fiscal and Economic Impacts by Alignment

Summary Comparisons by Considered Alignment	Alignment 1A ¹ (PAR)	Alignment 1B ² (SLR)	Alignment 1A (PAR)	Alignment 1B (SLR)
	Low - High		Low - High	
New Housing Total	166 - 246	239 - 397	\$189 - \$230 million	\$207- \$254 million
Owner Units	54 - 89	106 - 211		
Renter Units	112 - 157	133 - 186		
Change in Household Spending in \$1,000's	\$2,869.6 - \$4,380.9	\$5,921.6 - \$9,216.4	1.52% - 1.90%	2.86% - 3.63%
Development Potential Total	21,446	36,347		
Retail SF	6,634	18,062		
Non-Retail SF ³	14,812	18,285		
Potential Employment⁴	238	298		
Potential Spending Demand	\$380,602	\$476,059	0.20% - 0.17%	0.23% - 0.19%
Potential Fiscal Impacts (FY22)				
Owner Value ⁵	\$12,951.31 - \$21,380.56	\$28,273.97 - \$57,329.89		
Renter Value ⁶	\$14,647.71 - \$20,524.19	\$17,176.73 - \$24,016.64		
Total Residential Value (\$1,000's)	\$27,599.01 - \$41,904.75	\$45,450.70 - \$81,346.54		
Estimated Gross Property Tax	\$646,453.00 - \$966,308.00	\$1,016,950.00 - \$1,776,020.00	0.34% - 0.42%	0.49% - 0.70%
Retail Value/SF	\$150	\$150		
Non-Retail Value/SF	\$225	\$225		
Total Non- Residential Value \$1,000's	\$4,327.71	\$6,823.40		
Estimated Gross Property Tax	\$103,797.00	\$154,304.00		

Source: Maine Revenue Services, US Census Bureau and RKG (2022)

(1) Alignment West includes Lewiston, Auburn (Park and Ride) and Pineland West stations

(2) Alignment East includes Lewiston, Auburn (Park and Ride), Pineland East and Yarmouth stations

(3) Excludes manufacturing

(4) Excludes retail

(5) Reflects an estimated average (2017-2021) building permit value/unit in \$1,000's - Androscoggin (\$204,950) and Cumberland (\$294,670) - single family homes

(6) Reflects an estimated average (2017-2021) building permit value/unit in \$1,000's - Androscoggin (\$131,580) and Cumberland (\$120,430) - 5+multi-family homes

(7) These metrics offer an estimated percent return for the selected metric relative to the initial investment, or capital costs, of each of the two (2) Alignments under consideration. For example, a \$189.00 million investment in Alignment West (low) returns 0.34% in gross property tax receipts.

Other Potential Benefits of Rail Service

Rail service can result in other economic benefits, including but not limited to the following metric areas.

Travel Time Savings

Transportation infrastructure improvement projects may seek to reduce travel times for users of the transportation system, for example, by improving traffic flow, increasing transit vehicle operating speeds or decrease transit service headways, or to provide new, shorter connections between destinations. Value of Travel Time Savings is estimated in monetary form by considering the value of time, change in trip time, and number of affected trips.

Comparative Value of Energy and Emission Reductions

A study of transit energy consumption⁵ found that automobile travel results in the most inefficient energy use with an average consumption of more than 5,000 BTUs per passenger mile. This compares to an approximate usage of 1,500 BTUs per passenger mile for commuter rail.

The relative costs for commuter rail travel are therefore significantly lower than costs for automobile travel, particularly with regard to near term costs which are quickly increasing. Chapter 3 will detail these benefits further.

Affordable Mobility

Public transportation can be a more affordable travel option particularly for low- to moderate-income individuals and households with consideration to costs for fuel, maintenance, and lease or purchase prices for personal automobiles. While this savings varies by city, location, and type of rail service, it is generally acknowledged that transit use can help reduce the portion of household income utilized for transportation. A potential reduction in household expenditures for transportation could translate to greater income availability for housing, consumer spending, education, childcare, healthcare, and other annual household expenditures.

⁵ As reported in a research paper entitled Transportation, Social And Economic Impacts of Light and Commuter Rail, as prepared by the Texas Transportation Institute of Texas A&M University.

As a reference, Tables ES-2 and ES-3 summarize costs and ridership analyses from the 2019 Operating Plans and Corridor Assessments report.

Table ES-2 Summary of Capital and O&M Costs by Alignment (2019 Dollars)

	Alignment 1A	Alignment 1B
Infrastructure Costs	\$189 to \$230 million	\$207 to \$254 million
Vehicle Costs	\$75 to \$95 million	\$75 to \$95 million
Total Capital Cost	\$264 to \$325 million	\$282 to \$349 million
Annual O&M Cost	\$15 to \$19 million	\$16 to \$20 million

Source: Operating Plans and Corridor Assessments (May 2019)

Note: If this service is contracted out to an operator, the operator may provide the vehicles, negating the need to procure vehicles. Since it is unknown who would operate the service at this time, vehicle acquisition costs were assumed.

Note: Costs have not been updated as a part of this study.

Table ES-3 Rail Ridership Propensity

	Near-Term Ridership Potential (Projected to 2025)		Long-Term Ridership Potential (Projected to 2040)	
	Daily Rail Trips		Daily Rail Trips	
	Low	High	Low	High
12-20 Transit-Style Service Trips	600	800	700	1900
Up to 4 Intercity-Style Service Trips	210	240	250	330

Source: Operating Plans and Corridor Assessments (May 2019)

1

INTRODUCTION

This chapter will introduce the overview and purpose, with a focus on baseline metrics and existing conditions surrounding the potential station areas that were studied:

- ▶ Lewiston Station
- ▶ Auburn Station (Park and Ride)
- ▶ Pineland West Station
- ▶ Pineland East Station
- ▶ Yarmouth Junction Station
- ▶ *Royal Junction Station*⁶

⁶ The Royal Junction station was removed from consideration in this study, its analysis is included throughout the report for reference.

1.1 Overview of Study

This Economic Evaluation Study continues the planning process for the Lewiston-Auburn Passenger Rail Study by assessing potential development demand around general station areas, estimating high level economic impacts, and comparing findings for two alternative rail alignments linking Lewiston and Auburn to Portland, Maine.

A high level analysis was conducted for a total of six potential stations that make up the two alignments: Lewiston, Auburn (Park and Ride), Pineland West, Pineland East, Yarmouth Junction, and Royal Junction. After consultation with the study committee, it was determined that the Royal Junction station location was not advantageous from the perspective of matters such as land uses and zoning and was removed from consideration. The Royal Junction station analysis is included throughout the report for reference.

These two alignments, 1A and 1B are displayed in Figure 1 and outlined below. This chapter will focus on existing conditions and baseline metrics surrounding the station areas that were studied, with attention to population, housing, home values, income, and business diversity. Residential development potential and retail demand were also analyzed.

Potential station areas along Alignment 1A (West) include the following along the Pan Am Railroad (PAR) corridor⁷:

- ▶ Lewiston
- ▶ Auburn (Park and Ride)
- ▶ Pineland West

Potential stations areas along Alignment 1B (East) include the following along the St. Lawrence & Atlantic Railroad (SLR) corridor:

- ▶ Lewiston
- ▶ Auburn (Park and Ride)
- ▶ Pineland East
- ▶ Yarmouth Junction

⁷ The Royal Junction station was removed from consideration for Alignment 1A in this study, its analysis is included throughout the report for reference.

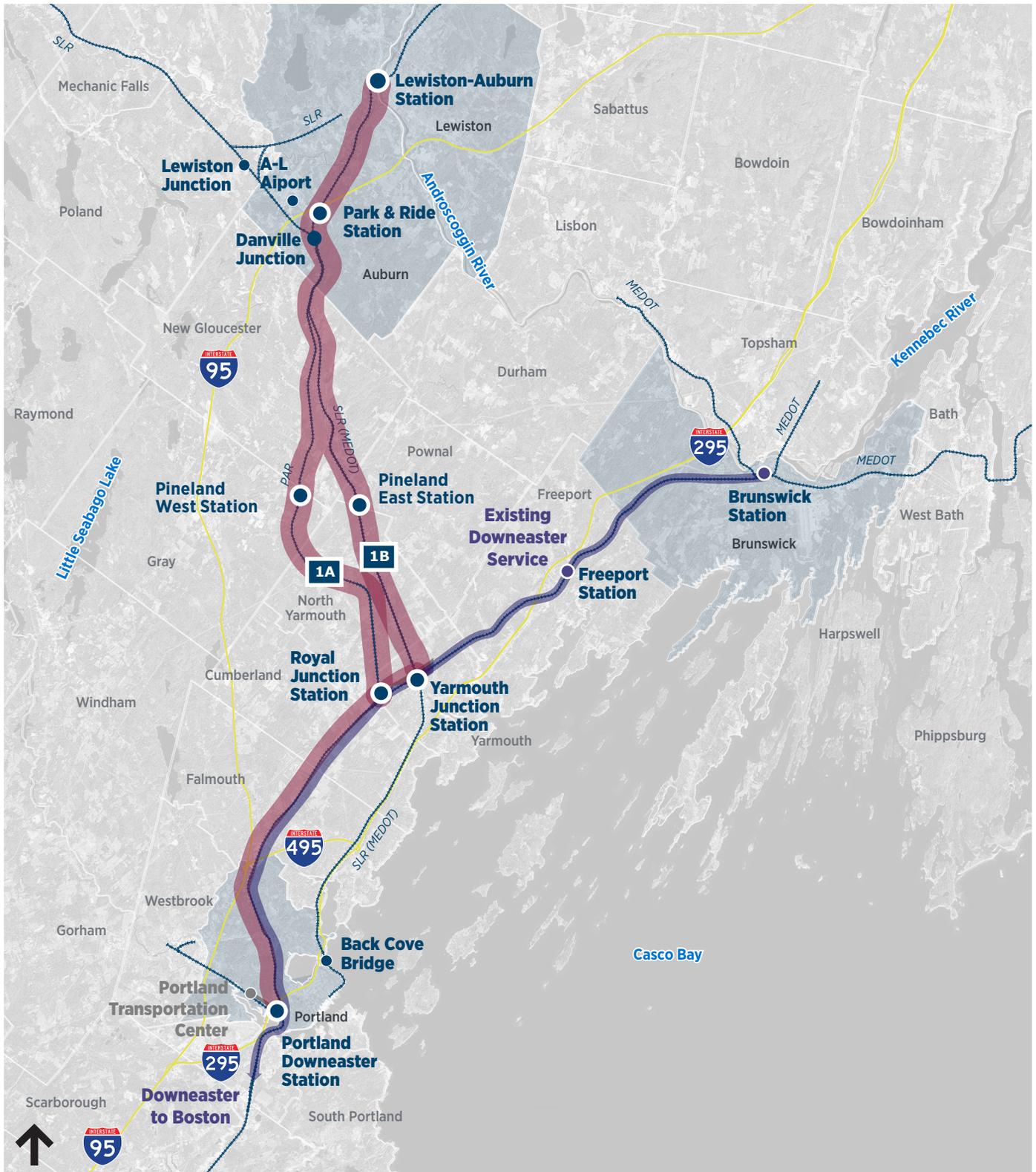
This study analyzed the economic and fiscal impacts of the construction of the rail line and stations as well as any potential development that may be projected at each station area. This analysis:

- ▶ Defines an appropriate study area around each potential station area location, excluding Portland, Maine.
- ▶ Compiles baseline metrics and projected metrics (where applicable) of selected socio-economic indicators for each potential station location.
- ▶ Contrasts the selected station metrics to comparable metrics for a broader geography, in this case the county.
- ▶ Develops estimates of additional development potential such as residential, commercial, or retail opportunities for each potential station location noting that the unknown factor is the availability and or possible assemblage of land to accommodate such development.
- ▶ Utilizes Impact Analysis for Planning (IMPLAN) econometric modeling to determine the potential direct, indirect, and induced economic impacts of the construction of the line and potential stations.⁸
- ▶ Estimates potential fiscal and economic impacts that could result from projected development around each station and various station combinations: new housing, jobs, spending, and taxes.

General station areas were selected from a previous report, *Operating Plans and Corridor Assessments (May 2019)*. Particular and specific station site selection is a later part of the planning and design process. While the station locations will still need to be identified, it is not expected that a slight shift in station location along the alignment - within a reasonable distance from those identified in this analysis - would substantially change the outcomes of the estimated economic benefits. As noted throughout this analysis, any potential “near to the station” development would also depend on a variety of other factors including available land (either vacant or that could be assembled), local regulatory and zoning guidelines and action taken by a willing and able developer.

A review of local zoning for each of the municipalities was not part of the economic evaluation. Current zoning or local ordinances may or may not allow for build out of the development identified and predicted as part of the evaluation.

⁸ RKG modeled and summarized the impacts of several different alternatives based on information provided by previous studies and input from Project Advisory Committee.



\\whb.com\gbl\proj\Boston\15608.00 Portland Passenger Rail\tech\Economic Support\Graphics\Alignment_Figures_Combined.incd



-  Existing Downeaster Service
-  Proposed Alignments
-  Existing Downeaster Station
-  Potential Stations

LEWISTON-AUBURN ECONOMIC EVALUATION STUDY

Alignments 1A/1B with Potential Stations

1.2 Baseline Metrics and Assumptions for Potential Station Areas

1.2.1 Assumptions

Study areas were defined around each potential station area. At this stage of the project, general locations for stations were identified for purposes of conducting the economic study. Particular station site selection is a later part of the planning and design process.

For the potential Lewiston station site, which is more dense, walkable downtown locations, an approximate 15-minute walk time serves as the study area.

For all other potential station areas, which are currently less urban and less dense, a 1-, 2- and 3-mile radius around each station serves as the area to capture future development. While it is reasonable to assume that any future development would potentially occur closest to the station, a broader 3-mile radius allows for possible assemblages of land to accommodate development activity. For the purposes of this analysis, all metrics for these stations are reported at the 3-mile radius.

1.2.2 Station Area Baseline Metrics

The primary selected metrics analyzed for each potential station area for estimates of additional non-rail/station development opportunities considering the following:

- ▶ Population
- ▶ Housing
- ▶ Owner Home Values
- ▶ Incomes
- ▶ Business Diversity

Availability and/or possible assemblage of land to accommodate such development were not considered at this time, as this study did not include analyses of local zoning and ordinances that may or may not allow for the density of development being contemplated. The metrics are available in accompanying tables and described below.

Additional areas of analysis include:

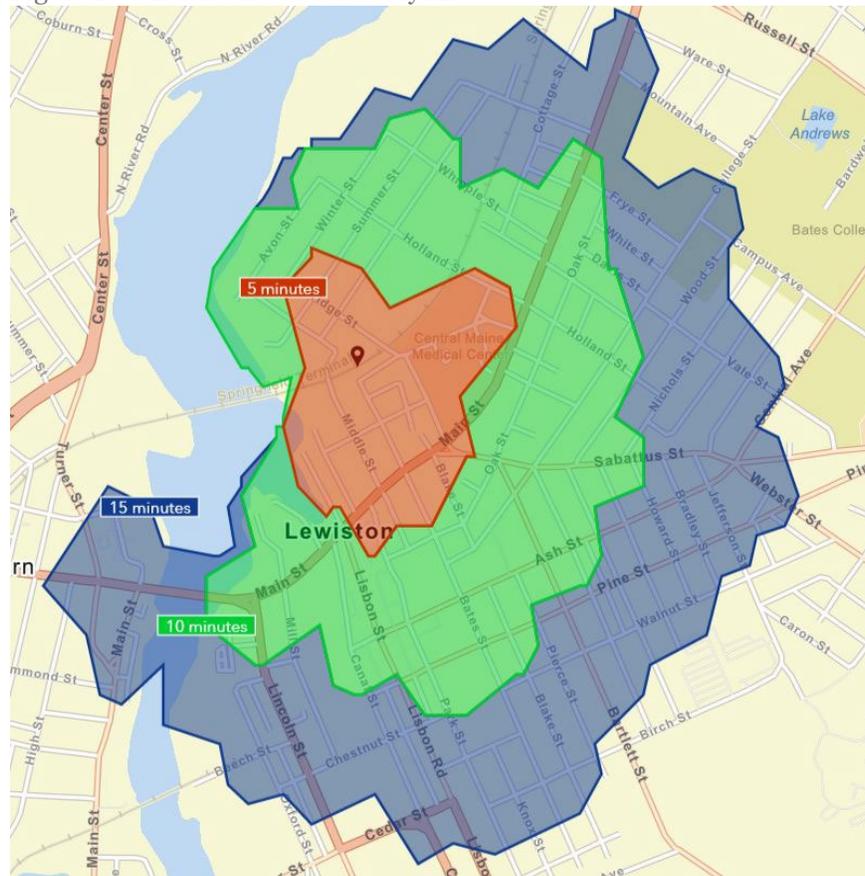
- ▶ Residential Development Potential
- ▶ Retail Demand and Sales Comparisons

1.2.2.1 Potential Lewiston Station Area

The potential Lewiston station area is aligned with the Pan Am Railroad corridor located in the western end of its downtown, a walkable urban setting adjacent to the Androscoggin River. Downtown Lewiston consists of a diverse array of retail, residential, medical, manufacturing, and recreational facilities, along with cultural, religious, and government institutions. Its density supports a growing number of residents living throughout the downtown, both as renters and owners.

As an urban setting for the potential Lewiston station area, it was determined that an approximate 15-minute walk time about the site as an appropriate definition of a study area, depicted in Figure 2. While it is reasonable to assume that a potential Lewiston station would attract ridership from throughout the city and a broader geography, the opportunities for other development are assumed to reflect proximity to the station.

Figure 2 Lewiston Station Study Area



Selected Comparative Socio-Economic Metrics

Comparative metrics for the potential Lewiston station area (15-minute walk time) and Androscoggin County are summarized in Table 1, noting the following:

- ▶ **Population** – Population growth is projected for both the potential Lewiston station study area and Androscoggin County over the 2021 to 2026 time-period. By 2026, the potential station study area total population is projected to account for 8.7% of the county population, a steady representation since 2010.
 - The 20 to 34 years cohort population is projected to decline by 1.8% for the station study area and decline by 3.9% countywide. **This cohort often represents those moving out of home or graduating from college and seeking initial independent housing, typically renter occupied versus owner occupied.**
 - The 35 to 54 years age cohort population is projected to increase by 1.9% for the station study area and decline by 0.9% at the county level. By 2026, this cohort is projected to make up 7.4% of the county population similarly aged – an increase in representation since 2010. **This is noteworthy as this cohort typically represents those in their family/household formation years as well peak earning and spending years. This is further reflected in the median age of the study area population, which is “younger” when compared to county.**
 - The 65 years and older cohort population is projected to increase by 8.5% for the station study area and by 13.4% at the county level. By 2026, this cohort is projected to make up 6.1% of the county population, a decrease in representation since 2010 when it was 6.7%. **This cohort often includes those seeking to downsize their residences and possibly seeking assisted living or other elderly care residential opportunities.**
- ▶ **Housing** – Growth is projected for overall housing units in both the potential Lewiston station study area by 0.8% and Androscoggin County by 1.7% (2021 – 2026), with the potential station study area accounting for 9.5% of all county housing in 2026, a marginal decline since 2010.
 - Owner households (occupied housing units) in the station study area are projected to increase 4.8%, more than the county which is projected to increase 3.4% by 2026. This is likely reflective of the growth in the 35 to 54 years age cohort.
 - Renter households (occupied housing units) are projected to decline for the study area and the county, by 0.1% (five units) and 1.6% respectively, by 2026. However, as reported by the Lewiston Office of Economic and Community

Development⁹ there are 512 new units (inclusive of 140 student housing units) proposed and in the pipeline.

- ▶ **Owner Home Values** - Despite projected growth in both the median value and average value of owner housing within the station study area, both are comparatively low when contrasted to values countywide. **This may present challenges to encourage additional owner residential development in the station study area that is both affordable to residents while also being financially viable for developers, who could pursue development opportunities throughout the county instead.**
- ▶ **Incomes** –Median household income and per capita income measures are well below those countywide, despite projected growth within the station study area. **Residents within the station study area could therefore find it challenging to afford new homes, and if they did, it would likely impact their disposable income spending potential.**
- ▶ **Business Diversity (2021)** – Business and employment within the station study area is concentrated in the service sector at 50.3%. **Along with the retail sector, such jobs are generally lower paying when compared to other sectors and may further present affordability constraints to home ownership.**

⁹ An e-mail memorandum dated May 3, 2022.

Table 1 Potential Lewiston Station - Selected Comparative Socio-Economic Metrics

Selected Comparative Metrics	Potential Lewiston Station Area ¹				Androscoggin County				Lewiston as % of County		
	2010	2021	2026	% Δ 2021-2026	2010	2021	2026	% Δ 2021-2026	2010	2021	2026
Total Population	9,326	9,607	9,647	0.4	107,702	110,157	111,367	1.1	8.7	8.7	8.7
Aged 20 to 34	2,426	2,417	2,374	-1.8	19,926	20,555	19,747	-3.9	12.2	11.8	12.0
Aged 35 to 54	2,196	1,989	2,026	1.9	31,470	27,462	27,221	-0.9	7.0	7.2	7.4
Aged 65 and older	1,016	1,325	1,438	8.5	15,184	20,660	23,419	13.4	6.7	6.4	6.1
Median age	31.3	32.5	33.4	2.9	39.8	41.7	42.5	1.9	78.7	77.9	78.7
Total Housing Units	4,807	4,874	4,914	0.8	49,090	50,907	51,761	1.7	9.8	9.6	9.5
Owner households	471	438	459	4.8	28,544	29,178	30,183	3.4	1.7	1.5	1.5
Renter households	3,707	3,720	3,715	-0.1	15,771	16,731	16,470	-1.6	23.5	22.2	22.6
Owner Median Value	N-A	\$106,913	\$133,453	24.8	N-A	\$186,029	\$256,839	38.1	N-A	57.5	52.0
Owner Average Value	N-A	\$128,704	\$158,408	23.1	N-A	\$223,163	\$295,945	32.6	N-A	57.7	53.5
Median Household \$	N-A	\$23,747	\$26,229	10.5	N-A	\$57,448	\$64,252	11.8	N-A	41.3	40.8
Per Capita \$	N-A	\$15,000	\$16,662	11.1	N-A	\$31,310	\$35,333	12.8	N-A	47.9	47.2
	Firms	Employees	Emp/Firm	% Of Firms	Firms	Employees	Emp/Firm	% Of Firms	Firms	Emp	Emp/Firm
Totals (2021)	495	7,803	15.8	100.0	3,773	53,446	14.2	100.0	13.1	14.6	111.3
Retail sector	77	875	11.4	15.6	860	11,206	13.0	22.8	9.0	7.8	87.2
Office sector	51	924	18.1	10.3	348	3,552	10.2	9.2	14.7	26.0	177.5
Service sector	249	4,343	17.4	50.3	1,495	23,342	15.6	39.6	16.7	18.6	111.7
Manufacturing sector	22	864	39.3	4.4	151	5,965	39.5	4.0	14.6	14.5	99.4
Other	96	797	8.3	19.4	919	9,381	10.2	24.4	10.4	8.5	81.3

Source: Esri and RKG (2022)

(1) 15-minute walk time about the potential station location

N-A - Data suppressed or otherwise unreported

Residential Development Potential

By 2026, it is estimated residential development potential in the Lewiston station study area may increase as a share of the county development (see Table 2)¹⁰.

The increase factors used in this analysis were set higher for renter housing (1.25% and 1.35%) than owner housing (1.15% and 1.25%). The slightly greater expectation for renter housing development potential takes into consideration the possibility for smaller units compared to owner housing, and the subsequent potential for increased development units per acre.

In both instances, the base assumption is that given new housing choices, proximity to commuter rail and potential for additional non-residential development and amenities could work together to enhance location desirability of the study area. Another assumption is that any new residential development in the study area would be positioned to effectively target the wider countywide population change, especially in targeted population age cohorts¹¹.

Table 2 Potential Lewiston Station - Estimated Residential Development Potential

Lewiston Station Study Area 2021 - 2026 Residential	Baseline # of Units	Low Estimate¹	High Estimate²
Total Housing Units	16	116	158
Owner households	21	28	32
Renter households	(5)	88	125

Source: Esri and RKG (2022)

(1) Increase 2026 representation of county by 1.15% for owner and 1.25% for renter

(2) Increase 2026 representation of county by 1.25% for owner and 1.35% for renter

Retail Demand and Sales Comparisons

Estimated household spending demand for households within the study area, and sales for selected store types were reviewed for retail comparisons (see Table 3). These store types often require smaller footprints in terms of square feet and generally reflect neighborhood or other convenience retail as opposed to anchor or destination retail with larger footprints. By comparing demand against sales, an estimate of sales leakage is indicated, meaning where local store sales either exceed (import) or fall short (export) of local spending demand – or consumers are shopping outside of the study area. In either instance there may be opportunities for new development either to build on an existing strength, import, or recapture sales leakage, export.

¹⁰ It should be noted that the summary reasoning and assumptions presented in this section are applicable for all station areas and has not been repeated for each throughout the remainder of this report.

¹¹ Ultimately, additional residential development opportunities would depend on available land or land assemblages for such development, investor/developer interest and determinations of market and financial feasibility, and existing zoning regulations.

While levels of commuter ridership would add some measure of retail spending demand, these are generally nominal and would typically be considered as incremental to any retailer, in their location criteria process, when contrasted to the more stabilized and ongoing demand represented by area households.

For the Lewiston station area, restaurant sales are particularly strong, as they exceed local demand by nearly 140% and suggest the potential for additional restaurants to further the diversity and strength of this sector. Conversely, the sales leakage among other sectors may offer development potential.

Within the study area, the overall annual spending demand per household for the selected sectors is approximately \$327 as compared against \$1,331 countywide.

Table 3 Potential Lewiston Station - Selected Retail Demand and Sales Comparisons

Selected Retail Sector Comparative Metrics (in \$1,000's)	Lewiston Station ¹			Androscoggin County			Auburn as % of County	
	Demand	Sales	Import (Export)	Demand	Sales	Import (Export)	Demand	Sales
Total	\$8,205.0	\$14,808.3	\$6,603.3	\$174,595.6	\$233,168.7	\$48,573.1	4.7%	6.6%
Specialty food stores ²	\$737.5	\$0.0	(\$737.5)	\$15,084.3	\$63,266.6	\$48,182.4	4.9%	0.0%
Secondhand stores ³	\$420.9	\$0.0	(\$420.9)	\$9,245.0	\$7,995.9	(\$1,249.1)	4.6%	0.0%
Other specialty retail ⁴	\$1,254.5	\$975.5	(\$279.0)	\$28,077.5	\$14,553.9	(\$13,523.6)	4.5%	6.7%
Restaurants ⁵	\$5,792.1	\$13,832.8	\$8,040.7	\$122,188.9	\$137,352.3	\$15,163.5	4.7%	10.1%

Source: Esri and RKG (2022)

- (1) 15-minute walk time about the potential station location
- (2) Includes meat and fish markets, produce, bakeries and confectioneries and nuts as example
- (3) Includes used merchandise, consignment shops and charitable thrift stores as examples
- (4) Includes pet supply stores, tobacco shops and generally unspecified other as examples
- (5) Includes full-service, limited-service, cafeterias, and snack vendors as examples

Residential Pipeline

Information offered by the Lewiston Office of Economic and Community Development¹² noted that there several residential development projects either proposed or in the pipeline in proximity to the potential Lewiston station area. These are depicted in Figure 3 and include the following projects:

¹² An e-mail memorandum dated May 3, 2022.

- ▶ **245 renter units**, a mix of studio and one bedroom, targeted to hospital staff and young professionals. The proposed project is estimated to be within a 10-minute walk of the Lewiston station site. Due to impacts associated with COVID-19, the project is currently on hold, pending resolution of construction and financing capacities.
- ▶ **140 renter units**, targeted to serve as student housing for the Maine College of Health Professionals. Reportedly, the landowner is currently seeking interested developers although no construction is underway at this time.
- ▶ **Picker House Lofts**, a proposed 72 units of mixed income housing, situated at the corner of Cedar and Oxford Streets, approximately one mile from the Lewiston station site, just beyond the 15-minute walking distance. This project is part of the more expansive Continental Mill complex under separate ownership, where reportedly there are unspecified plans to develop several hundred workforce housing units.
- ▶ **92 units of mixed income housing**, just east of Kennedy Park and within the Lewiston station area. Reportedly, the first phase of development is to include 74-units, with half of the units as new housing and half of the units as replacement of older, existing, Section 8 housing.

In summary, the above reported pipeline development represents 512 new residential units within the Lewiston station area. This includes 140 units of proposed student housing. An additional 37 units represent a replacement of existing inventory.

This reported pipeline inventory runs counter to the previously projected decline of renter residential within the Lewiston station area (2021 - 2026). The pipeline units are not reflected in the 2021 to 2026 projections as offered by Esri (refer to Table 1).

Figure 3 Lewiston Station Area Pipeline Residential Development (15-Minute Walk Time)



Selected Comparative Socio-Economic Metrics

Comparative metrics for the Auburn station area (3-mile radius) and Androscoggin County are summarized in Table 4, noting the following:

- ▶ **Population** – Population growth is projected over the 2021 to 2026 period, by 0.9% for the Auburn station study area and 1.1% for Androscoggin County. During this time frame, the population of the study area remains constant in terms of its representation of the county population.
 - The 20 to 34 years age cohort population is projected to decline both for the study area by 10.3% and by 3.9% countywide.
 - The 35 to 54 years age cohort population is projected to decline both for the study area by 3.4% and the county area by 0.9%, with the study area realizing a decline in its countywide representation.
 - The 65 years and older age cohort population is projected to increase to 23.0% for the study area and to 21.0% for the county. By 2026, the 65+ cohort population in the study area is projected to increase to 5.0% of the county population.
- ▶ **Housing** – Growth is projected for overall housing units in both the Auburn station study area by 1.5% and Androscoggin County by 1.7% (2021 – 2026), with the station study area holding steady at 4.4% of all county housing in 2026.
 - Owner households (occupied housing units) in the station study area are projected to increase 3.1% to a total of 80.0%, while the county is projected to increase 3.4% to a total of 64.0%, by 2026.
 - Renter households (occupied housing units) are projected to decline by 4.4% for the study area and 1.6% for the county by 2026. **This may indicate renter residential development opportunities, considering the increasing population in the 65+ cohort.**
- ▶ **Owner Home Values** – The median and average values of owner housing are projected to increase in the station study area and the county, and the median and average values of owner housing in the study area are greater than countywide.
- ▶ **Incomes** – Median household income and per capita income levels are both projected to increase for the study area and the county. Despite a smaller increase in median household income in the study area at 8.4% compared to 11.8% for the county, the study area median household income is more than 30.0% greater than that countywide. Per capita income in the study area also exceeds the county by 30.0% with both **suggesting a likely greater disposable income spending potential in the study area.**
- ▶ **Business Diversity (2021)** – Businesses and employment are generally well diversified for the Auburn station study area and Androscoggin County, although they are **dominated by the retail and service sectors.** Approximately 52.0% of study area businesses and 62.0% of county businesses are concentrated in the retail and services sectors. Additionally, 37.0% of the study area employment and 65.0% of the countywide employment is in these sectors, **which are generally lower paying when compared to other sectors.**

Table 4 Potential Auburn Park and Ride Station - Selected Comparative Socio-Economic Metrics

Selected Comparative Metrics	Potential Auburn Park and Ride Station ¹				Androscoggin County				Auburn as % of County		
	2010	2021	2026	% Δ 2021-2026	2010	2021	2026	% Δ 2021-2026	2010	2021	2026
Total Population	5,074	5,060	5,105	0.9%	107,702	110,157	111,367	1.1%	4.7	4.6	4.6
Aged 20 to 34	795	721	647	-10.3%	19,926	20,555	19,747	-3.9%	4.0	3.5	3.3
Aged 35 to 54	1,635	1,418	1,370	-3.4%	31,470	27,462	27,221	-0.9%	5.2	5.2	5.0
Aged 65 and older	698	994	1,160	16.7%	15,184	20,660	23,419	13.4%	4.6	4.8	5.0
Median age	42.2	45.3	46.8	3.3%	39.8	41.7	42.5	1.9%	106.0	108.6	110.1
Total Housing Units	2,194	2,263	2,298	1.5%	49,090	50,907	51,761	1.7%	4.5	4.4	4.4
Owner households	1,651	1,675	1,727	3.1%	28,544	29,178	30,183	3.4%	5.8	5.7	5.7
Renter households	429	455	435	-4.4%	15,771	16,731	16,470	-1.6%	2.7	2.7	2.6
Owner Median Value	N-A	\$208,182	\$298,295	43.3%	N-A	\$186,029	\$256,839	38.1%	N-A	111.9	116.1
Owner Average Value	N-A	\$253,729	\$352,606	39.0%	N-A	\$223,163	\$295,945	32.6%	N-A	113.7	119.1
Median Household \$	N-A	\$79,453	\$86,117	8.4%	N-A	\$57,448	\$64,252	11.8%	N-A	138.3	134.0
Per Capita \$	N-A	\$40,890	\$46,412	13.5%	N-A	\$31,310	\$35,333	12.8%	N-A	130.6	131.4
	Firms	Employees	Emp/Firm	% Firms	Firms	Employees	Emp/Firm	% Firms	Firms	Emp	Emp/Firm
Totals (2021)	303	6,299	20.8	100.0%	3,773	53,446	14.2	100.0%	8.0	11.8	146.8
Retail sector	61	560	9.2	20.1%	860	11,206	13.0	22.8%	7.1	5.0	70.5
Office sector	15	93	6.2	5.0%	348	3,552	10.2	9.2%	4.3	2.6	60.7
Service sector	95	1,769	18.6	31.4%	1,495	23,342	15.6	39.6%	6.4	7.6	119.3
Manufacturing sector	31	2,228	71.9	10.2%	151	5,965	39.5	4.0%	20.5	37.4	181.9
Other	101	1,649	16.3	33.3%	919	9,381	10.2	24.4%	11.0	17.6	159.9

Source: Esri and RKG (2022)

(1) 3-mile radius about the potential station location

N-A - data suppressed or otherwise unreported

Residential Development Potential

Estimated residential development potential for the Auburn station area is indicated in Table 5. **Note that renter residential opportunities could be enhanced if such development is targeted to the growth in the 65+ age cohort.**

Table 5 Potential Auburn Park and Ride - Estimated Residential Development Potential

Potential Auburn Park and Ride Station Study Area 2021 - 2026 Residential	Baseline # of Units	Low Estimate ¹	High Estimate ²
Total Housing Units	32	69	90
Owner households	52	78	95
Renter households	(20)	(9)	(5)

Source: Esri and RKG (2022)

(1) Increase 2026 representation of county by 1.15% for owner and 1.25% for renter

(2) Increase 2026 representation of county by 1.25% for owner and 1.35% for renter

Retail Demand and Sales Comparisons

Retail demand and sales comparative metrics for the potential Auburn Park and Ride station area and the county are detailed in Table 6, noting:

- ▶ Secondhand stores – sales leakage in the study area countywide and indicating some **potential for additional store development to recapture sales leakage.**
- ▶ Specialty Food Stores – strong sales in the study area, exceeding demand by 173.0% percent and **indicating a strength which could be further developed.**
- ▶ Other Specialty Stores – sales exceed demand in the study area by 292.0% and represent a **strength and destination draw for this retail sector in the study area** which could be further exploited.

Overall annual per household spending demand among these sectors is approximately \$1,504 in the study area, or 113.0% of the countywide demand of \$1,331 in the same sectors.

Table 6 Potential Auburn Park and Ride - Selected Retail Demand and Sales Comparisons

Selected Retail Sector Comparative Metrics (in \$1,000's)	Potential Auburn Park and Ride Station ¹			Androscoggin County			Auburn as % of County	
	Demand	Sales	Import (Export)	Demand	Sales	Import (Export)	Demand	Sales
Total	\$9,352.0	\$15,864.1	\$6,512.1	\$174,595.6	\$223,168.7	\$48,573.1	5.4%	7.1%
Specialty food stores ²	\$798.5	\$2,181.9	\$1,383.4	\$15,084.3	\$63,266.6	\$48,182.4	5.3%	3.4%
Secondhand stores ³	\$503.9	\$0.0	(\$503.9)	\$9,245.0	\$7,995.9	(\$1,249.1)	5.5%	0.0%
Other specialty retail ⁴	\$1,498.2	\$5,870.5	\$4,372.3	\$28,077.5	\$14,553.9	(\$13,523.6)	5.3%	40.3%
Restaurants ⁵	\$6,551.5	\$7,811.7	\$1,260.3	\$122,188.9	\$137,352.3	\$15,163.5	5.4%	5.7%

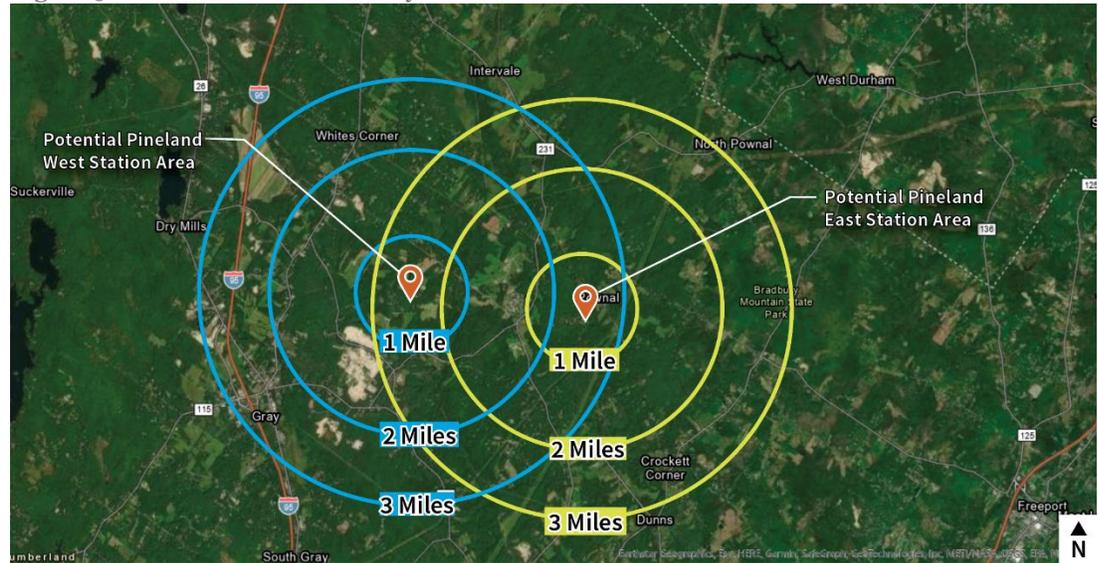
Source: Esri and RKG (2022)

- (1) 3-mile radius about the potential station area
- (2) includes meat and fish markets, produce, bakeries and confectioneries and nuts as example
- (3) includes used merchandise, consignment shops and charitable thrift stores as examples
- (4) includes pet supply stores, tobacco shops and generally unspecified other as examples
- (5) includes full-service, limited-service, cafeterias, and snack vendors as examples

1.2.2.3 Potential Pineland Station Areas

To assess potential economic impact and development around the Pineland area, a potential station area was selected along each alignment alternative within proximity to Pineland. Both have similar characteristics and rural surroundings. The potential Pineland East station area location is situated along state-owned St. Lawrence and Atlantic Railroad (SLR) corridor and the potential Pineland West station area is situated along the Pan Am Railroad (PAR) corridor. The analysis for each is presented, independently, in this section – noting that there is significant geographic overlap of the appropriate 3-mile radius study area for each, visible in Figure 5.

Figure 5 Pineland Station Study Areas - West and East



1.2.2.3.1 Potential Pineland West Station Area

The potential Pineland West station area is in a rural setting, located along the PAR corridor.

Selected Comparative Socio-Economic Metrics

Comparative metrics for the potential Pineland West station area (3-mile radius) and Cumberland County are presented in Table 7, noting the following:

- ▶ **Population** – Population growth is projected over the 2021 to 2026 time-period, at relatively similar rates for the Pineland West station study area and Cumberland County. Over that time-period, the population of the study area remains constant at representing 1.4% of the county population.
 - The 20 to 34 years age cohort population is projected to decline for the study area by 2.8% while the countywide population is projected to grow by 3.4%. As result, the study area’s representation of the county population of this cohort declines slightly from 1.3% to 1.2% by 2026.

- The 35 to 54 years age cohort population is projected to grow both for the study area by 2.9% and countywide by 2.0%, with the study area holding constant in its countywide representation.
- The 65 and older age cohort population is projected to grow for the study area by 25.5% and countywide by 18.6%. By 2026, the 65+ cohort is projected to account for 19.0% of the study area population and 22.0% for the county population. As a result, in 2026, the 65+ cohort population in the study area is projected to increase to 1.2% of the county population in this cohort.
- ▶ **Housing** – Growth is projected for overall housing units by 4.5% in both the Pineland West station study area and Cumberland County 4.5% (2021 – 2026).
 - Owner households (occupied housing units) in the study area are projected to increase by 6.5% to a total of 81.0%, the county is projected to increase by 6.3% to a total of 70.0%.
 - Renter households (occupied housing units) are projected to decline for the study area by 1.2%, but increase countywide, by 1.9%. **Noting the growth in the 65+ cohort in the study area, there may be possibilities for additional rental housing or owner condominiums targeted to this demographic.**
- ▶ **Owner Home Values** – The projected median value of owner housing within the station study area at 12.5% is somewhat less than the county, at 16.5%. However, the rate of growth in the average value of owner housing in the study area is projected at 24.2% as compared to 14.3% countywide. Despite the growth in these values for the study area, both median and average remain lower for the county.
- ▶ **Incomes** – Median household income and per capita income levels are projected to increase for the study area and the county, at similar rates. The median household income for the study area is marginally greater when compared to the county.
- ▶ **Business Diversity (2021)** – Business and employment within the Pineland West station study area are generally well diversified and are **concentrated in the retail and service sectors** – 56.0% of study area businesses and 64.0% of Cumberland County businesses. 58.0% of the study area and 67% of the countywide employment are in these sectors, which are **generally lower paying when compared to other sectors.**

Table 7 Potential Pineland West Station Area - Selected Comparative Socio-Economic Metrics

Selected Comparative Metrics	Potential Pineland West Station Area ¹				Cumberland County				Pineland West as % of County		
	2010	2021	2026	% Δ 2021-2026	2010	2021	2026	% Δ 2021-2026	2010	2021	2026
Total Population	3,882	4,151	4,344	4.6%	281,674	302,496	316,170	4.5%	1.4%	1.4%	1.4%
Aged 20 to 34	688	717	697	-2.8%	51,766	56,538	58,444	3.4%	1.3%	1.3%	1.2%
Aged 35 to 54	1,299	1,154	1,187	2.9%	85,001	77,187	78,702	2.0%	1.5%	1.5%	1.5%
Aged 65 and older	367	664	831	25.2%	40,157	59,459	70,494	18.6%	0.9%	1.1%	1.2%
Median age	39.4	41.3	41.9	1.5%	41.0	43.4	43.9	1.2%	96.1%	95.2%	95.4%
Total Housing Units	1,631	1,778	1,858	4.5%	138,657	152,039	158,941	4.5%	1.2%	1.2%	1.2%
Owner households	1,195	1,332	1,419	6.5%	78,545	87,505	93,010	6.3%	1.5%	1.5%	1.5%
Renter households	344	335	331	-1.2%	38,794	39,760	40,509	1.9%	0.9%	0.8%	0.8%
Owner Median Value	N-A	\$265,782	\$298,875	12.5%	N-A	\$322,496	\$375,747	16.5%	N-A	82.4%	79.5%
Owner Average Value	N-A	\$295,796	\$367,254	24.2%	N-A	\$381,894	\$436,549	14.3%	N-A	77.5%	84.1%
Median Household \$	N-A	\$78,672	\$86,809	10.3%	N-A	\$76,604	\$85,662	11.8%	N-A	102.7	101.3
Per Capita \$	N-A	\$38,740	\$43,199	11.5%	N-A	\$43,854	\$49,337	12.5%	N-A	88.3%	87.6%
	Firms	Employees	Emp/Firm	% of Firms	Firms	Employees	Emp/Firm	% of Firms	Firms	Emp	Emp/Firm
Totals (2021)	214	1,594	7.4	100.0%	14,042	197,591	14.1	100.0%	1.5%	0.8%	52.9%
Retail sector	35	240	6.9	16.4%	3,004	40,345	13.4	21.4%	1.2%	0.6%	51.1%
Office sector	18	124	6.9	8.4%	1,340	16,922	12.6	9.5%	1.3%	0.7%	54.6%
Service sector	84	681	8.1	39.3%	5,916	91,545	15.5	42.1%	1.4%	0.7%	52.4%
Manufacturing sector	10	80	8.0	4.7%	420	9,703	23.1	3.0%	2.4%	0.8%	34.6%
Other	67	469	7.0	31.3%	3,362	39,076	11.6	23.9%	2.0%	1.2%	60.2%

Source: Esri and RKG (2022)

(1) 3-mile radius about the potential station location

N-A - data suppressed or otherwise unreported

Residential Development Potential

Residential development potential for the potential Pineland West station area is indicated in Table 8. While the renter housing opportunities remain negligible, **the growth in the 65+ cohort throughout the study area and the county could translate into demand for new renter housing as opposed to owner housing, assuming development of owner condominiums to otherwise attract this demographic.**

Table 8 Potential Pineland West Station Area - Estimated Residential Development Potential

Potential Pineland West Station Study Area 2021 - 2026 Residential	Baseline # of Units	Low Estimate ¹	High Estimate ²
Total Housing Units	83	113	130
Owner households	87	108	122
Renter households	(4)	4	8

Source: Esri and RKG (2022)

(1) Increase 2026 representation of county by 1.15% for owner and 1.25% for renter

(2) Increase 2026 representation of county by 1.25% for owner and 1.35% for renter

Retail Demand and Sales Comparisons

Retail demand and sales comparative metrics for the potential Pineland West station area and the county are detailed in Table 9, noting:

- ▶ Secondhand stores – there is sales leakage in the study area, which may suggest some opportunity for additional retail in this sector however, the county is a net importer of more than \$13.0 million suggesting that the study area may not be a competitive location.
- ▶ Similar observations are present for Other Specialty Retail and Restaurants, whereby there is sales leakage in the study area, but the county is an overall net importer.
- ▶ Specialty Food Stores – **sales exceed demand in the study area by 455% and represent a strength and destination draw for this retail sector in the study area which could be further exploited.**

Overall annual per household spending demand among these sectors is heavily influenced by restaurant demand - approximately \$5,622 in the study area as compared with \$13,928, about 40% of the county overall.

Table 9 Potential Pineland West Station Area - Selected Retail Demand and Sales Comparisons

Selected Retail Sector Comparative Metrics (in \$1,000's)	Potential Pineland West Station Area ¹			Cumberland County			Pineland West as % of County	
	Demand	Sales	Import (Export)	Demand	Sales	Import (Export)	Demand	Sales
Total	\$9,371.6	\$7,018.8	(\$2,352.8)	\$639,411.5	\$909,172.0	\$269,760.5	1.5%	0.8%
Specialty food stores ²	\$779.1	\$3,545.7	\$2,766.6	\$53,895.6	\$177,360.0	\$123,464.4	1.4%	2.0%
Secondhand stores ³	\$504.6	\$186.6	(\$318.0)	\$34,159.5	\$47,160.9	\$13,001.4	1.5%	0.4%
Other specialty retail ⁴	\$1,366.7	\$84.0	(\$1,282.7)	\$97,505.1	\$146,558.0	\$49,052.9	1.4%	0.1%
Restaurants ⁵	\$6,721.2	\$3,202.5	(\$3,518.7)	\$453,851.3	\$538,093.1	\$84,241.8	1.5%	0.6%

Source: Esri and RKG (2022)

- (1) 3-mile radius about the potential station location - Note that overlaps exist with Pineland East station location - reported in full with the overlap
- (2) includes meat and fish markets, produce, bakeries and confectioneries and nuts as example
- (3) includes used merchandise, consignment shops and charitable thrift stores as examples
- (4) includes pet supply stores, tobacco shops and generally unspecified other as examples
- (5) includes full-service, limited-service, cafeterias, and snack vendors as examples

1.2.2.3.2. Potential Pineland East Station Area

The potential Pineland East station area is located within a rural setting along the SLR corridor.

Selected Comparative Socio-Economic Metrics

Comparative metrics for the potential Pineland East station area (3-mile radius) and Cumberland County are presented in Table 10, noting the following:

- ▶ **Population** – Both the potential Pineland East station study area and the Cumberland County populations are projected to grow over the 2021 to 2026 time period at similar rates, with the study area accounting for 0.8% of the county population.
 - The 20 to 34 years age cohort population is projected to increase by 6.8%, a rate of growth greater than the 3.4% countywide.
 - In the 35 to 54 years age cohort population, the study area is projected to decline by 4.2% decline while the county increases by 2.0%.
 - The 65 and older age cohort population is projected to increase for the study area by 27.3% and for the county by 18.6%. **By 2026, the 65+ cohort is projected to account for 22.0% of the study area population as well as the county population.**
- ▶ **Housing** – Growth is projected for overall housing units by 4.5% in both the Pineland East station study area and Cumberland County (2021 – 2026).
 - Owner households (occupied housing units) in the study area are projected to increase by 5.8% to a total of 89.0%, while the county will see an increase by 6.2% to a total 70.0%.
 - Renter households (occupied housing units) are projected to decline for the study area by 0.9% and increase 1.9% countywide – possibly indicating renter residential or owner condominium) development opportunities in the study area considering the increasing population in the 65+ cohort within the study area.

- ▶ **Owner Home Values** – The median value and average value of owner housing are projected to increase in both the Pineland East station study area and Cumberland County, with the median values in the study area somewhat greater than the county.
- ▶ **Incomes** – Median household income and per capita income levels are projected to increase for the station study area and the county at similar rates. These values in the study area are greater than the same income metrics countywide. Median household incomes are particularly greater in the study area than countywide – **possibly indicative of a greater level of discretionary spending income in the station study area.**
- ▶ **Business Diversity (2021)** – Like the potential Pineland West station area, businesses and employment are both generally well diversified for the study area and the county. Also similar to the potential Pineland West station area is a **high concentration of firms and employment in the retail and service sectors which are generally lower paying when compared to other sectors.**

Table 10 Potential Pineland East Station Area- Selected Comparative Socio-Economic Metrics

Selected Comparative Metrics	Potential Pineland East Station Area ¹				Cumberland County				Pineland East as % of County		
	2010	2021	2026	% Δ 2021-2026	2010	2021	2026	% Δ 2021-2026	2010	2021	2026
Total Population	2,235	2,404	2,517	4.7%	281,674	302,496	316,170	4.5%	0.8%	0.8%	0.8%
Aged 20 to 34	290	397	424	6.8%	51,766	56,538	58,444	3.4%	0.6%	0.7%	0.7%
Aged 35 to 54	782	625	599	-4.2%	85,001	77,187	78,702	2.0%	0.9%	0.8%	0.8%
Aged 65 and older	224	433	551	27.3%	40,157	59,459	70,494	18.6%	0.6%	0.7%	0.8%
Median age	41.5	44.2	44.2	0.0%	41.0	43.4	43.9	1.2%	101.2%	101.8%	100.7%
Total Housing Units	910	998	1,042	4.4%	138,657	152,039	158,941	4.5%	0.7%	0.7%	0.7%
Owner households	745	827	875	5.8%	78,545	87,505	93,010	6.3%	0.9%	0.9%	0.9%
Renter households	119	114	113	-0.9%	38,794	39,760	40,509	1.9%	0.3%	0.3%	0.3%
Owner Median Value	N-A	\$328,125	\$374,061	14.0%	N-A	\$322,496	\$375,747	16.5%	N-A	101.7%	99.6%
Owner Average Value	N-A	\$359,522	\$410,584	14.2%	N-A	\$381,894	\$436,549	14.3%	N-A	94.1%	94.1%
Median Household \$	N-A	\$95,407	\$106,568	11.7%	N-A	\$76,604	\$85,662	11.8%	N-A	124.5%	124.4%
Per Capita \$	N-A	\$47,146	\$53,006	12.4%	N-A	\$43,854	\$49,337	12.5%	N-A	107.5%	107.4%
	Firms	Employees	Emp/Firm	% of Firms	Firms	Employees	Emp/Firm	% of Firms	Firms	Emp	Emp/Firm
Totals (2021)	91	591	6.5	100.0%	14,042	197,591	14.1	100.0%	0.6%	0.3%	46.2%
Retail sector	13	69	5.3	14.3%	3,004	40,345	13.4	21.4%	0.4%	0.2%	39.5%
Office sector	5	44	8.8	5.5%	1,340	16,922	12.6	9.5%	0.4%	0.3%	69.7%
Service sector	34	248	7.3	37.4%	5,916	91,545	15.5	42.1%	0.6%	0.3%	47.1%
Manufacturing sector	2	15	7.5	2.2%	420	9,703	23.1	3.0%	0.5%	0.2%	32.5%
Other	37	215	5.8	40.7%	3,362	39,076	11.6	23.9%	1.1%	0.6%	50.0%

Source: Esri and RKG (2022)

(1) 3-mile radius about the potential station location

N-A - data suppressed or otherwise unreported

Residential Development Potential

Estimated residential development potential for the Pineland East station study area is indicated in Table 11. **As with the potential Pineland West station area, while the renter housing opportunities remain negligible, the growth in the 65+ cohort (local and countywide) could translate into demand for new renter housing as opposed to owner housing, assuming development of owner condominiums to otherwise attract this demographic.**

Table 11 Potential Pineland East Station Area - Estimated Residential Development Potential

Potential Pineland East Station Study Area 2021 - 2026 Residential	Baseline # of Units	Low Estimate ¹	High Estimate ²
Total Housing Units	47	63	73
Owner households	48	61	70
Renter households	(1)	2	3

Source: Esri and RKG (2022)

(1) Increase 2026 representation of county by 1.15% for owner and 1.25% for renter

(2) Increase 2026 representation of county by 1.25% for owner and 1.35% for renter

Retail Demand and Sales Comparisons

Retail demand and sales comparative metrics for the potential Pineland East station area and the county are detailed in Table 12, noting:

- ▶ Secondhand stores and Specialty Food Stores – while both sectors are net importers of sales in the study area and county, the study area sales account for approximately 1.9% of the county sales, suggesting possible competitive location disadvantages.
- ▶ Restaurants – sales in the study area account for 8.0% of the study area demand, **indicating a locally underserved retail sector with some opportunities for additional development.**

Overall annual per household spending demand among these sectors is approximately \$6,147 in the study area as compared with \$13,928 (about 44% of the county overall).

Table 12 Potential Pineland East Station Area - Selected Retail Demand and Sales Comparisons

Selected Retail Sector Comparative Metrics (in \$1,000's)	Pineland East Station ¹			Cumberland County			Pineland East as % of Co.	
	Demand	Sales	Import (Export)	Demand	Sales	Import (Export)	Demand	Sales
Total	\$5,784.1	\$2,376.1	(\$3,408.1)	\$639,411.5	\$909,172.0	\$269,760.5	0.9%	0.3%
Specialty food stores ²	\$478.2	\$1,626.0	\$1,147.8	\$53,895.6	\$177,360.0	\$123,464.4	0.9%	0.9%
Secondhand stores ³	\$312.9	\$426.5	\$113.6	\$34,159.5	\$47,160.9	\$13,001.4	0.9%	0.9%
Other specialty retail ⁴	\$847.7	\$0.0	(\$847.7)	\$97,505.1	\$146,558.0	\$49,052.9	0.9%	0.0%
Restaurants ⁵	\$4,145.3	\$323.5	(\$3,821.8)	\$453,851.3	\$538,093.1	\$84,241.8	0.9%	0.1%

Source: Esri and RKG (2022)

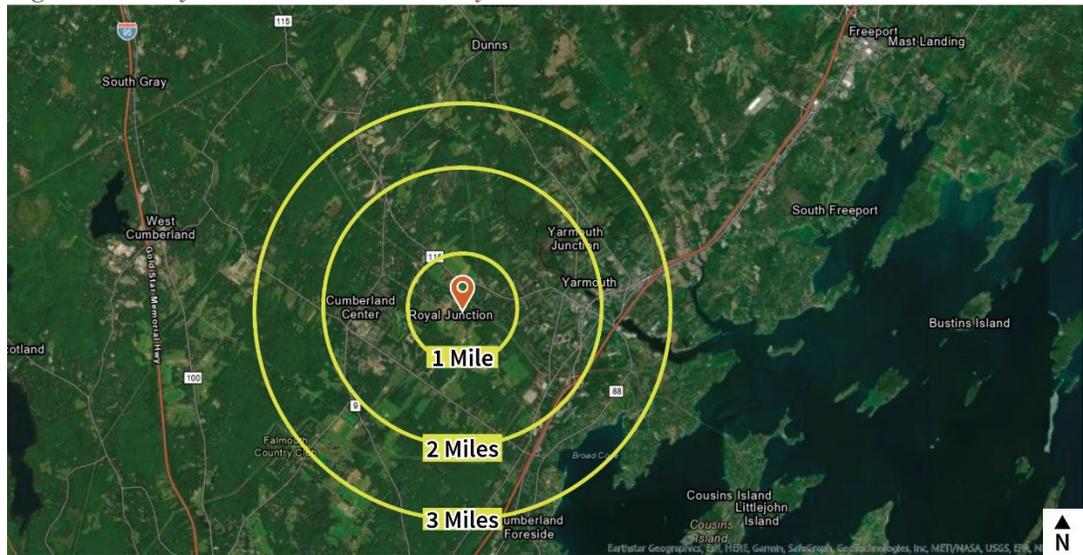
- (1) 3-mile radius about the potential station location - Note that overlaps exist with Pineland West station location - reported in full with the overlap
- (2) includes meat and fish markets, produce, bakeries and confectioneries and nuts as example
- (3) includes used merchandise, consignment shops and charitable thrift stores as examples
- (4) includes pet supply stores, tobacco shops and generally unspecified other as examples
- (5) includes full-service, limited-service, cafeterias, and snack vendors as examples

1.2.2.4 **Potential Royal Junction Station Area**

The Royal Junction station was removed from consideration in this study; however, its analysis is included throughout the report for reference.

This potential station area has rural surroundings and is aligned with the PAR corridor. The Royal Junction station¹⁵ study area is a 3-mile radius, depicted in Figure 6. This location has significant geographic overlap with the Yarmouth Junction station study area to the east¹⁶.

Figure 6 Royal Junction Station Study Area



Selected Comparative Socio-Economic Metrics

Comparative metrics for the potential Royal Junction station area (3-mile radius) and Cumberland County are presented in Table 13, noting the following:

- ▶ **Population** – Population growth is projected over the 2021 to 2026 time-period, by 4.1% for the potential Royal Junction station study area and 4.5% for Cumberland County, with the station study area accounting for 4.3% of the county population (2026).
 - The 20 to 34 years age cohort population is projected to increase by 16.0%, ahead of the county’s projected 3.4% growth.

¹⁵ Aligned with the existing Pan Am Railroad corridor.

¹⁶ The selected socio-economic and retail metrics for each site are presented in their entirety, inclusive of the overlap.

- In the 35 to 54 years age cohort population, the study area is projected to decline by 4.7%, contrasted to a countywide increase of 2.0% - **indicating a loss in the family and home buying population cohort in the study area, as well as those in their peak earning and spending years.**
- The 65 years and older age cohort population is projected to increase for the study area by 21.3% and the county by 18.6%. By 2026, the 65+ cohort is projected to account for 25.0% of the study area population and **may reflect opportunities for new housing targeting this demographic.**
- ▶ **Housing** – Growth is projected for overall housing units in the Royal Junction station study area by 4.0% and Cumberland County by 4.5% (2021 – 2026).
 - Owner households (occupied housing units) in the study area are projected to increase by 5.5% to a total of 82.0%, and in the county by 6.3% to a total of 70.0%.
 - Renter households (occupied housing units) are projected to decline for the study area by 0.5% and increase 1.9% countywide.
- ▶ **Owner Home Values** –The median value and average value of owner housing are projected to increase in the potential station study area and the county, with both the median and average values in the study area above those of the county.
- ▶ **Incomes** – Median household income and per capita income levels are projected to increase for the study area and the county at similar rates. These values in the study area are greater than the same income metrics countywide.
- ▶ **Business Diversity (2021)** – Businesses and employment are generally well diversified for the study area and the county, and are somewhat similar among the industry sectors, **noting a high concentration of firms and employment in the retail and service sectors – both exceeding 65% of the total employment for each.**

Table 13 Potential Royal Junction Station Area - Selected Comparative Socio-Economic Metrics

Selected Comparative Metrics	Royal Junction Station ¹				Cumberland County				Royal Junction as % of County		
	2010	2021	2026	% Δ 2021-2026	2010	2021	2026	% Δ 2021-2026	2010	2021	2026
Total Population	12,381	13,088	13,620	4.1%	281,674	302,496	316,170	4.5%	4.4	4.3	4.3
Aged 20 to 34	1,193	1,727	2,004	16.0%	51,766	56,538	58,444	3.4%	2.3	3.1	3.4
Aged 35 to 54	4,058	3,221	3,069	-4.7%	85,001	77,187	78,702	2.0%	4.8	4.2	3.9
Aged 65 and older	1,894	2,860	3,470	21.3%	40,157	59,459	70,494	18.6%	4.7	4.8	4.9
Median age	45.1	48.5	49.3	1.6%	41.0	43.4	43.9	1.2%	110.0	111.8	112.3
Total Housing Units	5,238	5,686	5,914	4.0%	138,657	152,039	158,941	4.5%	3.8	3.7	3.7
Owner households	3,918	4,287	4,523	5.5%	78,545	87,505	93,010	6.3%	5.0	4.9	4.9
Renter households	1,054	1,024	1,019	-0.5%	38,794	39,760	40,509	1.9%	2.7	2.6	2.5
Owner Median Value	N-A	\$407,076	\$453,787	11.5%	N-A	\$322,496	\$375,747	16.5%	N-A	126.2	120.8
Owner Average Value	N-A	\$468,664	\$507,902	8.4%	N-A	\$381,894	\$436,549	14.3%	N-A	122.7	116.3
Median Household \$	N-A	\$104,968	\$116,093	10.6%	N-A	\$76,604	\$85,662	11.8%	N-A	137.0	135.5
Per Capita \$	N-A	\$56,699	\$62,857	10.9%	N-A	\$43,854	\$49,337	12.5%	N-A	129.3	127.4
	Firms	Employees	Emp/Firm	% of Firms	Firms	Employees	Emp/Firm	% of Firms	Employees	Emp/Firm	% of Firms
Totals (2021)	557	5,438	9.8	100.0%	14,042	197,591	14.1	100.0%	4.0	2.8	69.4
Retail sector	102	1,165	11.4	18.3%	3,004	40,345	13.4	21.4%	3.4	2.9	85.0
Office sector	45	298	6.6	8.1%	1,340	16,922	12.6	9.5%	3.4	1.8	52.4
Service sector	240	2,388	10.0	43.1%	5,916	91,545	15.5	42.1%	4.1	2.6	64.3
Manufacturing sector	17	230	13.5	3.1%	420	9,703	23.1	3.0%	4.0	2.4	58.6
Other	153	1,357	8.9	27.5%	3,362	39,076	11.6	23.9%	4.6	3.5	76.3

Source: Esri and RKG (2022)

(1) 3-mile radius about the potential station location - Note that overlaps exist with Yarmouth Junction station location - reported in full with the overlap

N-A - Data suppressed or otherwise unreported

Residential Development Potential

Estimated residential development potential for the Royal Junction station area is indicated in Table 14. The potential for owner housing could exceed the capacity of available land to support such development. **Considering the lack of available land, more densely developed owner condominiums may be more appropriate, targeted to specific age cohorts. However, input from the study committee indicated this is not the type of preferred development within this potential station area.**

Table 14 Potential Royal Junction Station Area - Estimated Residential Development Potential

Potential Royal Junction Station Study Area 2021 - 2026 Residential	Baseline # of Units	Low Estimate ¹	High Estimate ²
Total Housing Units	231	324	380
Owner households	236	304	349
Renter households	(5)	20	31

Source: Esri and RKG (2022)

(1) Increase 2026 representation of county by 1.15% for owner and 1.25% for renter

(2) Increase 2026 representation of county by 1.25% for owner and 1.35% for renter

Retail Demand and Sales Comparisons

Retail demand and sales comparative metrics for the potential Royal Junction station area and the county are detailed in Table 15, noting:

- ▶ Significant sales leakage is projected across all industry sectors in the study area, with total sales accounting for 53.0% of the study area demand. **As a result, there may be opportunities for additional retail development in the study area, cautioning that for all sectors, the county is a net importer of such sales¹⁷.**

Overall annual per household spending demand among these sectors is approximately \$7,171 in the study area as compared with \$13,928 (about 51.0% of the county overall).

¹⁷ Opportunities in the study area will be influenced by store and site-specific parameters.

Table 15 Potential Royal Junction Station Area - Selected Retail Demand and Sales Comparisons

Selected Retail Sector Comparative Metrics (in \$1,000's)	Potential Royal Junction Station Area ¹			Cumberland County			Royal Junction as % of Co.	
	Demand	Sales	Import (Export)	Demand	Sales	Import (Export)	Demand	Sales
Total	\$38,083.7	\$20,153.1	(\$17,930.6)	\$639,411.5	\$909,172.0	\$269,760.5	6.0%	2.2%
Specialty food stores ²	\$3,133.0	\$875.5	(\$2,257.5)	\$53,895.6	\$177,360.0	\$123,464.4	5.8%	0.5%
Secondhand stores ³	\$2,079.8	\$1,606.3	(\$473.5)	\$34,159.5	\$47,160.9	\$13,001.4	6.1%	3.4%
Other specialty retail ⁴	\$5,539.5	\$3,726.7	(\$1,812.8)	\$97,505.1	\$146,558.0	\$49,052.9	5.7%	2.5%
Restaurants ⁵	\$27,331.4	\$13,944.6	(\$13,386.7)	\$453,851.3	\$538,093.1	\$84,241.8	6.0%	2.6%

Source: Esri and RKG (2022)

- (1) 3-mile radius about the potential station area - Note that overlaps exist with Yarmouth Junction station area - reported in full with the overlap
- (2) includes meat and fish markets, produce, bakeries and confectioneries and nuts as example
- (3) includes used merchandise, consignment shops and charitable thrift stores as examples
- (4) includes pet supply stores, tobacco shops and generally unspecified other as examples
- (5) includes full-service, limited-service, cafeterias, and snack vendors as examples

1.2.2.5 Potential Yarmouth Junction Station Area

The potential Yarmouth Junction station area has rural surroundings and is aligned with the SLR corridor. The study area for the Yarmouth Junction station site¹⁸ is a 3-mile radius, depicted in Figure 7 and includes downtown Yarmouth. While there is significant geographic overlap with the potential Royal Junction station area to the west (see Figure 8¹⁹), selected socio-economic and retail metrics for the potential Yarmouth Junction station area are offered in their entirety, inclusive of any overlap.

Figure 7 Potential Yarmouth Junction Station Study Area



Figure 8 Potential Royal Junction & Yarmouth Junction - Station Study Areas Overlap



¹⁸ Aligned with the existing state-owned St. Lawrence and Atlantic Railroad corridor.

¹⁹ The Royal Junction station was removed from consideration in this study, its analysis is included throughout the report for reference.

Selected Comparative Socio-Economic Metrics

Comparative metrics for the potential Yarmouth Junction station area (3-mile radius) and Cumberland County are detailed in Table 16, noting the following:

- ▶ **Population** – Population growth is projected over the 2021 to 2026 time-period, by 3.1% for the potential Yarmouth station study area and 4.5% for Cumberland County, with the study area accounting for 3.9% of the county population in 2026, a slight decline.
 - The 20 to 34 years age cohort population is projected to increase by 16.2%, more than the projected 3.4% growth countywide. As a result, the study area representation of this population to the county increases to 3.4% by 2026.
 - In the 35 to 54 years age cohort population, the study area is projected to decline by 5.9%, with the county increasing by 2.0%– **indicating a study area decline in the family formation and home buying cohort.**
 - The 65 years and older age cohort population is projected to increase for the study area and the county at similar percentages by 27.3% for the study area and 18.6% countywide. By 2026, the 65+ cohort is projected to account for 25.0% of the study area population and 22.0% countywide.
- ▶ **Housing** – Growth is projected for overall housing units in both the Yarmouth Junction station study area by 3.1% and Cumberland County by 4.5% (2021 – 2026).
 - Owner households (occupied housing units) in the study area are projected to increase by 4.6% and for the county by 6.3%. By 2026, the owner housing rate in the study area is projected to be 78.0% as compared with 70.0% countywide.
 - Renter households (occupied housing units) are projected to decline for the study area by 0.4% and increase countywide 1.9%.
- ▶ **Owner Home Values** – The median value and average value of owner housing are projected to increase in the study area and the county, with the median values in the study area somewhat greater than the county.
- ▶ **Incomes** – Median household income and per capita income levels are both projected to increase for the potential Yarmouth Junction station study area and Cumberland County at similar rates. These values in the study area, 20.0% for median household income and 15.0% for per capita income, are greater than the same income metrics countywide.
- ▶ **Business Diversity (2021)** – Businesses and employment are generally well diversified for the study area and the county and are represented in similar proportions. **As has been indicated for many of the other station locations, there is a high concentration of firms and employment in the retail and service sectors which are generally lower paying when compared to other sectors.**

Table 16 Potential Yarmouth Junction Station Area - Selected Comparative Socio-Economic Metrics

Selected Comparative Metrics	Potential Yarmouth Junction Station Area ¹				Cumberland County				Yarmouth Junction as % of County		
	2010	2021	2026	% Δ 2021-2026	2010	2021	2026	% Δ 2021-2026	2010	2021	2026
Total Population	11,590	11,999	12,374	3.1%	281,674	302,496	316,170	4.5%	4.1%	4.0%	3.9%
Aged 20 to 34	1,242	1,696	1,970	16.2%	51,766	56,538	58,444	3.4%	2.4%	3.0%	3.4%
Aged 35 to 54	3,722	2,961	2,786	-5.9%	85,001	77,187	78,702	2.0%	4.4%	3.8%	3.5%
Aged 65 and older	1,804	2,649	3,128	18.1%	40,157	59,459	70,494	18.6%	4.5%	4.5%	4.4%
Median age	45.2	48.3	49.0	1.4%	41.0	43.4	43.9	1.2%	110.2%	111.3%	111.6%
Total Housing Units	5,014	5,334	5,502	3.1%	138,657	152,039	158,941	4.5%	3.6%	3.5%	3.5%
Owner households	3,566	3,822	3,999	4.6%	78,545	87,505	93,010	6.3%	4.5%	4.4%	4.3%
Renter households	1,171	1,142	1,137	-0.4%	38,794	39,760	40,509	1.9%	3.0%	2.9%	2.8%
Owner Median Value	N-A	\$406,961	\$450,854	10.8%	N-A	\$322,496	\$375,747	16.5%	N-A	126.2%	120.0%
Owner Average Value	N-A	\$463,190	\$502,613	8.5%	N-A	\$381,894	\$436,549	14.3%	N-A	121.3%	115.1%
Median Household \$	N-A	\$98,748	\$109,741	11.1%	N-A	\$76,604	\$85,662	11.8%	N-A	128.9%	128.1%
Per Capita \$	N-A	\$56,250	\$62,608	11.3%	N-A	\$43,854	\$49,337	12.5%	N-A	128.3%	126.9%
	Firms	Employees	Emp/Firm	% of Firms	Firms	Employee s	Emp/Firm	% of Firms	Firms	Emp	Emp/Fir m
Totals (2021)	543	5,268	9.7	100.0%	14,042	197,591	14.1	100.0%	3.9%	2.7%	68.9%
Retail sector	107	1,230	11.5	19.7%	3,004	40,345	13.4	21.4%	3.6%	3.0%	85.6%
Office sector	45	304	6.8	8.3%	1,340	16,922	12.6	9.5%	3.4%	1.8%	53.5%
Service sector	239	2,274	9.5	44.0%	5,916	91,545	15.5	42.1%	4.0%	2.5%	61.5%
Manufacturing sector	19	432	22.7	3.5%	420	9,703	23.1	3.0%	4.5%	4.5%	98.4%
Other	133	1,028	7.7	24.5%	3,362	39,076	11.6	23.9%	4.0%	2.6%	66.5%

Source: Esri and RKG (2022)

(1) 3-mile radius about the potential station location

N-A - data suppressed or otherwise unreported

Residential Development Potential

Estimated residential development potential for the potential Yarmouth Junction station area is indicated in Table 17. **The potential for owner housing, as calculated in this analysis, could exceed the capacity of available land to support such development and may better reflect more densely developed owner condominiums targeted to specific age cohorts. Any increased density would be planned in coordination with Yarmouth. However, this analysis assesses the potential in the study area.**

Table 17 Potential Yarmouth Junction Station Area - Estimated Residential Development Potential

Potential Yarmouth Junction Station Study Area 2021 - 2026 Residential	Baseline # of Units	Low Estimate ¹	High Estimate ²
Total Housing Units	172	260	312
Owner households	177	237	277
Renter households	(5)	23	35

Source: Esri and RKG (2022)

(1) Increase 2026 representation of county by 1.15% for owner and 1.25% for renter

(2) Increase 2026 representation of county by 1.25% for owner and 1.35% for renter

Retail Demand and Sales Comparisons

Retail demand and sales comparative metrics for the Yarmouth Junction station site (3-mile radius) and the county are detailed in Table 18, noting:

- ▶ Significant sales leakage is projected across all industry sectors in the study area, with total sales accounting for 65.0% of the study area demand. **As a result, there may be opportunities for additional retail development in the study, cautioning that for all sectors, the county is a net importer of such sales, at 142.0% of demand in these sectors.**

Overall annual per household spending demand among these sectors is approximately \$7,050 in the study area as compared with \$13,928, about 51.0% of the county overall.

Table 18 Potential Yarmouth Junction Station Area- Selected Retail Demand and Sales Comparisons

Selected Retail Sector Comparative Metrics (in \$1,000's)	Potential Yarmouth Junction Station Area ¹			Cumberland County			Yarmouth Junction as % of Co.	
	Demand	Sales	Import (Export)	Demand	Sales	Import (Export)	Demand	Sales
Total	\$34,995.0	\$22,627.0	(\$12,368.0)	\$639,411.5	\$909,172.0	\$269,760.5	5.5%	2.5%
Specialty food stores ²	\$2,885.7	\$858.7	(\$2,027.0)	\$53,895.6	\$177,360.0	\$123,464.4	5.4%	0.5%
Secondhand stores ³	\$1,905.8	\$1,715.5	(\$190.3)	\$34,159.5	\$47,160.9	\$13,001.4	5.6%	3.6%
Other specialty retail ⁴	\$5,116.4	\$3,738.4	(\$1,378.0)	\$97,505.1	\$146,558.0	\$49,052.9	5.2%	2.6%
Restaurants ⁵	\$25,087.0	\$16,314.4	(\$8,772.7)	\$453,851.3	\$538,093.1	\$84,241.8	5.5%	3.0%

Source: Esri and RKG (2022)

- (1) 3-mile radius about the potential station location - Note that overlaps exist with Royal Junction station location - reported in full with the overlap
- (2) includes meat and fish markets, produce, bakeries and confectioneries and nuts as example
- (3) includes used merchandise, consignment shops and charitable thrift stores as examples
- (4) includes pet supply stores, tobacco shops and generally unspecified other as examples
- (5) includes full-service, limited-service, cafeterias, and snack vendors as examples

THIS PAGE INTENTIONALLY LEFT BLANK

2

METHODOLOGY & ALIGNMENT COMPARISON

This chapter will elaborate on the methodology for economic modeling process, and preliminary findings on each of the two Alignments with attention to infrastructure (Capital) costs and ongoing annual operating & maintenance (O&M) costs.

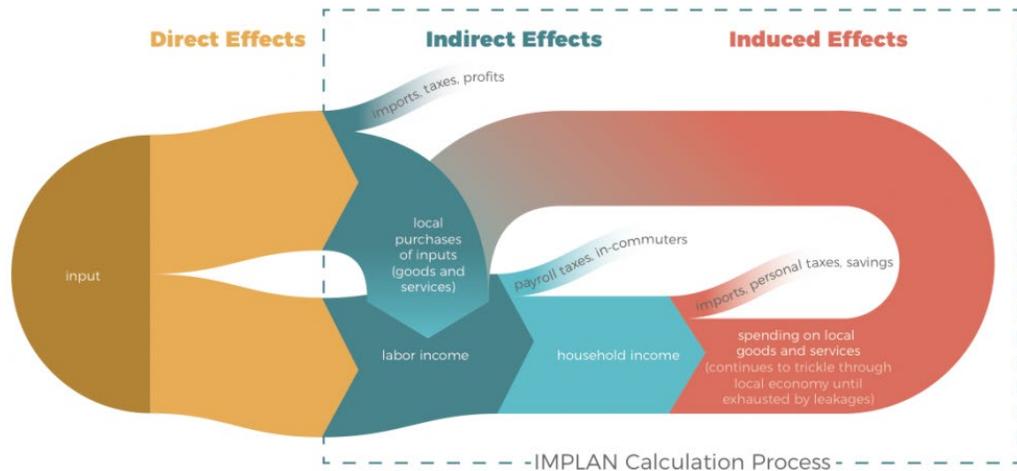
IMPLAN Modeling Methodology

A process called Impact Analysis for Planning (IMPLAN) Modeling was utilized to estimate the broader impacts of the potential rail stations with the two corridor alignment alternatives considered in this report, throughout the State of Maine's economy, for the potential development of rail services (excluding costs associated with the actual construction) and operating and maintenance (O&M) costs.

This dollar flow modeling was conducted between different sectors of the economy, showing how a dollar in one sector is spent and impacts others through direct investment in economic activity, business-to-business spending, and household expenditures. It estimated a range of potential value added to the Statewide economy, including employment, labor income, and the dollar value added to statewide Maine economy.

IMPLAN Modeling is a widely accepted and utilized econometric modeling software that uses an input-output dollar flow matrix, illustrated in Figure 9. For a specified region, the input-output table accounts for all dollar flows between different sectors of the economy. This information is used to model the way a dollar injected into one sector of the economy, such as construction, is spent and re-spent in other sectors of the economy, generating waves of economic activity, or “economic multiplier” effects. These effects are categorized as direct, indirect, and induced effects which encompass direct investment in economic activity, business-to-business spending, and household expenditures.

Figure 9 Flow Chart of IMPLAN Modeling Concepts



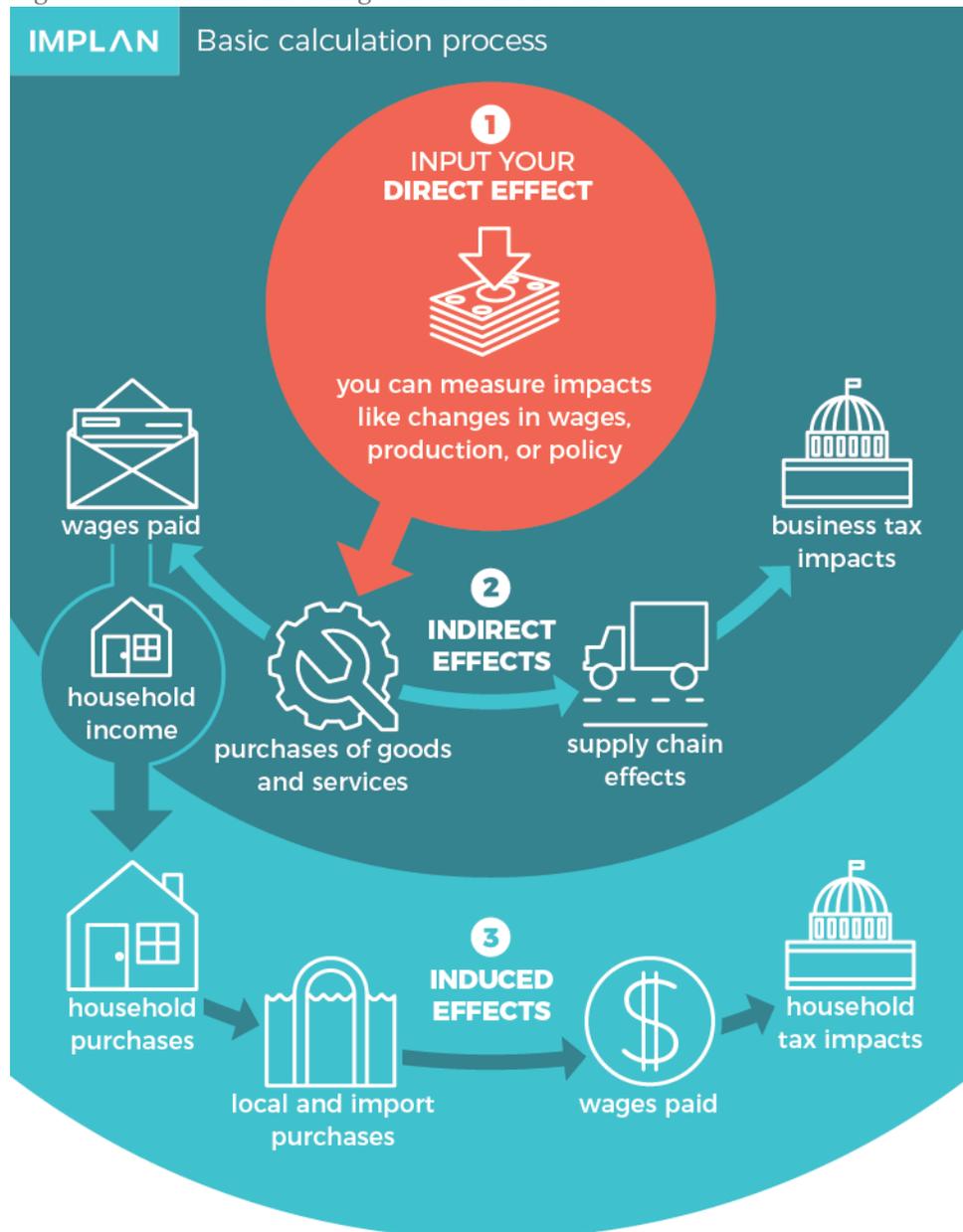
The model combines this data to generate a series of multipliers for the local economy. The multiplier measures the amount of total economic activity that results from an industry (or household) spending an additional dollar in the local economy. Based on these multipliers, IMPLAN generates a series of tables to show the economic event’s direct, indirect, and induced impacts to gross receipts or outputs (see Figure 10).

IMPLAN modeling reflects how a dollar spent recirculates or ripples throughout the economy by considering the following:

- ▶ **Direct Impacts** refers to the dollar value of economic activity available to circulate through the economy. In the case of this analysis, the direct impacts are equal to the estimated construction costs for the project, employment compensation associated with employees working at the project site, labor income from new job opportunities following construction and the household spending associated with new households, if applicable.
- ▶ **Indirect Impacts** refers to the “inter-industry impacts of the input-output analysis.” Indirect impacts result from spending by employees working at the project site as well as business spending on goods and services to retail establishments, restaurants, personal service providers, and other firms. These businesses then use the payments they receive to buy equipment and supplies, rent space, pay their employees, etc. These expenditures also have an impact on the economy.

- ▶ **Induced Impacts** refers to the impacts of household spending by the employees generated by the direct and indirect impacts. In other words, induced impacts result from the household spending of employees of business establishments that the new employees patronize (direct) and their suppliers (indirect). The model excludes payments to federal and state taxes and savings based on the geography’s average local tax and savings rates. Thus, only the disposable incomes from local workers are included in the model.

Figure 10 IMPLAN Modeling Calculation Process



The following sections present the summary findings from the various IMPLAN model “runs” completed for this analysis²⁰. For each of the separate rail alignment alternatives (1A and 1B), the analyses include:

- ▶ Infrastructure Costs: one-time impacts as derived from the investment costs in infrastructure, also referred to as capital construction costs.
- ▶ Operating & Maintenance (O&M) Costs: the annual and ongoing costs associated with operating and maintenance.

It is important to note the following assumptions:

- ▶ Infrastructure, or capital construction impacts, will likely be realized over the construction period (of unknown length at this time) but are presented in this analysis as if a lump-sum single metric.
- ▶ O&M costs are estimated to be annual and would represent recurring impacts.
- ▶ All impacts are reflections of statewide impacts and are specifically not particular to any potential station area.

In general, the metric of particular interest through the analyses is the **value-added metric** which measures the total of the economic impacts for direct, indirect, and induced impacts. The value-added component reflects the difference between output (the initial dollar investment) and the costs associated with the intermediate inputs. These latter costs include the purchases of non-durable goods and services such as energy and purchased services that may be used for the production of other goods and services – as opposed to those that are purchased for final consumption. As a result, the value-added metric, the statewide ripple, is the sum of the following:

- ▶ **Employee Compensation** - includes wages and salaries, all benefits (e.g., health, retirement) and payroll taxes (both sides of social security, unemployment insurance taxes, etc.), and is often referred to as fully loaded payroll.
- ▶ **Proprietor Income** - consists of payments received by self-employed individuals and unincorporated business owners.
- ▶ **Taxes on Production and Imports (TOPI)** – includes sales/excise taxes, customs duties, property taxes, motor vehicle licenses, severance taxes, other taxes, and special assessments.
- ▶ **Other Proprietary Income (OPI)** – represents income generated by industries throughout economies from non-operating activities. Basically, OPI represents gross operating surplus minus proprietor income.

²⁰ All costs were based on the 2019 report and in 2019 dollars, however, the IMPLAN results are in 2022 dollars.

2.1 Alignment 1A Potential Stations

The Alignment 1A analysis reflects the western route for the proposed rail services with the following potential station areas - Lewiston, Auburn (Park and Ride), and Pineland West.²¹ IMPLAN modeling results as related to the infrastructure costs are detailed in Table 19, and Table 20 displays the ongoing O&M costs.

Alignment 1A Infrastructure Investment – Capital Costs

- ▶ **Low Costs** – In total (direct, indirect, and induced), with low capital costs, the estimated value added to the Maine economy with Alignment 1A is \$161.94 million.
 - The infrastructure investment of \$189.00 million (direct output) results in the estimated employment of 1,359 positions (direct) with labor income of \$71.97 million (direct). The estimated dollar value added to the statewide Maine economy from these direct inputs is \$67.03 million. The direct impacts also result in both indirect and induced impacts, totaling \$172.02 million (output) and then translate to 1,032 in employment with labor income of \$57.03 million. The indirect and induced value added to the statewide economy is \$94.91 million.
- ▶ **High Costs** – In total (direct, indirect, and induced), with high capital costs, the estimated value added to the Maine economy with Alignment 1A is \$197.07 million.
 - The infrastructure investment of \$230.00 million (direct output) results in the estimated employment of 1,654 positions (direct) with labor income of \$87.58 million (direct). The estimated dollar value added to the statewide Maine economy from these direct inputs is \$81.57 million. The direct impacts also result in both indirect and induced impacts, totaling \$209.34 million (output) and then translate to 1,262 in employment with labor income of \$69.40 million. The indirect and induced value added to the statewide economy is \$115.50 million.

Table 19 IMPLAN Model Results Alignment 1A – Infrastructure Costs

ALIGNMENT 1A (PAR) – Low Costs – High Costs

Input Costs	Construction Costs for Infrastructure = \$189.00 to \$230.00 (millions)			
Impact	Employment	Labor Income	Value Added	Output
1 - Direct	1,359 - 1,654	\$71.97 - \$87.58	\$67.03 - \$81.57	\$189.00 - \$230.00
2 - Indirect	484 - 589	\$28.70 - \$34.93	\$45.10 - \$54.89	\$87.26 - \$106.19
3 - Induced	554 - 674	\$28.33 - \$34.47	\$49.81 - \$60.61	\$84.77 - \$103.15
Total	2,522 - 3,075	\$129.00 - \$156.99	\$161.94 - \$197.07	\$361.02 - \$439.34

Source: IMPLAN, VHB and RKG (2022)

Note - input costs in 2019 dollars, output impacts in 2022 dollars - all in \$millions

²¹ The context of this analysis is ongoing and as of the IMPLAN modeling, the potential Royal Junction Station area is no longer included.

Alignment 1A Operating and Maintenance (O&M) Costs

- ▶ **Low Costs** – In total (direct, indirect, and induced), with low O&M costs, the estimated value added to the Maine economy with Alignment 1A is \$13.90 million.
 - The ongoing and annual O&M costs of \$15.00 million (direct output) results in the estimated employment of 41 positions (direct) with labor income of \$5.26 million (direct). The estimated dollar value added to the statewide Maine economy from these direct inputs is \$5.97 million. The direct impacts also result in both indirect and induced impacts, totaling \$13.89 million (output) and then translate to 85 in employment with labor income of \$4.66 million. The indirect and induced value added to the statewide economy is \$7.93 million.
- ▶ **High Costs** – In total (direct, indirect, and induced), with high O&M costs, the estimated value added to the Maine economy with Alignment 1A is \$17.61 million.
 - The ongoing and annual O&M costs of \$19.00 million (direct output) results in the estimated employment of 52 positions (direct) with labor income of \$6.66 million (direct). The estimated dollar value added to the statewide Maine economy from these direct inputs is \$7.56 million. The direct impacts also result in both indirect and induced impacts, totaling \$17.58 million (output) and then translate to 107 in employment with labor income of \$5.90 million. The indirect and induced value added to the statewide economy is \$10.05 million.

Table 20 IMPLAN Model Results Alignment 1A – Ongoing Annual O&M Costs

ALIGNMENT 1A (PAR) - Low Costs – High Costs

Input Costs	Annual Ongoing O&M Costs = \$15.00 to \$19.00 million			
Impact	Employment	Labor Income	Value Added	Output
1 - Direct	41 – 52	\$5.26 - \$6.66	\$5.97 - \$7.56	\$15.00 - \$19.00
2 - Indirect	43 – 55	\$2.53 - \$3.20	\$4.18 - \$5.30	\$7.49 - \$7.49
3 - Induced	42 – 53	\$2.13 - \$2.70	\$3.75 - \$4.75	\$6.38 - \$8.09
Total	125 - 159	\$9.92 - \$12.57	\$13.90 - \$17.61	\$28.88 - \$35.58

Source: IMPLAN, VHB and RKG (2022)

Note - input costs in 2019 dollars, output impacts in 2022 dollars - all in \$millions

2.2 Alignment 1B Potential Stations

The Alignment 1B analysis reflects the eastern route for the proposed rail services with the following potential station areas - Lewiston, Auburn (Park and Ride), Pineland East and Yarmouth Junction. IMPLAN modeling results as related to the infrastructure costs are detailed in Table 21, and Table 22 displays the ongoing O&M costs.

Alignment 1B Infrastructure Investment – Capital Costs

- ▶ **Low Costs** – In total (direct, indirect, and induced), with low capital costs, the estimated value added to the Maine economy with Alignment 1B is \$177.36 million.
 - The infrastructure investment of \$207.00 million (direct output) results in the estimated employment of 1,488 positions (direct) with labor income of \$78.827 million (direct). The estimated dollar value added to the Maine economy (statewide) from these direct inputs is \$73.41 million. The direct impacts also result in both indirect and induced impacts, totaling \$188.40 million (output) and then translate to 1,136 in employment with labor income of \$67.46 million. The indirect and induced value added to the statewide economy is \$103.95 million.
- ▶ **High Costs** – In total (direct, indirect, and induced), with high capital costs, the estimated value added to the Maine economy with Alignment 1B is \$21.63 million.
 - The infrastructure investment of \$254.00 million (direct output) results in the estimated employment of 1,862 positions (direct) with labor income of \$96.72 million (direct). The estimated dollar value added to the Maine economy (statewide) from these direct inputs is \$90.08 million. The direct impacts also result in both indirect and induced impacts, totaling \$231.19 million (output) and then translate to 1,394 in employment with labor income of \$76.65 million. The indirect and induced value added to the statewide economy is \$127.55 million.

Table 21 IMPLAN Model Results Alignment 1B – Infrastructure Costs

ALIGNMENT 1B (SLR) - Low Costs – High Costs

Input Costs	Construction Costs for Infrastructure = \$207.0 to \$254.0 million			
Impact	Employment	Labor Income	Value Added	Output
1 - Direct	1,488 – 1,825	\$78.82 – \$96.72	\$73.41 – \$90.08	\$207.00 – \$254.00
2 - Indirect	530 – 650	\$31.44 – \$38.58	\$49.40 – \$60.61	\$95.57 – \$117.27
3 - Induced	606 – 744	\$31.03 – \$38.07	\$54.55 – \$66.94	\$92.84 – \$113.92
Total	2,624 – 3,220	\$141.29 – \$173.37	\$177.36 – \$217.63	\$395.41 – \$485.19

Source: IMPLAN, VHB and RKG (2022)

Note - input costs in 2019 dollars, output impacts in 2022 dollars - all in \$millions

Alignment 1B Operating and Maintenance (O&M) Costs

- ▶ **Low Costs** – In total (direct, indirect, and induced), with low O&M costs, the estimated value added to the Maine economy with Alignment 1B is \$14.83 million.
 - The ongoing and annual O&M costs of \$16.00 million (direct output) results in the estimated employment of 43 positions (direct) with labor income of \$5.61 million (direct). The estimated dollar value added to the Maine economy (statewide) from these direct inputs is \$6.36 million. The direct impacts also result in both indirect and induced impacts, totaling \$14.80 million (output) and then translate to 90 in employment with labor income of \$4.97 million. The indirect and induced value added to the statewide economy is \$8.46 million.
- ▶ **High Costs** – In total (direct, indirect, and induced), with high O&M costs, the estimated value added to the Maine economy with Alignment 1B is \$18.53 million.
 - The ongoing and annual O&M costs of \$20.00 million (direct output) results in the estimated employment of 54 positions (direct) with labor income of \$7.01 million (direct). The estimated dollar value added to the Maine economy (statewide) from these direct inputs is \$7.95 million. The direct impacts also result in both indirect and induced impacts, totaling \$18.50 million (output) and then translate to 113 in employment with labor income of \$6.21 million. The indirect and induced value added to the statewide economy is \$10.58 million.

Table 22 IMPLAN Model Results Alignment 1B – Ongoing Annual O&M Costs

ALIGNMENT 1B (SLR) - Low Costs – High Costs

Input Costs	Annual Ongoing O&M Costs = \$16.0 to \$20.0 million			
Impact	Employment	Labor Income	Value Added	Output
1 - Direct	43 - 54	\$5.61 - \$7.01	\$6.36 - \$7.95	\$16.00 - \$20.00
2 - Indirect	46 - 57	\$2.70 - \$3.37	\$4.46 - \$5.58	\$7.99 - \$9.99
3 - Induced	44 - 56	\$2.27 - \$2.84	\$4.00 - \$5.00	\$6.81 - \$8.51
Total	134 - 167	\$10.58 - \$13.23	\$14.83 - \$18.53	\$30.80 - \$38.50

Source: IMPLAN, VHB and RKG (2022)

Note - input costs in 2019 dollars, output impacts in 2022 dollars - all in \$millions

2.3 Comparisons of Alignment Alternatives

A comparison of the total economic impacts associated with each proposed Alignment are detailed in the following tables, for both the infrastructure investment (capital costs) and the ongoing operations and maintenance (O&M) expenditures. These are offered in total here, meaning the sum of direct, induced, and indirect impacts.

Comparison of Infrastructure Investment – Capital Costs

Table 23 compares the outputs for the infrastructure (capital) costs of Alignment 1A and Alignment 1B, noting the following:

- ▶ **Low Costs** - in terms of the initial investment (**direct output only**) the cost for Alignment 1B is estimated at \$207.00 million as contrasted to \$189.00 million for Alignment 1A for a variance, or percent difference, of approximately 9.52%.
 - While this variance is the same for all of the dollar estimates, a function of the modeling, the difference occurs in the total estimated employment with Alignment 1B exceeding Alignment 1A by 103 positions or by approximately 4.08%.
- ▶ **High Costs** - in terms of the initial investment (**direct output only**) the cost for Alignment 1B is estimated at \$254.00 million as contrasted to \$230.00 million for Alignment 1A for a variance of approximately 10.43%.
 - While this variance is the same for all of the dollar estimates, the difference occurs in the total estimated employment with Alignment 1B exceeding Alignment 1A by 145 positions or by approximately 4.73%.

Table 23 Infrastructure Costs Comparison

Infrastructure Costs Comparison

	Low Costs – High Costs				
	Employment (Total)	Labor Income	Value Added	Output	Initial Investment ¹
		(Rounded \$ Millions)			
Alignment 1A	2,522 - 3,075	\$129.00 - \$156.99	\$161.94 - \$197.07	\$361.02 - \$439.34	\$189.00 - \$230.00
Alignment 1B	2,624 - 3,220	\$141.29 - \$173.37	\$177.36 - \$217.63	\$395.41 - \$485.19	\$207.00 - \$254.00
Difference	103 - 145	\$12.29 - \$16.38	\$15.42 - \$20.56	\$34.38 - \$45.84	\$18.00 - \$24.00

Source: IMPLAN, VHB and RKG (2022)

(1) – Initial Investment = Capital Costs

Comparison of Operating & Maintenance (O&M) Costs

The data in Table 24 shows that the dollar variance between both the low costs estimates and the high costs estimate is \$1.0 million, with respect to the comparison of the outputs for the annual and ongoing O&M costs of Alignment 1A and Alignment 1B, indicating:

- ▶ **Low Costs** – the variances for all IMPLAN model outputs are that Alignment 1B exceeds Alignment 1A by 6.67% similar to the percent difference between \$15.0 million (Alignment 1A) and \$16.0 million (Alignment 1B).
- ▶ **High Costs** – the variances for all IMPLAN model outputs are that Alignment 1B exceeds Alignment 1A by 5.26% similar to the percent difference between \$19.0 million (Alignment 1A) and \$20.0 million (Alignment 1B).

Table 24 Annual O&M Costs Comparison

Annual O&M Costs Comparison

	Low Costs – High Costs				
	Employment (Total)	Labor Income	Value Added	Output	Annual O&M Costs
	(Rounded \$ Millions)				
Alignment 1A	125 - 159	\$9.92 - \$12.57	\$13.90 - \$17.61	\$28.88 - \$36.58	\$15.00 - \$19.00
Alignment 1B	134 - 167	\$10.58 - \$13.23	\$14.83 - \$18.53	\$30.80 - \$38.50	\$16.00 - \$20.00
Difference	8	\$0.66	\$0.93	\$1.93	\$1.00

Source: IMPLAN, VHB and RKG (2022)

3

KEY FINDINGS

This chapter will detail key findings surrounding each potential station area for:

- ▶ Population
- ▶ Households
- ▶ Residential Development Potential
- ▶ Projected Population Change as a Result of Household Change
- ▶ Owner Home Values
- ▶ Income Comparisons
- ▶ Selected Employment Comparisons
- ▶ Comparisons of Potential Service and Office Sector Development
- ▶ Estimates of Selected Retail Spending Demand from Households and Employees

This chapter will also highlight fiscal and economic benefits in terms of ridership and revenues, and other transit benefits and considerations such as safety benefits, travel time savings, energy and emission reductions, and affordable mobility.

3.1 Key Findings

This section discusses the key findings from this analysis. All baseline inputs, assumptions and analysis used to derive these key findings are discussed throughout the remainder of this report. These findings reflect a comparison of socio-economic and retail/commercial metrics as they may translate to residential and non-residential development opportunities for each potential station area.

Based on the analysis there is an estimated minimal distinction between the two Alignments.

The economic analysis finds that Alignment 1B requires a higher initial investment or capital costs; however, this is because it consists of four potential station sites, while Alignment 1A consists of three potential station sites.

Similarly, Alignment 1B sees greater value-added metrics (statewide economic ripple effects) than Alignment 1A, but this is directly related to the higher initial investment costs for Alignment 1B and does not inherently favor one alignment over the other.

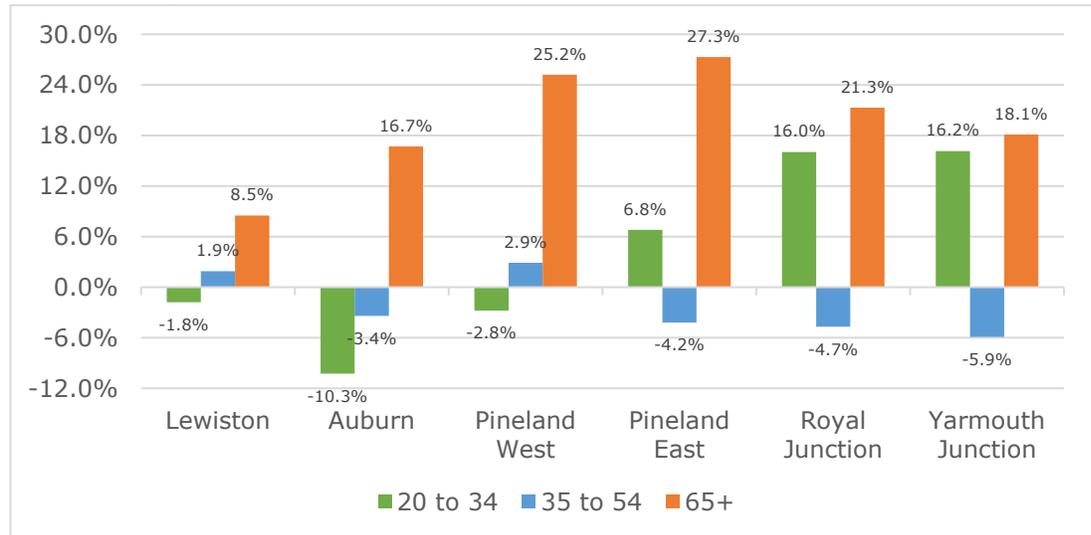
As detailed earlier, the potential Royal Junction station was removed from consideration in this study, however, its analysis is included throughout this chapter for reference.

3.1.1 Population Change by Age Cohort

Comparisons of the projected total population change and population change by age for each potential station area over the 2021 – 2026 period are indicated in Figure 11:

- ▶ The cohort aged 20 to 34 sees reasonably strong projected population growth for the Pineland East, Royal Junction, and Yarmouth Junction station areas. In fact, for all three of these station areas, the projected growth in this population cohort exceeds that for the county. **This suggests potential opportunities for development of rental housing in these locations at price points and amenities attractive to these often-first-time renters.**
- ▶ With exceptions of the Lewiston station and the Pineland West station, the population in the 35 to 54 age cohort is projected to decline. This cohort typically represents those in their family formation and home buying years, as well as those in peak earning and spending years. **Declines in this population could signify diminished first-time home ownership and reduced retail spending demand within the study area.**
- ▶ The population cohort aged 65+ is projected to increase within each station area and **suggests opportunities for increased residential demand, either renter demand or owner demand** (possibly owner condominiums) both of which would also facilitate **greater development densities for housing options targeted to this demographic.** Such options generally include housing types with smaller footprints and perhaps assisted living or other older adult care facilities.

Figure 11 Population Change by Potential Station Area and Selected Age Cohorts, 2021 – 2026



Source: Esri and RKG (2022)

Alignment Comparisons

When comparing the potential station groupings for Alignment 1A and 1B, the differences between the Pineland West and East station populations under 65 are somewhat marginal, where Alignment 1A (PAR) sees a projected growth in the 35 to 54 age cohort at the Pineland West station area, who are frequently homeowners. Conversely in Alignment 1B (SLR), the potential Pineland East station area projects a decline in this cohort, with a larger growth in the 20 to 34 age cohort, often first-time renters. Since the potential Royal Junction station was removed from consideration, the greatest difference between alignments is due to population increase in the 20 to 34 and 65 and older age cohorts associated with the potential Yarmouth Junction station, Alignment 1B (SLR).

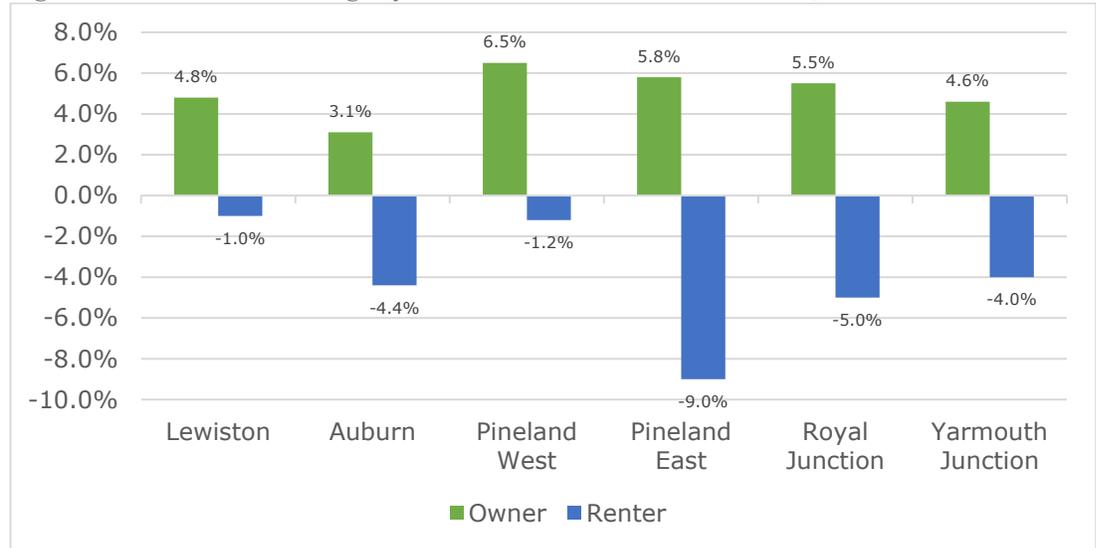
3.1.2 Household Change by Tenure – Owner and Renter

Comparisons of the projected household change for each potential station area by tenure (owner and renter) over the 2021 – 2026 period are indicated in Figure 12:

- ▶ Although all potential station areas are projected realize some growth in owner-occupied housing units over the 2021 – 2026 period, this may not necessarily be indicative of newly built housing. Some of this new demand could reflect a portion of current renters becoming homeowners by purchasing existing ownership units. While some of the projected change in owner housing could be captured in newly built units, it may be minimal, as affordability issues for both buyers and builders could impact such development. This is also compounded by the projected loss of residents ages 35 to 54 years, as previously noted.
- ▶ Despite projected declines in renter housing for each potential station area, the previously noted growth in the population aged 65+ may offer opportunities for additional housing with increased development densities. This would require the availability of land (or land assemblages) to enable larger-scale development in these

station areas. Further, to the extent that existing study area owner households over 65 years in age transition to renter housing, then the existing owner housing inventory and availability could be enhanced.

Figure 12 Household Change by Potential Station Area and Tenure, 2021 – 2026



Source: Esri and RKG (2022)

Alignment Comparisons

When comparing the station groupings for Alignment 1A and 1B, the greatest difference between alignments is due to household change associated with the potential Yarmouth Junction station, Alignment 1B (SLR), since the potential Royal Junction station was removed from consideration. Other differences between the station groupings are noted between the potential Pineland West and East stations, which may affect development potential. While all potential station areas see projected growth in owner households, Pineland East (Alignment 1B) projections show a significant 9% decrease in renter households, compared to Pineland West at just 1.2% decrease (Alignment 1A).

3.1.3 Residential Development Potential 2021 - 2026

Ownership housing demand estimates (2021 – 2026) are illustrated in Figure 13 for each potential station area. For this analysis, three different growth scenarios were utilized. First, the baseline potential reflects current population and household projections as a share of the county’s overall growth. The second and third scenarios (1.15% and 1.25% increases) represent a projected increase for each station area’s capture of county

growth, on the assumption that the addition of new housing and public transportation options may make these areas more desirable to build and live in²².

The base assumption is that given “new” housing choices, proximity to commuter rail and any potential for additional non-residential development and amenities could work together to enhance the location desirability of the study area. Further, that any new residential development in the study area would be positioned to effectively target countywide population change, especially in targeted population age cohorts²³.

Rental housing demand estimates (2021 – 2026) are illustrated in Figure 14 for each station area. Like the ownership demand projections, the baseline potential reflects current population and household projections as a share of the county’s overall growth, while the additional metrics represent a projected increase for each station area’s capture of county growth on the assumption that the addition of new housing and public transportation options may make these areas more desirable to build and live in²⁴.

Despite negligible rental demand for several station areas, there may be opportunities to change these demand factors by targeting rental housing to older adults who may be looking for opportunities to downsize or move to a different type of housing than single-family or other forms of owner-occupied housing. Like owner-occupied housing development, additional rental opportunities would require available land, or land assemblages, investor/developer interest, as well existing zoning regulations.

Alignment Comparisons

When comparing the station groupings for Alignment 1A and 1B, the greatest difference between alignments is due to estimated development potential for both owner and renter units associated with the potential Yarmouth Junction station, Alignment 1B (SLR), since the potential Royal Junction station was removed from consideration.

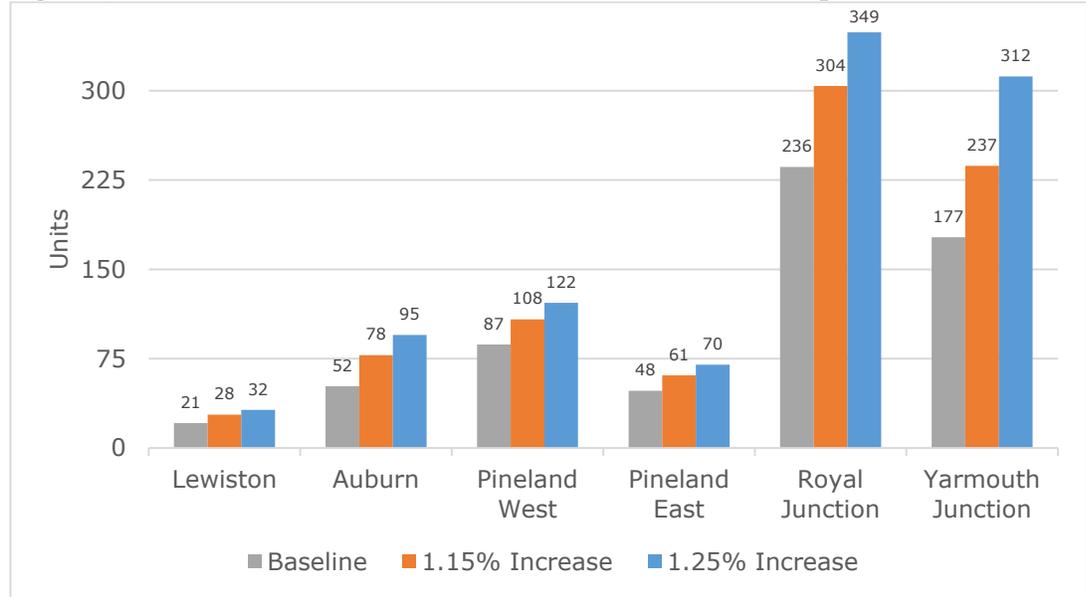
Other significant differences between the station groupings are noted between the Pineland West and East stations, indicating that Alignment 1A (PAR) has greater estimated potential for owner residential development than Alignment 1B (SLR).

²² For example, the baseline projected increase in owner housing units for the Lewiston Station area is 21 but could increase to 28 using a 1.15% increase in countywide market share or 32 units using a 1.25% increase in countywide market share.

²³ Ultimately, additional residential development opportunities would be a factor (in part) of available land, or land assemblages, for such development, investor/developer interest and determinations of market and financial feasibility, as well existing zoning regulations.

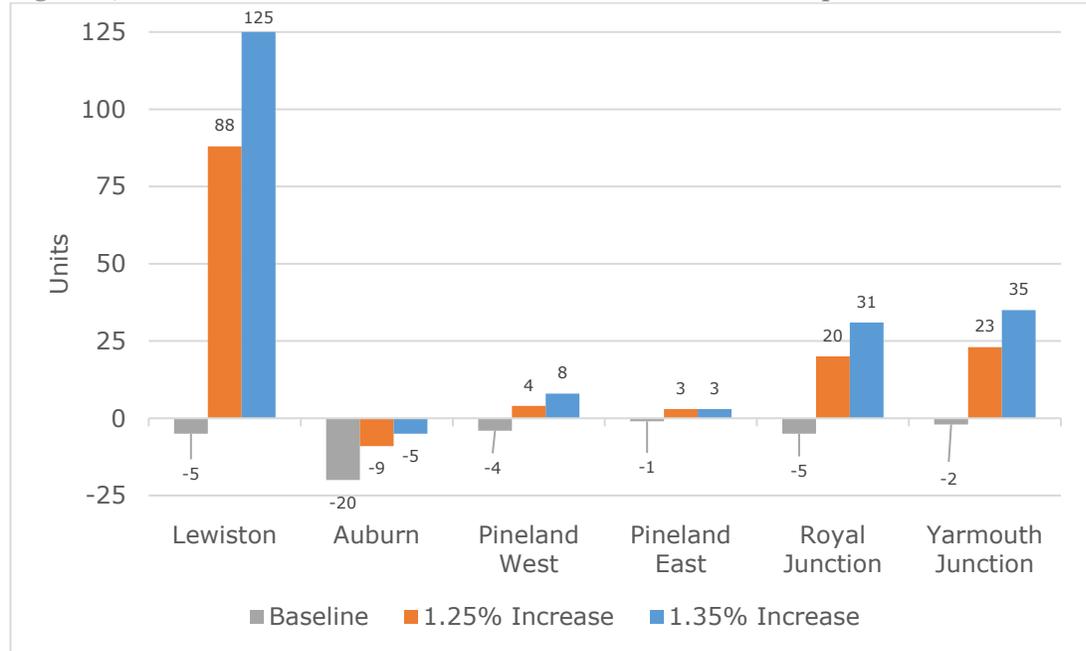
²⁴ Note that the projected opportunity for additional rental units around the Lewiston Station site does not include the proposed pipeline development of 512 new units. Rather, the projections reflect an increased “capture or market share” of countywide renter housing. The pipeline units are discussed and utilized later in this report.

Figure 13 Owner Residential Units - Estimated Potential for Development



Source: Esri and RKG (2022)

Figure 14 Renter Residential Units - Estimated Potential for Development



Source: Esri and RKG (2022)

3.1.4 Projected Population Change as a Result of Household Change

The preceding estimates of household change for both owner and renter units in each station area would also represent a change in total population within each station area.

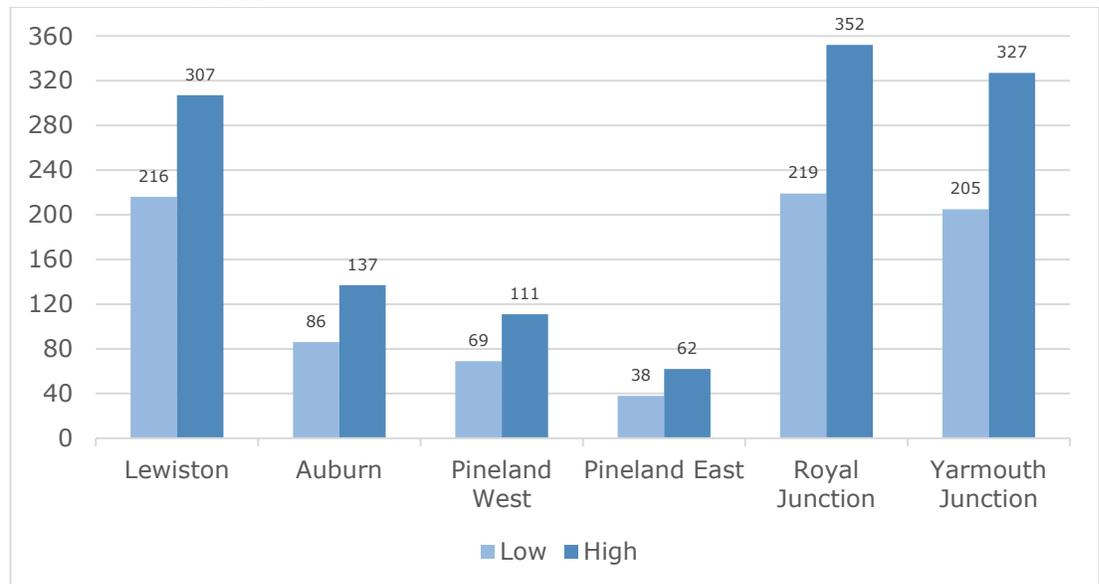
This analysis used the countywide average household size for owner and renter households as reported by the US Census.²⁵

The population projections from new housing may reflect a redistribution of county households that would have otherwise occurred elsewhere in the county had it not been for the introduction of transit and new housing units. Although some percentage of the growth may come from net new households to the county. The estimates shown in Figure 15 are for population change over the 2021-2026 five-year period²⁶.

Alignment Comparisons

Similar to comparisons in earlier sections, Alignment 1B (SLR) sees greater projected population change as a result of household change than Alignment 1A (PAR), with potentially greater development opportunities associated with this. Although Pineland West (1A) station estimates double the population change as Pineland East (1B), the population increase associated with the potential Yarmouth Junction station (1B) is the most significant, as the potential Royal Junction station was removed from consideration.

Figure 15 Projected Population Change as a Result of Household Change by Potential Station Area



Source: Esri, US Census and RKG (2022)

²⁵ Androscoggin Co. owner (2.42/HH) renter (2.15/HH) - Cumberland Co. owner (2.49/HH) renter (1.97/HH).

²⁶ It should be noted that the projected population change around the Lewiston Station site does not include the proposed pipeline development of 512 new units. Excluding the 140 units for student housing and the replacement housing 37 units, new pipeline housing in the Lewiston Station area is 372 units. Assuming the countywide average of 2.15 persons/renter household, these units could add 800 residents to the Lewiston Study area. Note that this does not necessarily equate to a net new population of 800 residents but would as likely reflect some redistribution of the overall countywide population.

3.1.5 Owner Home Values

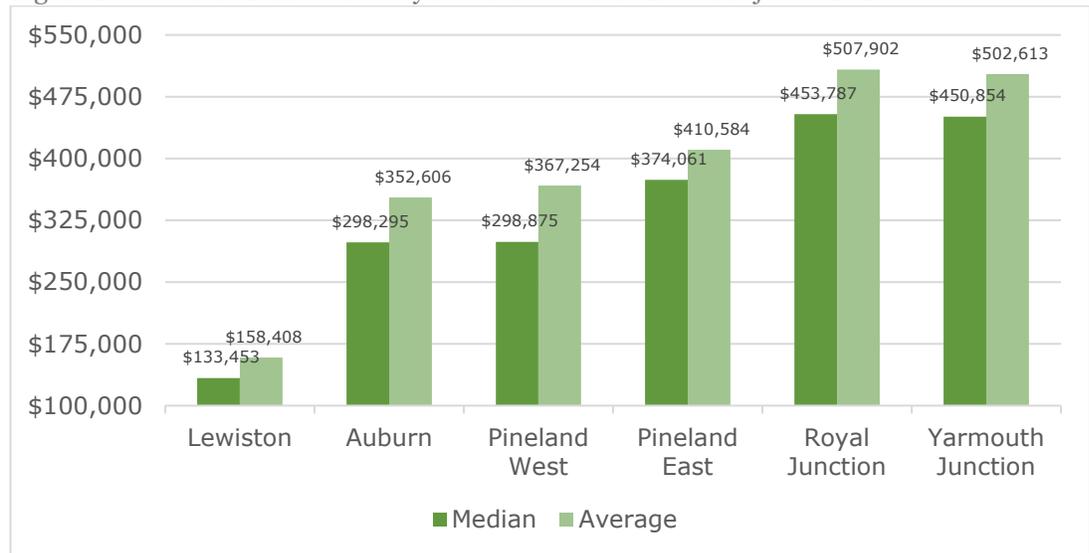
Owner home value projections for each potential station area in 2026, both median and average, are indicated in Figure 16, noting:

- ▶ The potential Lewiston station area’s comparatively lower home values (both median and average) may suppress developer interest in new construction as influenced by the capacity to have selling prices recover construction costs. An exception may be some limited development of higher valued owner housing where location to commuter rail access is among the decision factors for the homebuyer.
- ▶ For all other station areas, the median and average home values are comparatively high and may be at breakpoints attractive to some home buyers and developers. As noted previously, the increase in the population cohort aged 65+ could translate to additional housing desirability, assumed to be predominantly rental in this analysis, but potentially owner condominiums too. Again, available land to facilitate developer interest and development density are keys factors.

Alignment Comparisons

When comparing the potential station groupings for Alignment 1A and 1B, the greatest difference between alignments is due to projected owner home values associated with the potential Yarmouth Junction station, Alignment 1B (SLR), since the potential Royal Junction station was removed from consideration. Other differences are noted between the Pineland West and East stations, where Alignment 1B (SLR) also sees greater projected median and average owner home values.

Figure 16 Owner Home Values by Potential Station Area - Projected 2026



Source: Esri and RKG (2022)

3.1.6 Income Comparisons

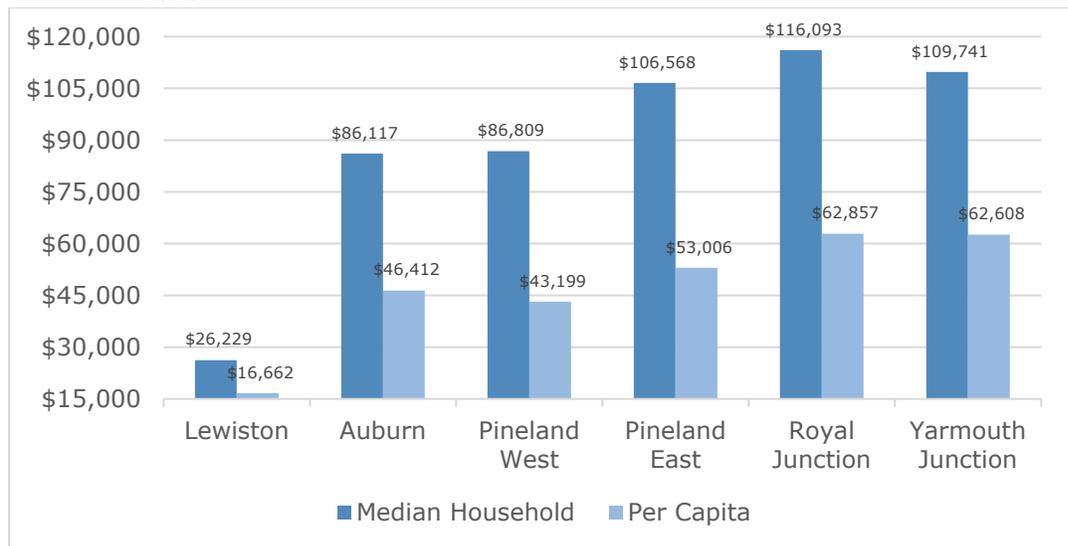
Projected median household income and per capita income for each potential station area are shown in Figure 17, noting:

- ▶ Both income measures serve to reflect some level of either household or per capita wealth and disposable income and spending potential. Both are comparatively lower in the Lewiston station area and suggest a lower household and per capita spending capacity to support additional retail development opportunities. This outlook could change if new retail in this station area drew customers from a broader geographic area.
- ▶ The combined and average median household income in 2026 for the Pineland West station to Royal Junction station is approximately \$101,450. The similar measure for the Pineland East station to Yarmouth Junction station is approximately \$108,155 or 7% higher. This may indicate that disposable income and spending potential for the Pineland East/Yarmouth Junction alternative could offer marginally greater opportunities for supporting non-residential development in the study areas. For each of the two station area links, there is significant geographic overlap in the three-mile station areas.

Alignment Comparisons

When comparing the station groupings for Alignment 1A and 1B, the greatest difference between alignments is due to projected incomes associated with the potential Yarmouth Junction station, Alignment 1B (SLR), since the potential Royal Junction station was removed from consideration. Other differences between the station groupings are somewhat marginal, with differences noted between the Pineland West and East station incomes. Alignment 1B (SLR) Pineland East station sees greater projected income than Pineland West (1A – PAR).

Figure 17 Median Household and Per Capita Incomes by Potential Station Area - Projected 2026



Source: Esri and RKG (2022)

3.1.7 Selected Employment Comparisons

Potential station area comparisons of 2021 job counts by industry sector²⁷ are shown in Figure 18:

- ▶ All potential station areas have a relatively high concentration of their employment in retail and service industry sectors which are typically lower wage positions compared to office and manufacturing.
- Retail and service sectors, when combined, account for between 37% of the employment base in the Auburn station area to nearly 67% in the Lewiston station area.
- Office and manufacturing sectors, when combined, see employment ranges from 5.9% in the Auburn station area to 23% in the Lewiston station area.

Countywide employment projections were reviewed for 2022 – 2032 to place the employment distribution within each station area in perspective²⁸. As indicated in Figure 19, total employment in Androscoggin County is projected to decline by 1.3% - 676 jobs, and Cumberland County is projected to decline by 1.1% - 2,239 jobs.

Both counties are projected to realize employment losses across several selected industry sectors, most notably the retail sector at 6.7% for Androscoggin County and 15% for Cumberland County. Conversely, both are projected to experience some gains in the service sector industries, with Cumberland County also gaining in the office and manufacturing sectors.

Alignment Comparisons

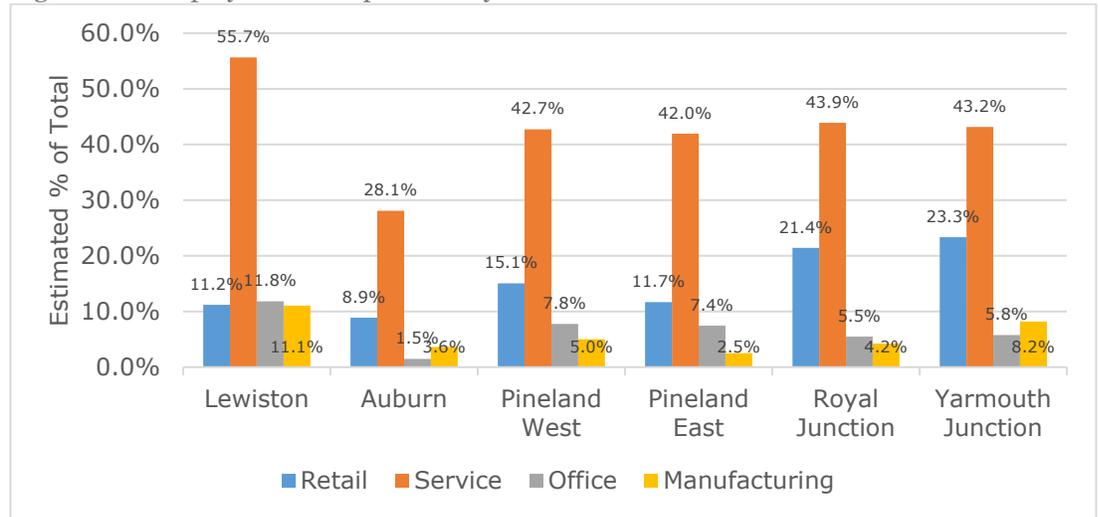
When comparing the station groupings for Alignment 1A and 1B, the greatest difference between alignments is due to estimated employment concentrations associated with the potential Yarmouth Junction station, Alignment 1B (SLR), since the potential Royal Junction station was removed from consideration. Fewer differences are apparent between Pineland West (1A) and Pineland East (1B).

As both Alignments travel through Cumberland and Androscoggin Counties, the county employment change illustrated in Figure 19 also does not necessarily indicate a clear benefit for one alignment over another.

²⁷ Retail sector includes typical shopper's goods stores and restaurants. Office sector includes finance, real estate, and insurance. Service sector includes health care and other personal and professional uses. Manufacturing sector is manufacturing uses.

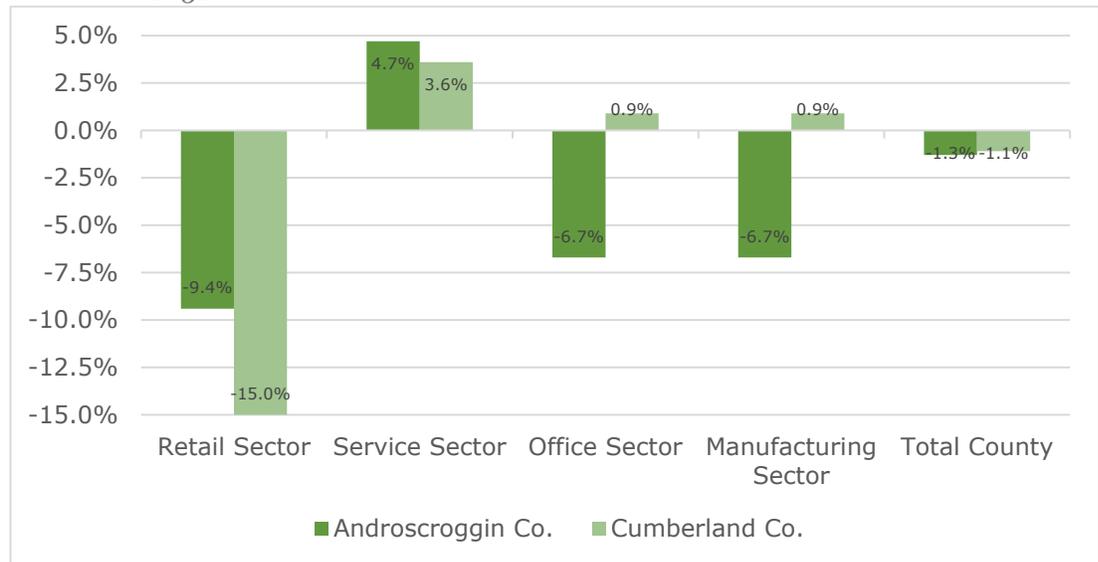
²⁸ Countywide employment projections provided by Emsi, a leading private sector vendor of employment and economic proprietary modeling.

Figure 18 Employment Comparisons by Potential Station Area - 2021



Source: Esri and RKG (2022)

Figure 19 County Employment Change for Selected Industry Sectors, Projected 2022 – 2031



Source: Emsi and RKG (2022)

3.1.8 Comparisons of Potential Service and Office Sector Development

Estimated service sector and office sector development potential are detailed by station area in Figure 20. The projected growth in service sector employment for Androscoggin County from 2022-2032 is 822 employees. The projected growth in the same sector for Cumberland County is 2,441 employees, with Cumberland County also projected to increase office sector employment by 490 employees.

For service and office sectors, the analysis held the 2021 share of jobs in each station area as a percent of the county total constant and estimated potential employment

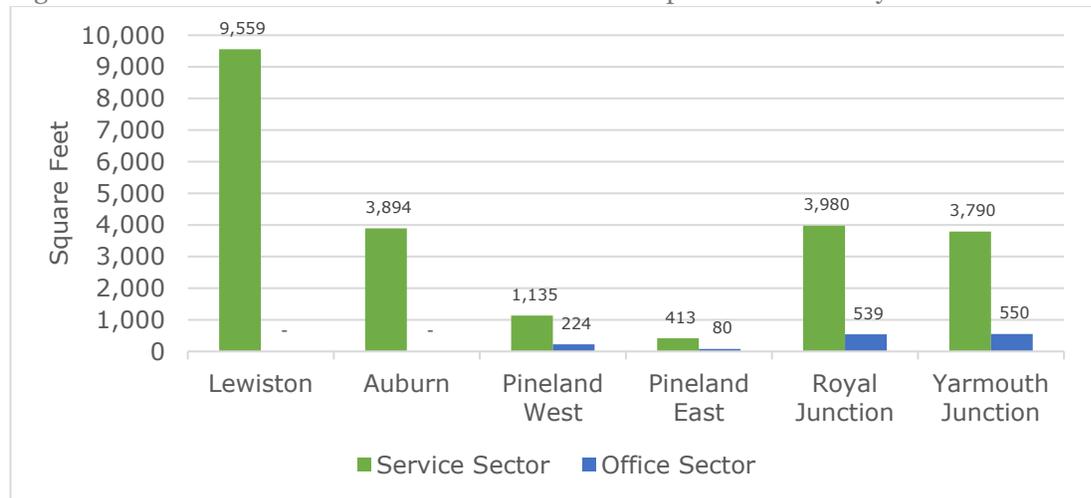
growth by sector for each station area. For example, in 2021 the service sector employment in the Lewiston station area represented 18.6% of the countywide employment in the same sector. This percentage was then applied to the county growth for employment in that sector to derive future employment by sector in the Lewiston station area. The same was done for each potential station area.

Estimated employment growth for the service sector and office sector was then translated into estimated demand for additional square feet using industry standards for space per employee.²⁹ All demand from employee growth does not necessarily equate to demand for new built space. Some demand could be captured in existing vacancies or from an expansion of existing facilities or operations. A conservative estimate found that perhaps 25% of the estimated employment growth could result in demand for new built space³⁰.

Alignment Comparisons

When comparing the station groupings for Alignment 1A and 1B, the differences between alignments are most pronounced for both sectors with Alignment 1B (SLR) Yarmouth Junction and Pineland East, compared to Alignment 1A (PAR) Pineland West station. Alignment 1A (PAR) at Pineland West sees more than double the development potential than Alignment 1B (SLR) at Pineland East. The greatest difference between alignments is due to development potential associated with the potential Yarmouth Junction station since the potential Royal Junction station was removed from consideration.

Figure 20 Estimated Service and Office Sectors Development Potential by Station Area



Source: Emsi, ULI and RKG (2022)

²⁹ For both sectors, the metric used in this analysis was an average of 250 SF per employee, reflecting RKG’s experience and as offered by the Urban land Institute (ULI).

³⁰ Any additional service or office sector development opportunities would be influenced by the availability of land or space, investor/developer interest, business interest, financial feasibility, and existing zoning. Lastly, this potential change in employment represents a 10-year period.

3.1.9 Comparisons of Potential Retail Sector Development

Estimates of retail development in square feet for each potential station area are shown in Table 19 and presented by selected sectors. This analysis approach uses estimates of sales leakage for each sector – a comparison of estimated sales for that sector relative to the estimated household spending demand for the same sector. Where there is unmet demand, or sales leakage, an opportunity may exist to re-capture a portion of it.

The analysis considered that perhaps as much as 35% of the estimated sales leakage could be re-captured by additional retail offerings. This does not necessarily indicate demand for newly built stores, as existing merchants could alter their merchandising and operations and increase their sales penetration (market share) of local spending demand. Further, such potential development would be dependent on store types and their decision criteria, and available land and applicable zoning to support such development.

For each sector presented in Figure 21, the estimated 35% capture of sales leakage was divided by typical industry average sales per square foot values and indicates:

- ▶ Potential Lewiston station – total potential is estimated to amount to approximately 1,475 square feet across limited store types³¹.
- ▶ Potential Auburn station – total potential is less than 1,000 square feet and includes secondhand and used merchandise stores.
- ▶ Potential Pineland West station – approximately 4,495 square feet of potential and across multiple store types with 49.0% of the potential for restaurants.
- ▶ Potential Pineland East station – approximately 4,580 square feet and with 73.0% in the restaurant sector.
- ▶ Potential Royal Junction station³² – slightly more than 16,530 square feet of potential with the restaurant sector accounting for 71.0% of the total potential.
- ▶ Potential Yarmouth Junction station – nearly 11,345 square feet with the restaurant sector accounting for 68.0% of the total potential.

³¹ Note that the projected opportunity for additional retail development around the Lewiston Station site (as presented in Figure 21) does not include the household spending potential of the proposed pipeline development (discussed elsewhere in this report) of 512 new units (inclusive of 140 student housing units). Excluding the 140 units of student housing and the replacement housing of 37 units, the net new pipeline residential development equates to 372 units.

This analysis considered the average annual household spending demand for these 372 units and estimates that perhaps as much as 60% of this demand (for each of the selected retail sectors) could be captured by development within the Lewiston Station area. The reasoning for the higher capture rate (60% as opposed to 35%) reflects the small 15-minute walk radius around the station and the proximity of the new households to any new or supportable additional retail development. Typically, consumers shop close to home when possible. Under these assumptions, the pipeline housing could support an approximate 1,250 SF of additional development across all of the identified retail sectors with 65% as restaurant space.

With the inclusion of the demand represented by the pipeline households, the development opportunity around the Lewiston Station area is approximately 2,715 SF across all identified retail sectors.

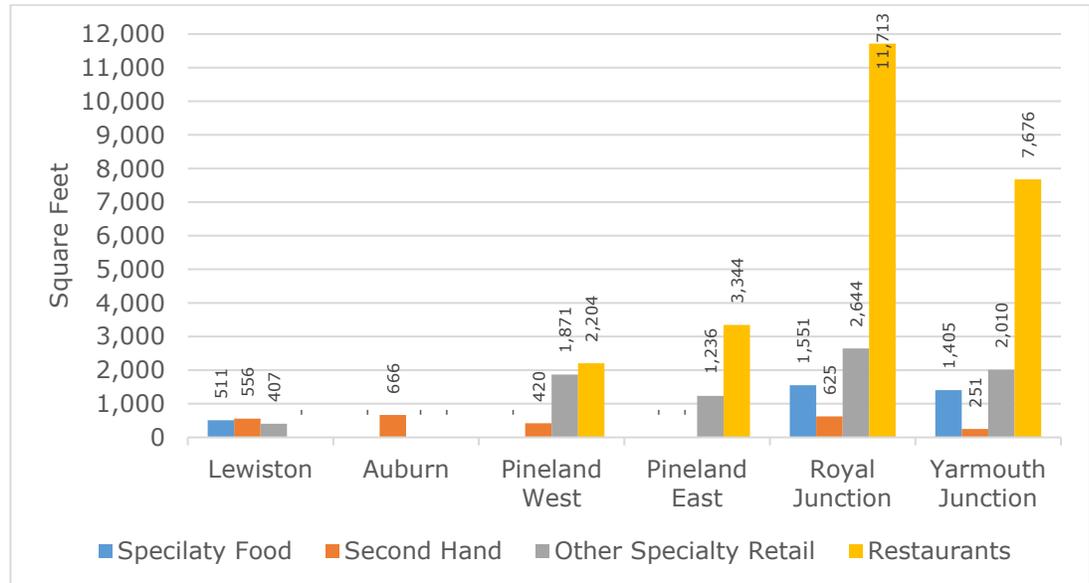
³² The Royal Junction station was removed from consideration in this study, its analysis is included throughout the report for reference.

These estimates reflect an estimated re-capture of study area household spending demand, only. While it is likely that an active commuter rail station would add daily passengers and represent some level of spending potential, this would typically be considered incremental in most retailer’s location decision criteria.

Alignment Comparisons

When comparing the station groupings for Alignment 1A and 1B, some differences are noted between Pineland West and Pineland East station areas for restaurant sector development potential - Alignment 1B (SLR) at the Pineland East station area estimates greater restaurant sector development potential than Alignment 1A (PAR) at Pineland West. Conversely, Alignment 1A (PAR) at the Pineland West station area estimates greater other specialty retail than Alignment 1B (SLR). However, the greatest difference between alignments is due to development potential associated with Yarmouth Junction, since the potential Royal Junction station was removed from consideration.

Figure 21 Estimated Retail Sector Development Potential by Station Area for Selected Sectors



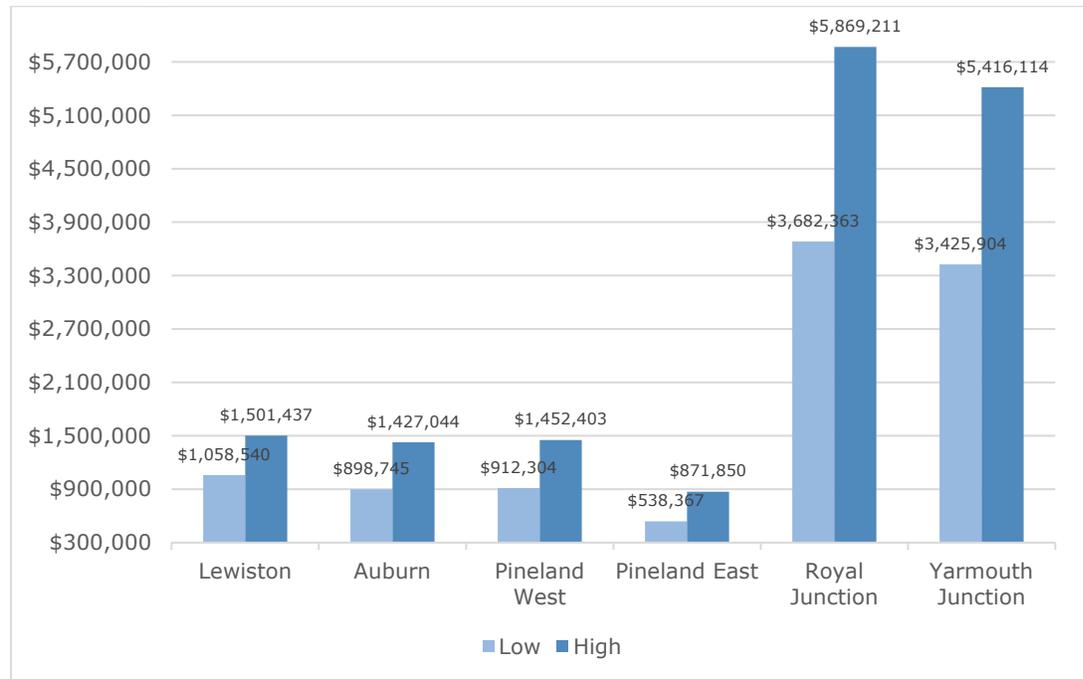
Source: Esri, Urban Land Institute (ULI) and RKG (2022)

3.1.10 Estimates of Selected Retail Spending Demand from Households and Employees

The previously identified potential for additional housing (owner and renter) around each potential station area is also likely to result in an increase in household spending demand. This analysis considered the average annual retail spending demand per household for each station area, excluding automotive and gas. This average demand per household was then applied against the estimated potential “new” housing, above the baseline, for each station area in order to develop an estimate of additional retail spending demand³³.

The estimated change in household retail spending demand, by station area, is presented in Figure 22. These range greatly from a low of \$538,400 at Pineland East, to a high of \$5.87 million at Royal Junction.

Figure 22 Estimated Change in Household Retail Spending Demand by Potential Station Area



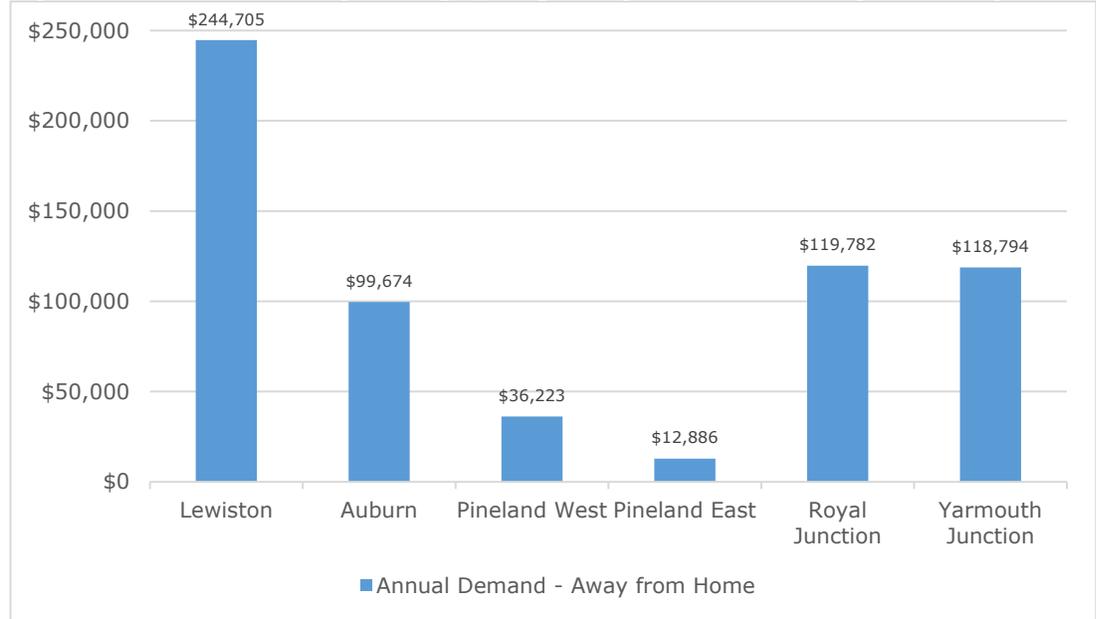
Source: Esri, Urban Land Institute (ULI) and RKG (2022)

Similarly, the previously identified potential employment increase for each potential station area would result in some increase in average annual daily employee spending demand. For this analysis, the analysis considered the average annual spending demand

³³ For example, for the Lewiston station area the estimated average annual retail demand is \$10,611/household. Under the previously identified and discussed assumptions the potential for additional housing within the Lewiston Station area is between 100 and 142 units. This results in an approximate \$1.06 to \$1.50 million (annually) in local area retail household spending demand over a five-year period.

of approximately \$1,600³⁴ for dining and drinking establishments and applied this to the estimated employment increases as reflected in Figure 23 – ranging from a low of \$12,900 (Pineland East) to a high of nearly \$245,000 (Lewiston). As with potential employment change, this spending demand is incremental over a ten-year period.

Figure 23 Estimated Change in Employee Spending Demand for Dining & Drinking



Source: Esri, Urban Land Institute (ULI), International Council of Shopping Centers (ICSC) and RKG (2022)

Alignment Comparisons

When comparing the station groupings for Alignment 1A and 1B, the differences between station groupings are significant. Alignment 1A (PAR) at Pineland West sees nearly double the estimated change in employee spending as Alignment 1B (SLR) at Pineland East. Alignment 1A (PAR) at Pineland West also has a higher estimated change in employee spending demand for drinking and dining than Alignment 1B (SLR) at Pineland East. However, the greatest difference between alignments is due to estimated employee spending change associated with Yarmouth Junction, since the potential Royal Junction station was removed from consideration.

³⁴ As identified by the ICSC (International Council of Shopping Centers) and ULI (Urban Land Institute).

3.2 Fiscal and Economic Benefits

Estimates of future fiscal and economic benefits were calculated for each of the potential station areas, based on the addition of new residents, housing units, commercial space, and jobs. For each potential station area, there is a low and high estimate which uses the different growth rates for population and housing as discussed earlier in this report.

Table 25 compares the estimated fiscal and economic benefits associated with each station area which result from potential development opportunities as identified in this analysis. These include estimates of new owner and renter housing units, the resulting change in estimated household spending demand, the potential for new non-residential development, as well as potential employee spending

From a fiscal benefit perspective, the analysis considered the potential for new development and developed an estimate of property values for such development. FY 2022 local property tax rate for each community was then applied to arrive at an estimate of property tax receipts should all development be realized.

As observed in Table 25, the estimated economic and fiscal impacts vary by station study area. These variations are primarily a reflection of (1) the difference in Baseline housing (unit count) and the potential for additional housing (excluding pipeline housing) for each station study area, and (2) the resulting potential growth in housing as estimated from differing "capture rates" of countywide growth by tenure. The change in household spending also differs as the estimated annual per household retail spending for each station study area differs.

While potential non-retail employment differs for each area, a constant factor of approximately \$1,600/employee/year forms the basis for estimating additional consumer spending demand.

County average building permit values by type of use provide the estimated potential changes in property valuations, which then form the basis for estimating tax receipts as based on each jurisdiction's FY 2022 tax rate to arrive at the varying estimates of gross property taxes for residential. This also accounts for the differences in estimated non-residential property tax receipts along with the absolute estimate of new SF of development for each station area.

The following Table 26 provides a cumulative comparison of the estimated economic and fiscal impacts resulting from selected "groupings" of specific station areas.

Table 25 Comparative Estimates of Economic and Fiscal Benefits per Potential Station Area

Summary Comparison of Potential Benefits by Potential Station Study Area	Lewiston	Auburn	Pineland West 1A	Pineland East 1B	Royal Junction 1A	Yarmouth Junction 1B
	Low - High	Low - High	Low - High	Low - High	Low - High	Low - High
New Housing¹	100 – 141	37 – 58	29 – 47	17 – 26	93 – 149	85 – 172
Owner Units	7 – 11	26 - 43	21 - 35	13 - 22	68 – 113	60 – 135
Renter Units	93 – 130	11 - 15	8 - 12	4 – 4	25 – 36	25 - 37
Change in HH Spending in \$1,000's	\$1,058.5 - \$1,501.4	\$898.7 - \$1,427.0	\$912.3 - \$1,452.4	\$538.4 - \$871.9	\$3,682.4 - \$5,869.2	\$3,425.9 - \$5,416.1
Development Potential	11,033	4,559	5,854	5,073	21,052	15,682
Retail SF	1,474	666	4,494	4,580	16,533	11,342
Non-Retail SF ²	9,559	3,894	1,359	493	4,519	4,340
Potential Employment ³	153	62	23	8	75	74
Potential Spending Demand	\$244,705	\$99,674	\$36,223	\$12,886	\$119,782	\$118,794
Potential Fiscal Impacts (FY22)	Low - High	Low - High	Low - High	Low - High	Low - High	Low - High
Owner Value ⁴	\$1,434.64 - \$2,254.44	\$5,328.67 - \$8,812.80	\$6,188.00 - \$10,313.33	\$3,830.67 - \$6,482.67	\$20,037.33 - \$33,297.33	\$17,680.00 - \$39,779.99
Renter Value ⁵	\$12,236.90 - \$17,105.34	\$1,447.37 - \$1,973.69	\$963.44 - \$1,445.16	\$481.72 - \$481.72	\$3,010.74 - \$4,335.47	\$3,010.74 - \$4,455.90
Total Residential Value \$1,000's	\$13,671.54 - \$19,359.77	\$6,776.04 - \$10,786.49	\$7,151.44 - \$11,758.49	\$4,312.38 - \$6,964.38	\$23,048.07 - \$37,632.79	\$20,690.74 - \$44,235.89
Estimated Gross Property Tax	\$386,358 - \$547,107	\$161,405 - \$256,934	\$98,690 - \$162,267	\$59,511 - \$96,109	\$473,638 - \$773,354	\$409,677 - \$875,871
Retail Value/SF	\$150	\$150	\$150	\$150	\$150	\$150
Non-Retail	\$225	\$225	\$225	\$225	\$225	\$225
Total Non- Residential Value \$1,000's	\$2,371.82	\$975.87	\$980.02	\$797.95	\$3,496.78	\$2,677.75
Estimated Gross Property Tax	\$67,028	\$23,245	\$13,524	\$11,012	\$71,859	\$53,019

Source: Maine Revenue Services, US Census Bureau and RKG (2022)

(1) - Excludes pipeline housing and reflects change over Baseline

(2) - Excludes manufacturing

(3) - Excludes retail

(4) - Reflects an estimated average (2017-2021) building permit value/unit in \$1,000's - Androscoggin (\$204,950) and Cumberland (\$294,670) - single family homes

(5) - Reflects an estimated average (2017-2021) building permit value/unit in \$1,000's - Androscoggin (\$131,580) and Cumberland (\$120,430) - 5+multi-family homes.

(6) – In Table 25, the following inputs and assumptions should be noted³⁵.

-
- ³⁵
1. The estimated additional owner units and residential units reflect a five-year change in units above the Baseline estimate of the same number of units for each station area.
 2. The estimated change in household spending demand (for retail goods/services) reflects the average demand per household as applied to the change in total households.
 3. Retail development (SF) potential accounts for an estimate of the total supportable retail, specifically for restaurants, specialty stores, second-hand stores, and specialty food stores, through a recapture of existing sales leakage (consumers shopping outside of the study area).
 4. Non-residential development (SF) potential is an estimate of total supportable development in the service and office industry sectors as based on estimates of employment growth within each of those sectors.
 5. Employment growth (office and service sectors) reflects a local (station area) capture of countywide employment growth over a ten-year period.
 6. Employee spending estimates account for the average annual expenditures by employees, for selected retail/restaurant spending, during their time at work (annually) at approximately \$1,600/employee.
 7. Fiscal impacts (property tax receipts) are a measure of the likely taxes associated with the estimated new development by type of use, residential and non-residential.
 8. All estimates of property tax receipts are gross estimates and do not account for any additional municipal services costs or additional education costs that may result from the development.
 9. Gross property tax estimates are reported in absolute dollars (not in per \$1,000's)

Note that both the estimated economic and fiscal benefits, where applicable, are expressed in constant dollars, and further, that such benefits would likely occur over time. As noted previously, much of the growth in housing units reflects a re-distribution of projected countywide growth. As a result, while the residential property tax estimates may be new to the station area, they may not necessarily be new to the county.

These valuations reflect a cost-based approach to valuation (i.e., construction costs). For non-residential development, local assessors typically apply an income-based approach to valuation as tenants become known along with their lease rates and other associated operating costs.

Table 26 Selected Groupings of Potential Station Areas and Estimated Economic and Fiscal Benefits

Summary Comparison of Potential Benefits – by Station Study Area	Option 1 - Lewiston & Auburn	Option 2 - Lewiston & Auburn & Pineland West	Option 3 - Lewiston & Auburn & Yarmouth Junction	Option 4 - Lewiston & Auburn & Pineland East & Yarmouth Junction
	Low – High	Low – High	Low – High	Low – High
New Housing¹	137 – 199	166 – 246	222 – 371	239 – 397
Owner Units	33 – 54	54 – 89	93 – 189	106 – 211
Renter Units	104 – 145	112 – 157	129 – 182	133 – 186
Change in HH Spending in \$1,000's	\$1,957.3 - \$2,928.5	\$2,869.6 - \$4,380.9	\$5,383.2 - \$8,344.6	\$5,921.6 - \$9,216.4
Development Potential	15,592	21,446	31,274	36,347
Retail SF	2,139	6,634	13,481	18,062
Non-Retail SF ²	13,452	14,812	17,792	18,285
Potential Employment³	215	238	289	298
Potential Spending Demand	\$344,379	\$380,602	\$463,173	\$476,059
Potential Fiscal Impacts (FY22)	Low – High	Low – High	Low – High	Low – High
Owner Value ⁴	\$6,763.31 - \$11,067.23	\$12,951.31 - \$21,380.56	\$24,443.31 - \$50,847.23	\$28,273.97 - \$57,329.89
Renter Value ⁵	\$13,684.27 - \$19,079.03	\$14,647.71 - \$20,524.19	\$16,695.01 - \$23,534.93	\$17,176.73 - \$24,016.64
Total Residential Value \$1,000's	\$20,447.58 - \$30,146.26	\$27,599.01 - \$41,904.75	\$41,138.32 - \$74,382.15	\$45,450.70 - \$81,346.54
Estimated Gross Property Tax	\$547,763 - \$804,041	\$646,453 - \$966,308	\$957,440 - \$1,679,912	\$1,016,950 - \$1,776,020
Retail Value/SF	\$150	\$150	\$150	\$150
Non-Retail Value/SF	\$225	\$225	\$225	\$225
Total Non- Residential Value \$1,000's	\$3,347.69	\$4,327.71	\$6,025.44	\$6,823.40
Estimated Gross Property Tax	\$90,273	\$103,797	\$143,292	\$154,304

Source: Maine Revenue Services, US Census Bureau and RKG (2022)

(1) - Excludes pipeline housing and reflects change over Baseline

(2) - Excludes manufacturing

(3) - Excludes retail

(4) - Reflects an estimated average (2017-2021) building permit value/unit in \$1,000's - Androscoggin (\$204,950) and Cumberland (\$294,670) - single family homes

(5) - Reflects an estimated average (2017-2021) building permit value/unit in \$1,000's - Androscoggin (\$131,580) and Cumberland (\$120,430) - 5+multi-family homes

3.2.1 Ridership and Revenues

Ridership estimates, based on the 2019 study, indicate that there may be a minimum of four daily round trips of intercity-style passenger rail, and a range of twelve to twenty daily round trips of transit-style rail, between Lewiston and Portland, Maine. Table 27 outlines the ridership and revenues based on the range of potential round trips. For example, in 2025, these could result in daily intercity-style round trip ridership of 210 (low) to as much as 240 (high). Projections for 2040 indicate a daily ridership of 250 (low) to as much as 330 (high). Round trip ticket prices may range from \$12.00 (low) to as much as \$20.00 (high).³⁶ Under these assumptions and inputs, the potential daily ticket revenue for 2025 could range from \$2,520 to \$4,800 and for 2040 from \$3,000 to \$6,600 (all in constant 2019 dollars).³⁷

Table 27 Ridership and Revenue Estimates (2025 and 2040)

	2025 Ridership Range		2040 Ridership Range	
	Daily Rail Trips	Potential Daily Ticket Revenue	Daily Rail Trips	Potential Daily Ticket Revenue
	Low - High	Low - High	Low - High	Low - High
12-20 Transit-Style Service Trips	600 - 800	\$7,200 - \$16,000	700 - 1900	\$8,400 - \$38,000
Up to 4 Intercity-Style Service Trips	210 - 240	\$2,520 - \$4,800	250 - 330	\$3,000 - \$6,600

Source: Operating Plans and Corridor Assessments (May 2019)

3.3 Other Considerations and Transit Benefits

Prior research has indicated that increased commuter rail service can result in the following positive economic impacts and subsequent consequences and considerations.³⁸ These benefits are often considered when applying for federal funding on rail capital projects.

3.3.1 Safety Benefits

A primary consideration of many transportation infrastructure improvement projects is to reduce both the number and severity of crashes on the facility thereby reducing the likelihood of fatalities, injuries, and property damage that may result. It can be assumed

³⁶ RKG’s experience and knowledge of ticket prices (as derived from the Downeaster Amtrak service) suggest that these variations could be a result of the combination of any of the following: (1) the length of travel from station of departure to station of arrival; (2) class of ridership (coach or business); and (3) the potential for ticket discounts reflecting age or other status of the rider.

³⁷ Note to the reader – estimated ticket price range as provided by VHB and are not inflation adjusted and actual “real” ticket prices for 2025 and 2040 are subject to revision. They are presents herein as constant 2019 dollars to offer a baseline and comparative estimate.

³⁸ RKG referred to the report Benefit-Cost Analysis Guidance for Discretionary Grant Programs, as prepared by the U.S. Department of Transportation (as revised March 2022).

that a reduction in vehicular traffic may subsequently lead to improved safety outcomes. In order to estimate potential safety benefits, it is important to demonstrate how a proposed project - in this case the return of rail services - is expected to improve safety outcomes specific to the study corridor. This would typically require a more detailed discussion about various crash causation factors addressed by a proposed project and then to establish a clear link to how the proposed project mitigates these risk factors that are location-specific.

Although an analysis of the number of crashes by type and cause is beyond the scope of this study, Figure 24 highlights monetized values (in 2020 dollars) each crash incident costs the economy. For example, the KABCO injury scale³⁹ notes that each fatal crash has an economic impact equivalent to \$11.6 million while a crash resulting in no injuries has an impact of \$3,900. By investing in transportation improvement projects that both reduce the overall number of crashes in a corridor and the severity of those crashes, negative economic impacts may also be reduced.

³⁹ The KABCO injury scale was developed by the Federal Highway Administration to assess the severity of a vehicle accident and decide any settlement as determined level of severity of the accident and/or injury. Reportedly, local law enforcement data is frequently using the KABCO scale. Source: Benefit-Cost Analysis Guidance for Discretionary Grant Programs, Table A-1, p.35 (2022).

Figure 24 Estimated Value of Reduced Fatalities and Injuries

Recommended Monetized Value(s)		References and Notes
KABCO Level	Monetized Value (2020 \$)	<p><i>Treatment of the Economic Value of Preventing Fatalities and Injuries in Preparing Economic Analyses (2021)</i></p> <p>https://www.transportation.gov/office-policy/transportation-policy/revised-departmental-guidance-on-valuation-of-a-statistical-life-in-economic-analysis</p> <p>Note: The KABCO level values shown result from multiplying the KABCO-level accident’s associated MAIS-level probabilities by the recommended unit Value of Injuries for each MAIS level, and then summing the products. Accident data may not be presented on an annual basis when it is provided to applicants (i.e. an available report requested in Fall 2011 may record total accidents from 2005-2010). For the purposes of the BCA, is important to annualize data when possible. For MAIS-based unit values, please see the VSL guidance linked above.</p>
O – No Injury	\$3,900	
C – Possible Injury	\$77,200	
B – Non-incapacitating	\$151,100	
A – Incapacitating	\$554,800	
K – Killed	\$11,600,000	
U – Injured (Severity Unknown)	\$210,300	
# Accidents Reported (Unknown if Injured)	\$159,800	
Crash Type	Monetized Value (2020 \$)	
Injury Crash ¹	\$302,600	
Fatal Crash ¹	\$12,837,400	
<p>1) Monetization values for injury crashes and fatal crashes are based on an estimate of approximately 1.44 injuries per injury crash and 1.09 fatalities per fatal crash, based on an average of the most recent five years of data in NHTSA’s National Crash Statistics. The fatal crash value is further adjusted for the average number of injuries per fatal crash.</p>		

Source: Benefit-Cost Analysis Guidance for Discretionary Grant Programs (US DOT, 2022)

Many transportation infrastructure improvement projects are often designed and built with the goal of reducing travel time for users of the system. These travel time savings improvements may include improved traffic flow, increased transit vehicle operating speeds⁴⁰, decreased transit service headways, or providing faster connections between destinations.

The estimation of travel time savings was beyond the scope of work of this economic impact analysis. However, the analysis did find studies that provided estimates of value of time which is described in Table 28. A 2009 study⁴¹ completed by the Florida Department of Transportation offered an analysis of the relative dollar value of time for

⁴⁰ Traffic volume and congestion are non-linear. On highways, traffic can maintain high speeds over a broad range of traffic densities. However, when densities reach and exceed design levels, speeds drop suddenly. Therefore, it is possible for relatively small reductions in traffic volumes, as may be realized through an increase or availability of transit rail services, could generate large improvements in speed.

⁴¹ Synthesis of Research on Value of Time and Value of Reliability, as prepared by the Florida Department of Transportation, Center for Urban Transportation Research (dated January 2009).

personal travel, including commuter travel, as 50% of the area’s average weekly prevailing wage.

An estimate of average savings or value of time (VOT) was developed with a review of the average weekly wages for Androscoggin and Cumberland Counties. For the two-county region the average VOT was \$16.18/hour (see Table 28).

Table 28 Calculated Estimation of Value of Time

Average Wages – 4Q 2021	Weekly Wages¹	Hourly Wage²	Value of Time³
United States	\$1,418	\$35	\$17.73
Maine	\$1,163	\$29	\$14.54
Androscoggin Co.	\$1,058	\$26	\$13.23
Cumberland Co.	\$1,355	\$34	\$16.94
Two-County Average	\$1,294	\$32	\$16.18

Source: U.S. Bureau of Labor Statistics and RKG (2022)

(1) Excludes the self-employed

(2) Assumes a 40 hour work week

(3) Typically considered at one-half of the prevailing hourly wage

This estimate of \$16.18/hour is generally comparable to the national standard of \$16.20/hour (although in 2020 dollars) as cited in the U.S. Department of Transportation’s report, *Benefit-Cost Analysis Guidance for Discretionary Grant Programs*.⁴²

The same report offered a formula⁴³ for quantifying the value of trip time savings (VTTS) for new riders⁴⁴ as follows (assumed annual):

$$VTTS \text{ (new)} = \text{Value of Time} \times 0.50 \times \text{change in trip time} \times \text{affected trips}$$

For illustrative purposes only, in a hypothetical scenario in this analysis, the following assumptions were made:

1. Value of Time = \$16.18/hour
2. Change in trip time equals 30 minutes (or one-half hour)
3. Number of affected trips = 10,000 annually
4. \$404,500 = \$16.18/hour X 0.50 X 0.50 X 10,000

⁴² Appendix Table A-3: Value of Travel Time Savings, Benefit-Cost Analysis Guidance for Discretionary Grant Programs, as prepared by the U.S. Department of Transportation, revised March 2022, Page 36.

⁴³ Appendix B: Sample Calculations, Benefit-Cost Analysis Guidance for Discretionary Grant Programs, as prepared by the U.S. Department of Transportation, revised March 2022, Page 48.

⁴⁴ In this analysis it is specifically assume that all riders would be considered as new since passenger rail service is not currently available for either of the two Alignment options under consideration.

These are illustrative and hypothetical only, as estimates of change(s) in trip times and number of trips – both of which are yet to be determined.

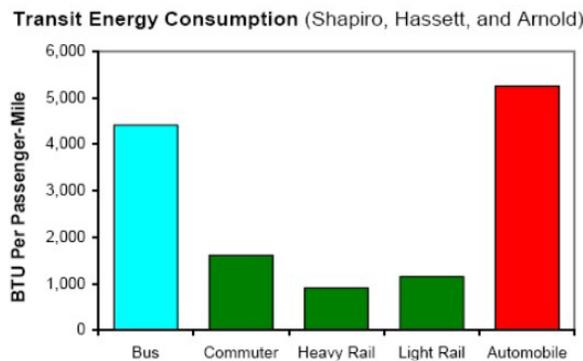
3.3.2 Energy and Emission Reductions

Transportation infrastructure projects may also reduce the transportation system’s impact on the environment by lowering emissions of air pollutants that result from production and combustion of transportation fuels. The economic damages caused by exposure to air pollution represent externalities, as their impacts are borne by society as a whole, rather than by the travelers and operators whose activities generate those emissions. Transportation projects that reduce overall fuel consumption, either due to improved fuel economy or reduction in vehicle miles traveled, will typically also lower emissions, and may thus produce climate benefits and other environmental benefits.

Rail transit achieves energy use reductions and lowers emissions in two ways, depicted in Figure 25:

- ▶ First, rail transit consumes less energy (in British Thermal Units of BTUs)⁴⁵ per passenger-mile than bus or automobile traffic.
- ▶ Second, since rail transit reduces congestion, it leverages even further reductions in fuel use and emissions associated with non-rail travel. A study of transit energy consumption⁴⁶ found that automobile travel results in the most inefficient energy use with an average consumption of more than 5,000 BTUs per passenger mile. This compares to the approximate usage of 1,500 BTUs per passenger mile for commuter rail.

Figure 25 Comparative Transit BTUs – Energy Efficiency by Mode of Transit



⁴⁵ BTU is typically considered as the amount of heat (energy) required to raise the temperature of one pound of water by one degree Fahrenheit.

⁴⁶ As reported in a research paper entitled Transportation, Social and Economic Impacts of Light and Commuter Rail, as prepared by the Texas Transportation Institute of Texas A&M University.

Currently in 2022, the monetary value of 100 BTUs is understood to be equivalent to approximately \$16.68, compared to \$14.96/100 BTUs in 2021. This represents an increase of \$1.72/100 BTUs or nearly an 11.5% increase in just one year. As a result, it is reasonable to assume that in the near term the \$/100 BTUs will likely continue to increase.

Under these inputs, and the comparative BTU metrics presented in Figure 25, **the cost savings, on a per passenger mile, between commuter rail transit and automobile transit equate to nearly \$584**, as follows:

- ▶ Automobile - 5,000 BTUs per passenger mile X \$16.68/100 BTUs = \$834
- ▶ Commuter Rail - 1,500 BTUs per passenger mile X \$16.68/100 BTUs = \$250

3.3.3 Affordable Mobility

With the rising costs of fuel, maintenance, and lease/purchase prices for personal automobiles, public transportation can be a more affordable travel option particularly for low- to moderate-income individuals and households. While this savings varies by city, location, and type of rail service, it is generally acknowledged that transit use can help reduce the portion of household income utilized for transportation. A potential reduction in household expenditures for transportation could translate to greater income availability for housing, consumer spending, education, childcare, healthcare, and other annual household expenditures.

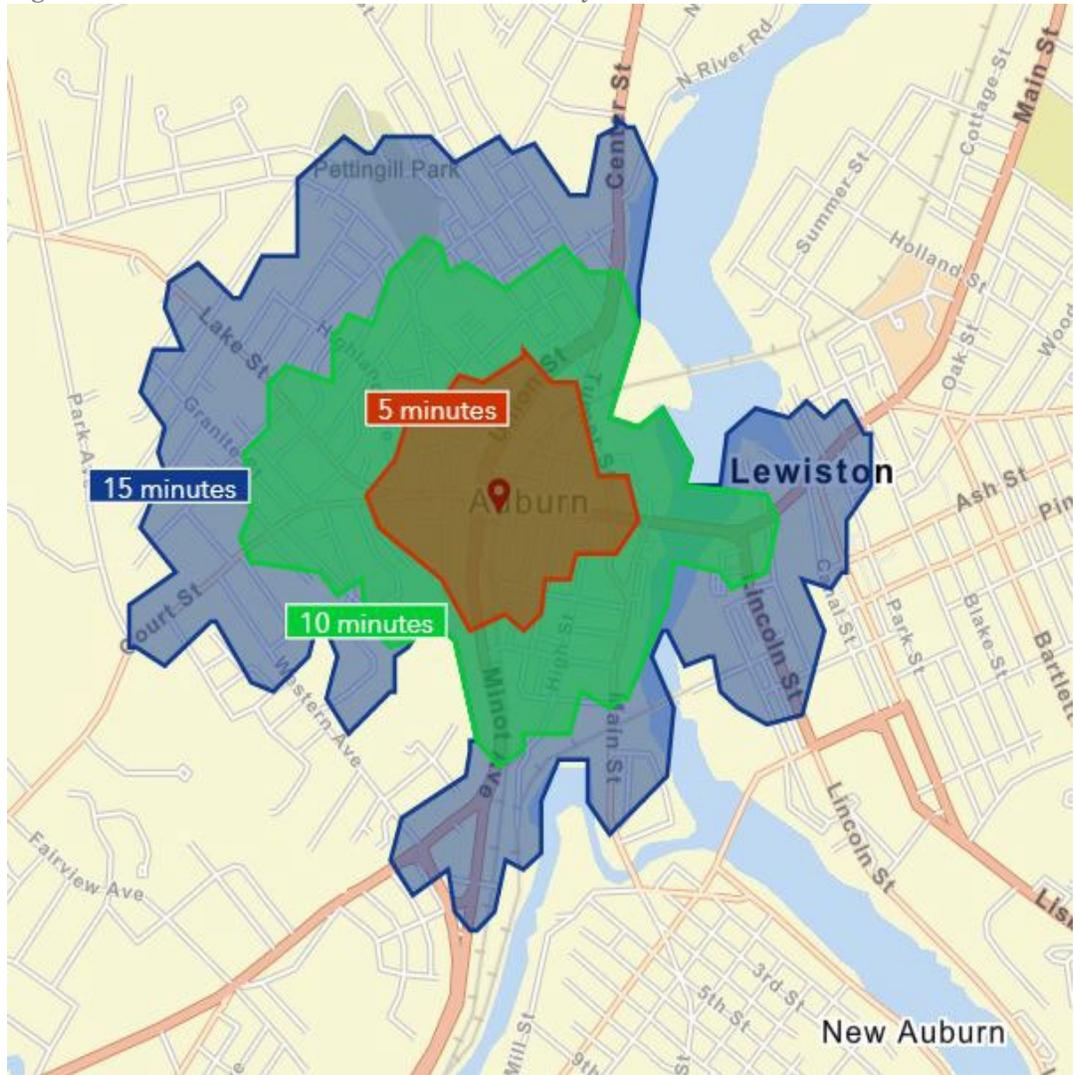
As discussed, a detailed monetization of these Transit Benefits may require additional data input, research, and modeling specific to either of the two Alignment options. They nonetheless represent overall benefit(s) that may be realized from the introduction of rail services.



APPENDIX A: POTENTIAL AUBURN URBAN STATION AREA

At the request of representatives of the City of Auburn, Maine, a separate potential station location has been offered in the downtown area, which is in addition to the Auburn Park and Ride location identified in the main body of this report. This urban station site reflects metrics for an approximate 15-minute walk time about the site, depicted in Figure 26. The methodology and approach to the analyses for this Auburn Urban station area is the same as that what was used for all other sites in this report, with one exception. This station area analysis used a 15-minute walk area, akin to the Lewiston site, rather than a 3-mile radius.

Figure 26 Potential Auburn Urban Station Study Area



Selected Comparative Socio-Economic Metrics

Comparative metrics for the potential Auburn Urban station area and Androscoggin County are summarized in Table 29, noting the following:

- ▶ **Population** – Population growth is projected over the 2021 - 2026 time-period in both the Auburn Downtown station area and Androscoggin County, although somewhat higher for the study area. Unlike the county projections, population growth is estimated for all of the selected age cohorts within the study area⁴⁷.
- ▶ **Housing** – Growth is projected for overall housing units in both the station study area and the county (2021 – 2026). The rate of overall increase in the county is projected at a rate double the study area however, the projected the study area sees a greater rate of change in owner and renter households. Owner households in the study area are projected to represent nearly 29.0% of the households in 2026, with renter households accounting for 71.0% of the households.

The City of Auburn has identified approximately 334 housing units that are planned or otherwise in the pipeline, with approximately 184 units within the Auburn Downtown station area – these have not been factored into the above but are addressed elsewhere in this analysis. The remaining 150 units are considered to be part of the 3-mile radius (Park and Ride) station location.

- ▶ **Owner Home Values** –Owner *median* home values are projected to be relatively similar for the study area and the county by 2026, although approximately \$15,500 less in the study area. Conversely, by 2026, owner *average* home values in the study area exceed those for the county by approximately \$15,875.
- ▶ **Incomes – Median household income and per capita income are lower within the study area, potentially reflective an overall younger population base as compared to the county. The lower income projections may also be reflective of a greater concentration of renter households – 71.0% for the study are as contrasted to 35.0% for the county, by 2026.**
- ▶ **Business Diversity (2021)** –Businesses and employment diversification is concentrated in the service sector in the study area, at 42.6% and 46.3%, respectively. This is followed by the retail sector at 19.8% and 17.1%, respectively. **Typically, these sectors represent lower paying wages when compared to other sectors and may present affordability constraints to home ownership.** The analysis estimates that the projected countywide employment growth from 2022 to 2031 could result in demand for an approximate 4,630 SF of development in the study area.

⁴⁷ Note that the projected population growth for the study area cohort aged 65+ is less than the county and median age(s) within the study area, covering all years, are also less.

Table 29 Potential Auburn Urban Station Area - Selected Comparative Socio-Economic Metrics

Selected Comparative Metrics	Potential Auburn Station Area (1)				Androscoggin County				Auburn as % of County		
	2010	2021	2026	% Δ 2021-2026	2010	2021	2026	% Δ 2021-2026	2010	2021	2026
Total Population	5,426	5,931	6,032	1.7%	107,702	110,157	111,367	1.1%	5.0%	5.4%	5.4%
Aged 20 to 34	1,355	1,456	1,462	0.4%	19,926	20,555	19,747	-3.9%	6.8%	7.1%	7.4%
Aged 35 to 54	1,388	1,360	1,371	0.8%	31,470	27,462	27,221	-0.9%	4.4%	5.0%	5.0%
Aged 65 and older	652	1,084	1,187	9.5%	15,184	20,660	23,419	13.4%	4.3%	5.2%	5.1%
Median age	33.9	36.5	37.3	2.2%	39.8	41.7	42.5	1.9%	85.2%	87.5%	87.8%
Total Housing Units	2,893	2,954	2,981	0.9%	49,090	50,907	51,761	1.7%	5.9%	5.8%	5.8%
Owner households	716	724	760	5.0%	28,544	29,178	30,183	3.4%	2.5%	2.5%	2.5%
Renter households	1,733	1,876	1,904	1.5%	15,771	16,731	16,470	-1.6%	11.0%	11.2%	11.6%
Owner Median Value	N-A	\$189,311	\$241,337	27.5%	N-A	\$186,029	\$256,839	38.1%	N-A	101.8%	94.0%
Owner Average Value	N-A	\$232,337	\$311,819	34.2%	N-A	\$223,163	\$295,945	32.6%	N-A	104.1%	105.4%
Median Household \$	N-A	\$39,944	\$44,375	11.1%	N-A	\$57,448	\$64,252	11.8%	N-A	69.5%	69.1%
Per Capita \$	N-A	\$27,644	\$31,658	14.5%	N-A	\$31,310	\$35,333	12.8%	N-A	88.3%	89.6%
	Firms	Employees	Emp/Firm	% Of Firms	Firms	Employees	Emp/Firm	% Of Firms			
Totals (2021)	363	4,940	13.6	100.0%	3,773	53,446	14.2	100.0%	9.6%	9.2%	96.1%
Retail sector	62	977	15.8	17.1%	860	11,206	13.0	22.8%	7.2%	8.7%	120.9%
Office sector	47	863	18.4	12.9%	348	3,552	10.2	9.2%	13.5%	24.3%	179.9%
Service sector	168	2,104	12.5	46.3%	1,495	23,342	15.6	39.6%	11.2%	9.0%	80.2%
Manufacturing sector	12	257	21.4	3.3%	151	5,965	39.5	4.0%	7.9%	4.3%	54.2%
Other	74	739	10.0	20.4%	919	9,381	10.2	24.4%	8.1%	7.9%	97.8%

Source: Esri and RKG (2022)

(1) 15-Minute Walk Time about the potential station location

N-A - Data suppressed or otherwise unreported

Residential Development Potential

Utilizing the previously discussed methodology, Table 30 presents estimates of additional housing, relative to the baseline, that may result from the desirability and amenities of a location that is proximate to an Auburn Downtown station site. Ultimately, additional residential development opportunities would depend on available land, or land assemblages, for such development, investor/developer interest and determinations of market and financial feasibility, as well existing zoning regulations.

The previously identified 184 pipeline units within the Auburn Downtown station area has not been factored into the following estimates.

Table 30 Potential Auburn Urban Station - Estimated Residential Development Potential

Potential Auburn Station Study Area	Baseline # of Units	As % of County (1)	As % of County (2)
2021 - 2026 Residential			
Total Housing Units	64	123	150
Owner households	36	47	55
Renter households	28	76	95

Source: Esri and RKG (2022)

(1) Increase 2026 representation of county by 1.15% for owner and 1.25% for renter

(2) Increase 2026 representation of county by 1.25% for owner and 1.35% for renter

Retail Comparisons and Development Potential

Retail sales within the selected sectors are strong within the study area, noting that sales leakage is present among other specialty retail stores, only (see Table 31). That is not to indicate that opportunities may not exist for additional development in the other sectors capitalizing on an existing strength. It is estimated that a potential recapture of sales leakage in the other specialty retail sector could result in 897 SF of development in the study area.

Table 31 Potential Auburn Urban Station - Selected Retail Demand and Sales Comparisons

Selected Retail Sector Comparative Metrics (in \$1,000's)	Auburn Station (1)			Androscoggin County			Auburn as % of Co.	
	Demand	Sales	Import (Export)	Demand	Sales	Import (Export)	Demand	Sales
Total	\$6,859.6	\$17,966.7	\$11,107.1	\$174,595.6	\$233,168.7	\$48,573.1	3.9%	8.1%
Specialty food stores (2)	\$604.3	\$1,504.6	\$900.3	\$15,084.3	\$63,266.6	\$48,182.4	4.0%	2.4%
Secondhand stores (3)	\$357.3	\$410.8	\$53.5	\$9,245.0	\$7,995.9	(\$1,249.1)	3.9%	5.1%
Other specialty retail (4)	\$1,030.9	\$351.8	(\$679.1)	\$28,077.5	\$14,553.9	(\$13,523.6)	3.7%	2.4%
Restaurants (5)	\$4,867.1	\$15,699.5	\$10,832.3	\$122,188.9	\$137,352.3	\$15,163.5	4.0%	11.4%

Source: Esri and RKG (2022)

(1) 15-Minute Walk Time about the potential station location

(2) includes meat and fish markets, produce, bakeries and confectioneries and nuts as example

(3) includes used merchandise, consignment shops and charitable thrift stores as examples

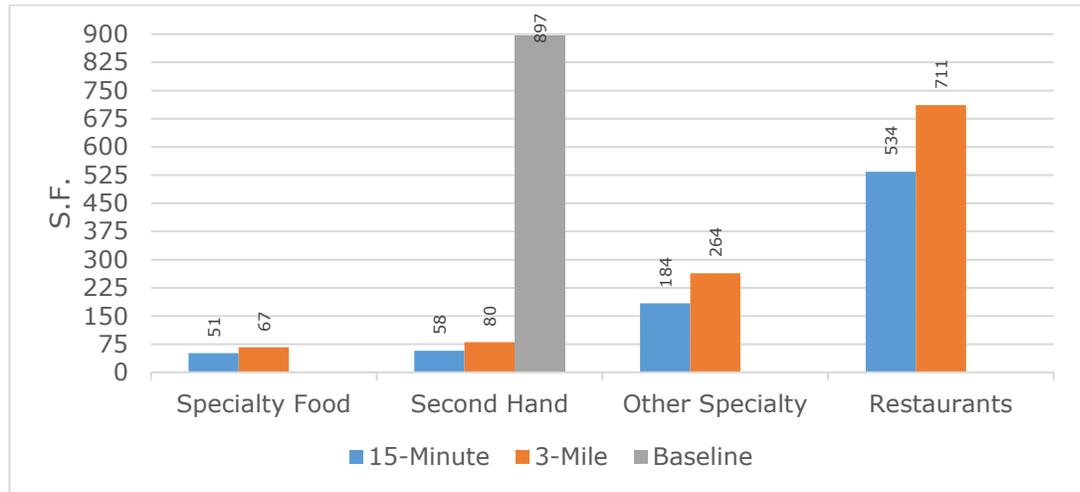
(4) includes pet supply stores, tobacco shops and generally unspecified other as examples

(5) includes full-service, limited-service, cafeterias, and snack vendors as examples

Retail Development Implications of Pipeline

Retail development implications of the pipeline housing units were considered, 334 units total, with 150 in the 3-mile radius and 184 in the 15-minute walk. These, along with the baseline estimate of 897 SF for other specialty retailers, are depicted in Figure 27. The total estimated retail development potential from all measures is 2,846 SF⁴⁸.

Figure 27 Auburn Total Estimated Potential for Retail Development - Pipeline and Baseline



Summary and Estimated Potential Economic and Fiscal Impacts

Estimated economic and fiscal impacts of a potential downtown Auburn station site (only) are summarized in Table 32, utilizing the previously established approach and methodology.

⁴⁸ Note that actual development will depend on several factors such as the availability of suitable sites, or assemblages of parcels, as well as general developer interest and financial capacities as well as possible independent market studies.

Table 32 Potential Auburn Urban Station Area - Summary of Estimated Economic / Fiscal Impacts

Summary Comparison of Potential Benefits - by Station Study Area	Auburn (Downtown)	
	Low	High
New Housing¹	59	86
Owner Units	11	19
Renter Units	48	67
Change in HH Spending in \$1,000's	\$850.5	\$1,234.5
Development Potential	5,527	
Retail SF	897	
Non-Retail SF ²	4,630	
Potential Employment³	62	
Potential Spending Demand	\$99,200	
Potential Fiscal Impacts (FY22)	Low	High
Owner Value ⁴	\$2,254.44	\$3,894.03
Renter Value ⁵	\$6,315.82	\$8,815.83
Total Residential Value \$1,000's	\$8,570.25	\$12,709.85
Estimated Gross Property Tax	\$204,143	\$302,749
Retail Value/SF	\$150	
Non-Retail Value/SF	\$225	
Total Non- Residential Value \$1,000's	\$1,176.30	
Estimated Gross Property Tax	\$28,019	

Source: Maine Revenue Services, US Census Bureau and RKG (2022)

(1) - Excludes pipeline housing and reflects change over Baseline

(2) - Excludes manufacturing

(3) - Excludes retail

(4) - Reflects an estimated average (2017-2021) building permit value/unit in \$1,000's - Androscoggin (\$204,950) and Cumberland (\$294,670) - single family homes

(5) - Reflects an estimated average (2017-2021) building permit value/unit in \$1,000's - Androscoggin (\$131,580) and Cumberland (\$120,430) - 5+multi-family homes

B

APPENDIX B: MAINE LEGISLATIVE RESOLVE (L.D. 991), CHAPTER 56

STATE OF MAINE

—
IN THE YEAR OF OUR LORD
TWO THOUSAND TWENTY-ONE

—
S.P. 317 - L.D. 991

Resolve, Directing the Department of Transportation To Conduct an Economic Evaluation Study for Commuter and Passenger Train Service between Portland and the Lewiston and Auburn Area

Sec. 1. Economic evaluation study. Resolved: That the Department of Transportation shall conduct an economic evaluation study for commuter and passenger train service between Portland and the Lewiston and Auburn area. The study must include an economic evaluation of commuter and passenger rail service that builds upon data and potential next steps included in the Lewiston-Auburn Passenger Rail Service Plan published in May 2019. The economic evaluation must incorporate 2 of the "Full Build Preferred Alignments" contained in that report as follows: "Alignment 1A" for the Pan Am Railroad corridor; and "Alignment 1B" for the state-owned St. Lawrence and Atlantic Railroad corridor from Auburn to Yarmouth Junction and connecting to the Pan Am Railroad corridor from Yarmouth Junction to Portland.

The department shall also conduct a high-level alternatives analysis for both rail corridors identified in this section to support selection of a preferred alignment and for comparison to other transportation connections between Portland and the Lewiston and Auburn area. The department shall submit a report of its findings and recommendations to the joint standing committee of the Legislature having jurisdiction over transportation matters by March 1, 2022. The joint standing committee of the Legislature having jurisdiction over transportation matters may submit a bill to the Second Regular Session of the 130th Legislature based on the findings and recommendations provided in the department's report.

Sec. 2. Funding. Resolved: That the Department of Transportation may accept funding contributions to fully fund the costs of the study under section 1. The total cost of the study may not exceed \$200,000. No funds may be collected by or transferred to the department for the purpose of conducting the study unless the department receives commitments for no less than 10% of the overall cost of the study from municipalities that would be affected by the expansion of passenger rail service between Portland and the Lewiston and Auburn area. The department may enter into agreements with the relevant municipalities for the municipalities to pay their relevant portions to fund the study in installments. If the municipalities have not fulfilled their commitment to provide 10% of

the overall costs of the study by the dates agreed upon with the department, the department may discontinue the study. If the department discontinues the study, any remaining municipal funds must be returned to the relevant municipalities and any remaining department funds appropriated for the study must be returned to the accounts from which they were appropriated.

Sec. 3. Appropriations and allocations. Resolved: That the following appropriations and allocations are made.

TRANSPORTATION, DEPARTMENT OF

Multimodal - Passenger Rail Z139

Initiative: Provides a one-time allocation for an economic evaluation study for commuter and passenger train service between Portland and the Lewiston and Auburn area. Ten percent of the cost of the study must be provided by municipalities that would be directly impacted by the train service with the remaining cost provided by existing funding within this account.

OTHER SPECIAL REVENUE FUNDS	2021-22	2022-23
All Other	\$180,000	\$0
OTHER SPECIAL REVENUE FUNDS TOTAL	<u>\$180,000</u>	<u>\$0</u>



LEWISTON-AUBURN HIGH LEVEL ALTERNATIVES ANALYSIS

Bus Alternative

January 2023

PREPARED BY



IN ASSOCIATION WITH



THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

- Introduction.....1**
- 1.1 Project History and Purpose..... 1
 - 1.1.1 2018 Lewiston-Auburn Passenger Rail Service Plan: Transit Propensity..... 2
 - 1.1.2 2019 Lewiston-Auburn Passenger Rail Service Plan: Operating Plans and Corridor Assessments..... 2
 - 1.1.3 Report Purpose..... 2
- Existing Conditons3**
- 2.1 Existing Commuter Bus Service..... 3
- Bus Connection Alternative7**
- 3.1.1 Service Plan..... 11
 - 3.1.1.1 Estimated Travel Times..... 11
 - 3.1.1.2 Operating Costs 11
- Performance Metrics Evaluated.....13**
- 4.1 Introduction 13
- 4.2 Evaluation Criteria..... 13
 - 4.2.1 Mobility Metrics 13
 - 4.2.1.1 Metric 1.1 Estimated End-to-end Travel Time From Lewiston to Portland 14
 - 4.2.1.2 Metric 1.2 Number of Transfers Required for End-to-end Trips 14
 - 4.2.1.3 Metric 1.3 Peak Frequency..... 15
 - 4.2.1.4 Metric 1.4 Off-Peak frequency 15
 - 4.2.1.5 Metric 1.5 Estimated Reliability 15
 - 4.2.1.6 Metric 1.6 Ridership Potential..... 16
 - 4.2.1.7 Metric 1.7 Transfer Location to Connect to the Downeaster to Continue to Boston..... 16
 - 4.2.2 Environmental Metrics 18
 - 4.2.2.1 Metric 2.1 Potential for Increased Air Emissions 18

4.2.2.2	Metric 2.2 Potential Impact to Impaired Water Bodies	18
4.2.2.3	Metric 2.3 Potential Impact to Non-impaired Water Bodies.....	18
4.2.2.4	Metric 2.4 Potential Environmental Justice Impacts	19
4.2.2.5	Metric 2.5 Anticipated Consultation and Permitting Effort	19
4.2.3	Cost Metrics	21
4.2.3.1	Construction Cost.....	21
4.2.3.2	Vehicle Cost	21
4.2.3.3	Metric 3.2 O&M cost	21
4.2.4	Implementation Timeframe Metric.....	23
4.2.4.1	Metric 4.1 Implementation timeframe	23
4.3	Key Takeaways.....	24
Summary		25

LIST OF TABLES

Table No.	Description	Page
Table 1	Travel Times and Distance of Potential Bus Routes	11
Table 2	Scenario 1 (4 round trips).....	12
Table 3	Scenario 2 (12 round trips)	12
Table 4	Scenario 3 (20 round trips)	12
Table 5	Mobility Metrics Evaluation	17
Table 6	Environmental Metrics Evaluation.....	20
Table 7	Cost Metrics Evaluation	22
Table 8	Implementation Timeframe Evaluation.....	23

LIST OF FIGURES

Figure No.	Description	Page
Figure 1	Existing Conditions Map.....	5
Figure 2	CityLink Bus Routes	6
Figure 3	Route B.1	8
Figure 4	Route B.2	9
Figure 5	Route B.3	10

THIS PAGE INTENTIONALLY LEFT BLANK

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 regarding 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.

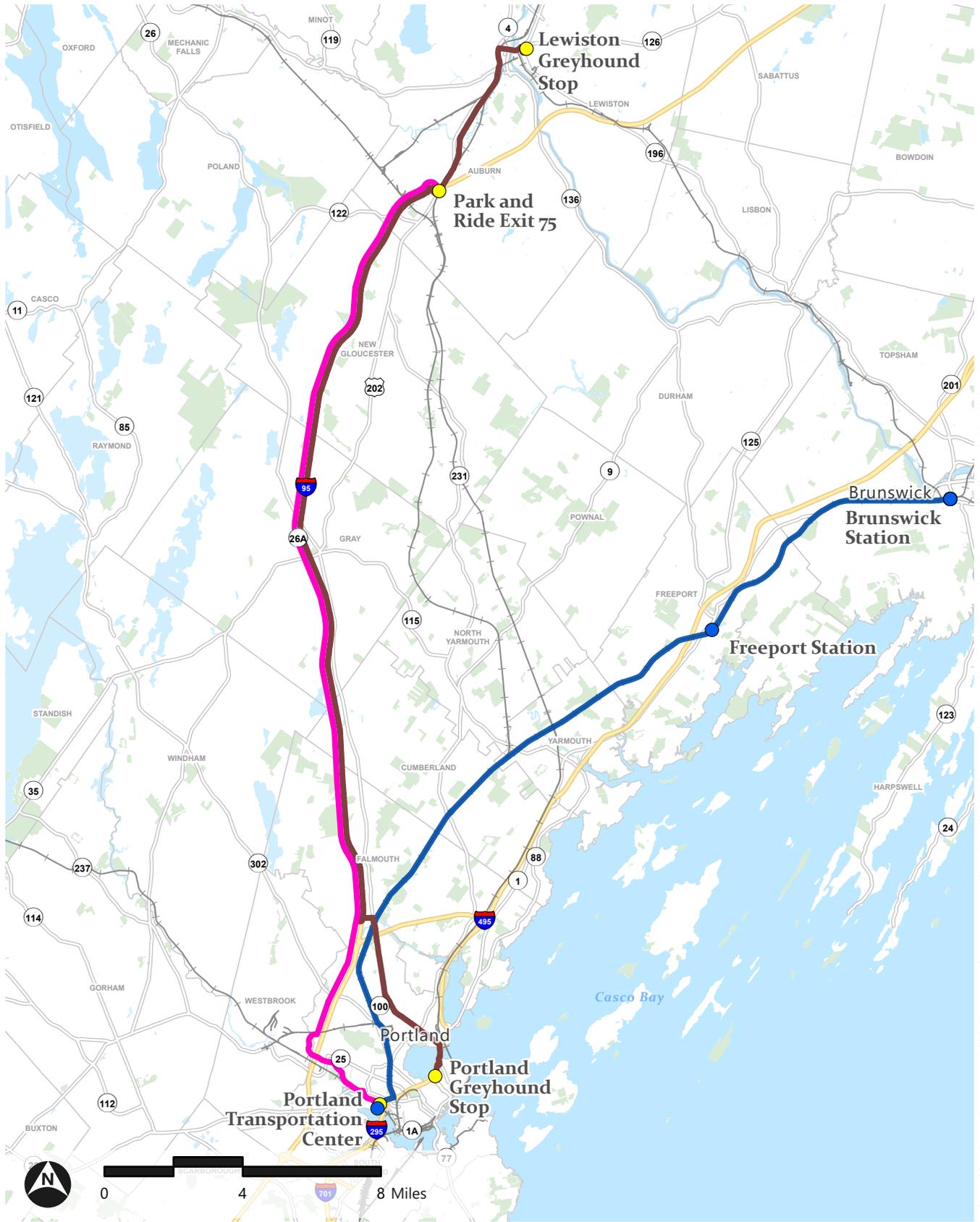
The Concord Coach Line has three existing bus stops in Lewiston and Auburn. One stop is a park and ride facility accessible from Exit 75 that provides bus service to Portland via I-95. This stop is currently the only year-round in-service Concord Coach bus stop for the area. Located in Lewiston on the 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

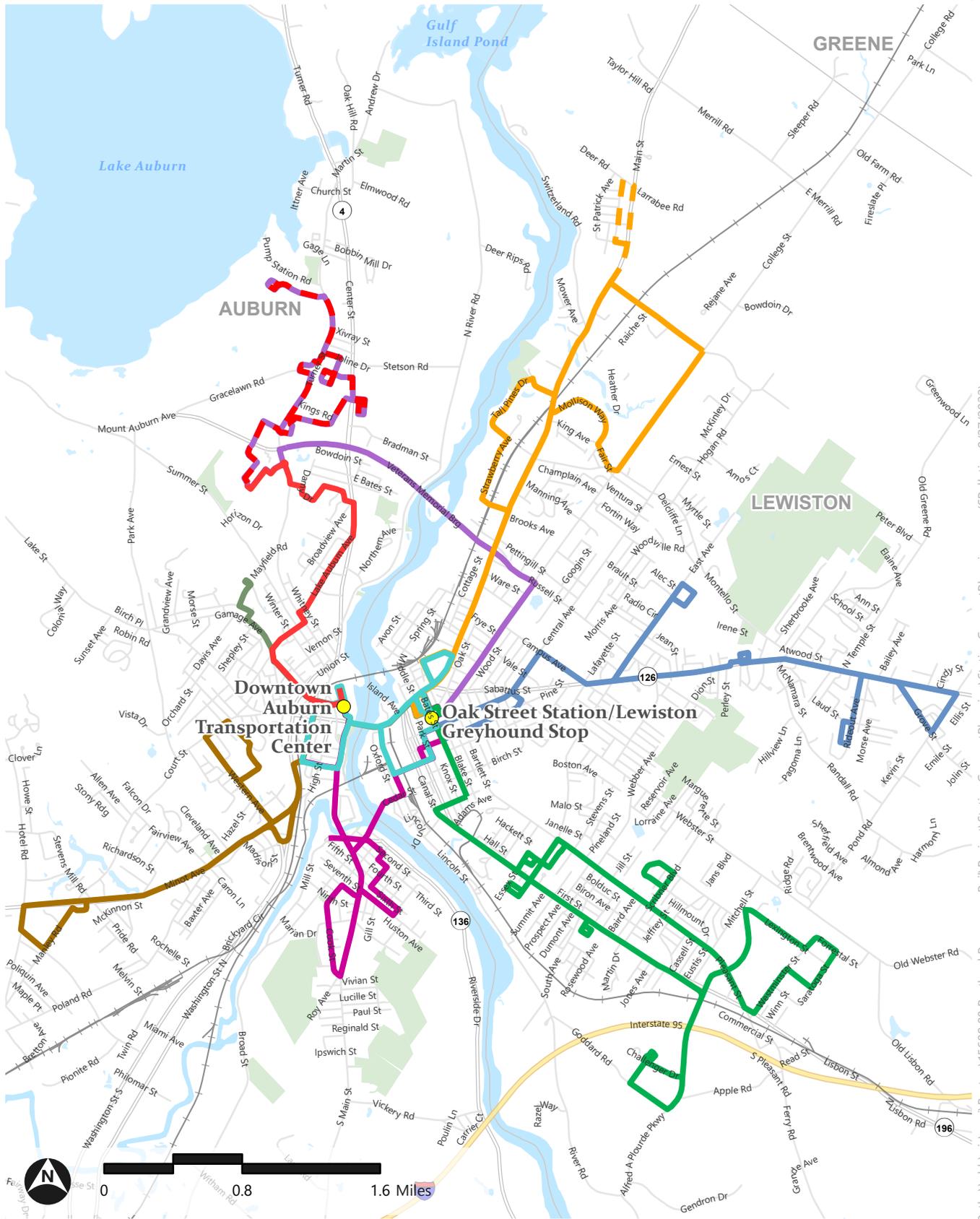


Path: \\vhb\gis\proj\Boston\15608.00 Portland Passenger Rail\Project\StationConceptPlanning\StationConceptPlanning.aprx (SPelletier, 9/27/2022)

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

Source: MEGIS

Figure 2: CityLink Bus Routes



- Bus Stop Location
- 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

Path: \\vhb\gis\proj\Boston\15608.00 Portland Passenger Rail\Project\StationConcept\StationConceptPlanning.aprx (SPelletier, 9/27/2022)

3

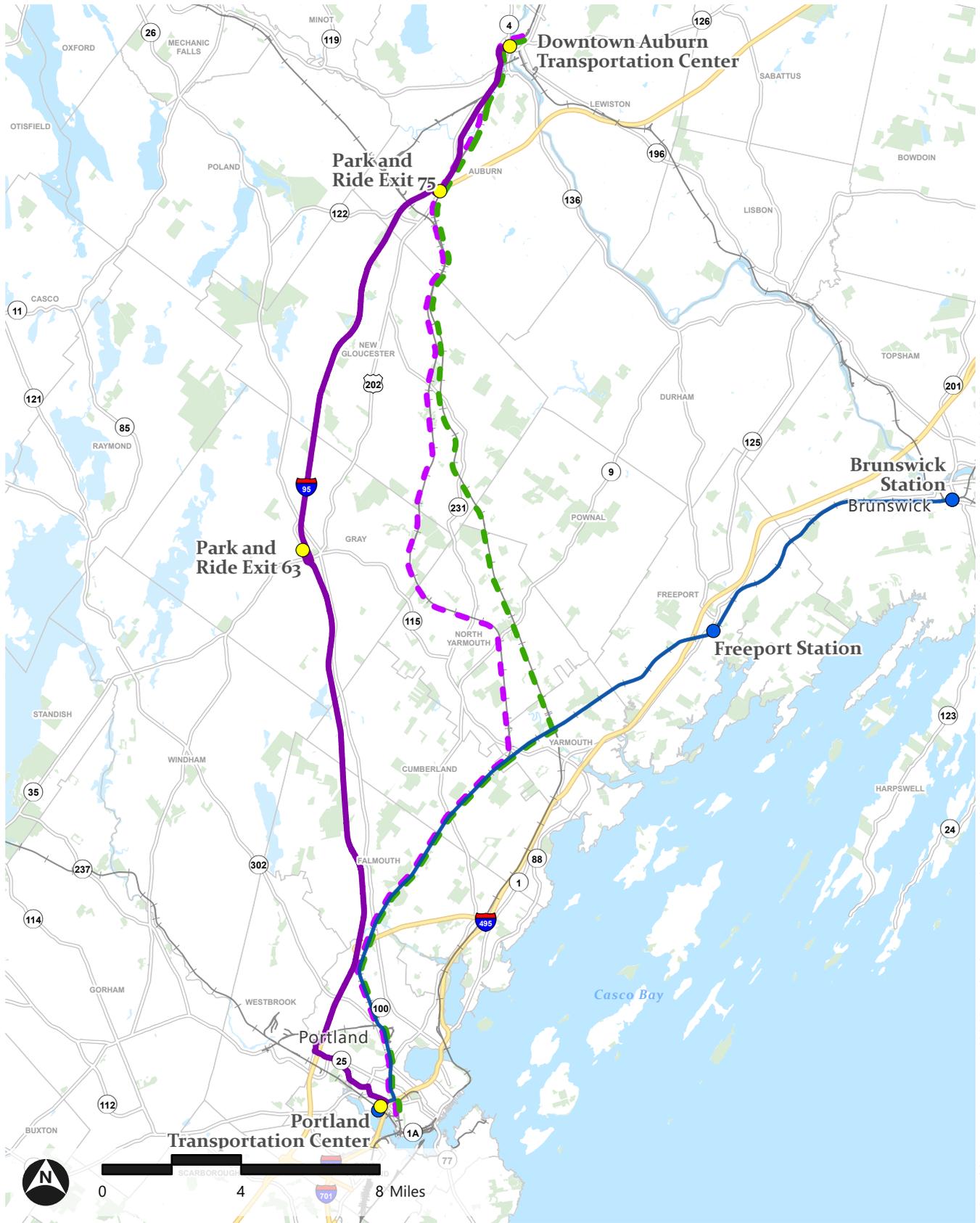
BUS CONNECTION ALTERNATIVE

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



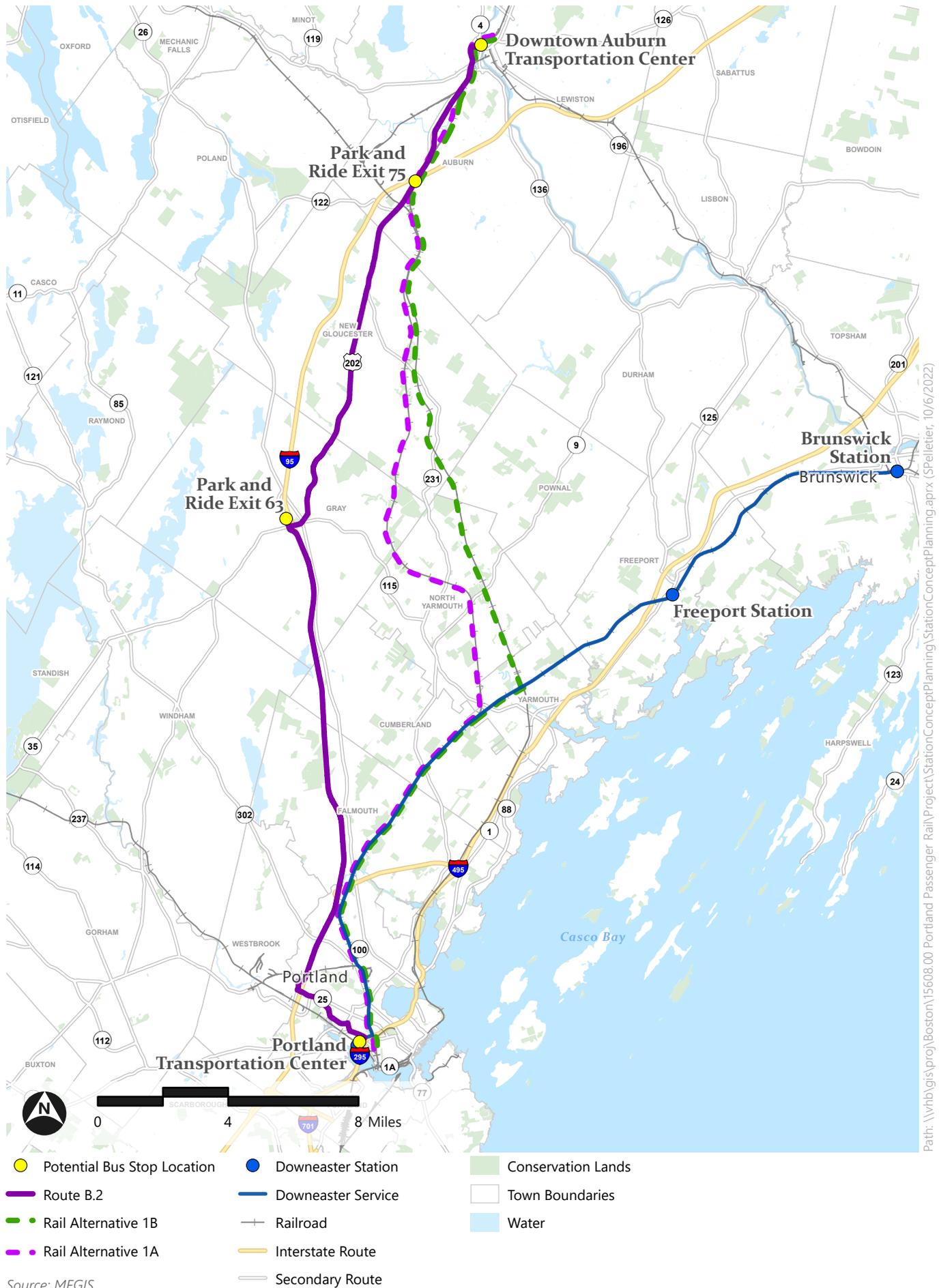
Path: \\vhb\gis\proj\Boston\15608.00 Portland Passenger Rail\Project\StationConceptPlanning\StationConceptPlanning.aprx (SPelletier, 10/6/2022)

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

Source: MEGIS



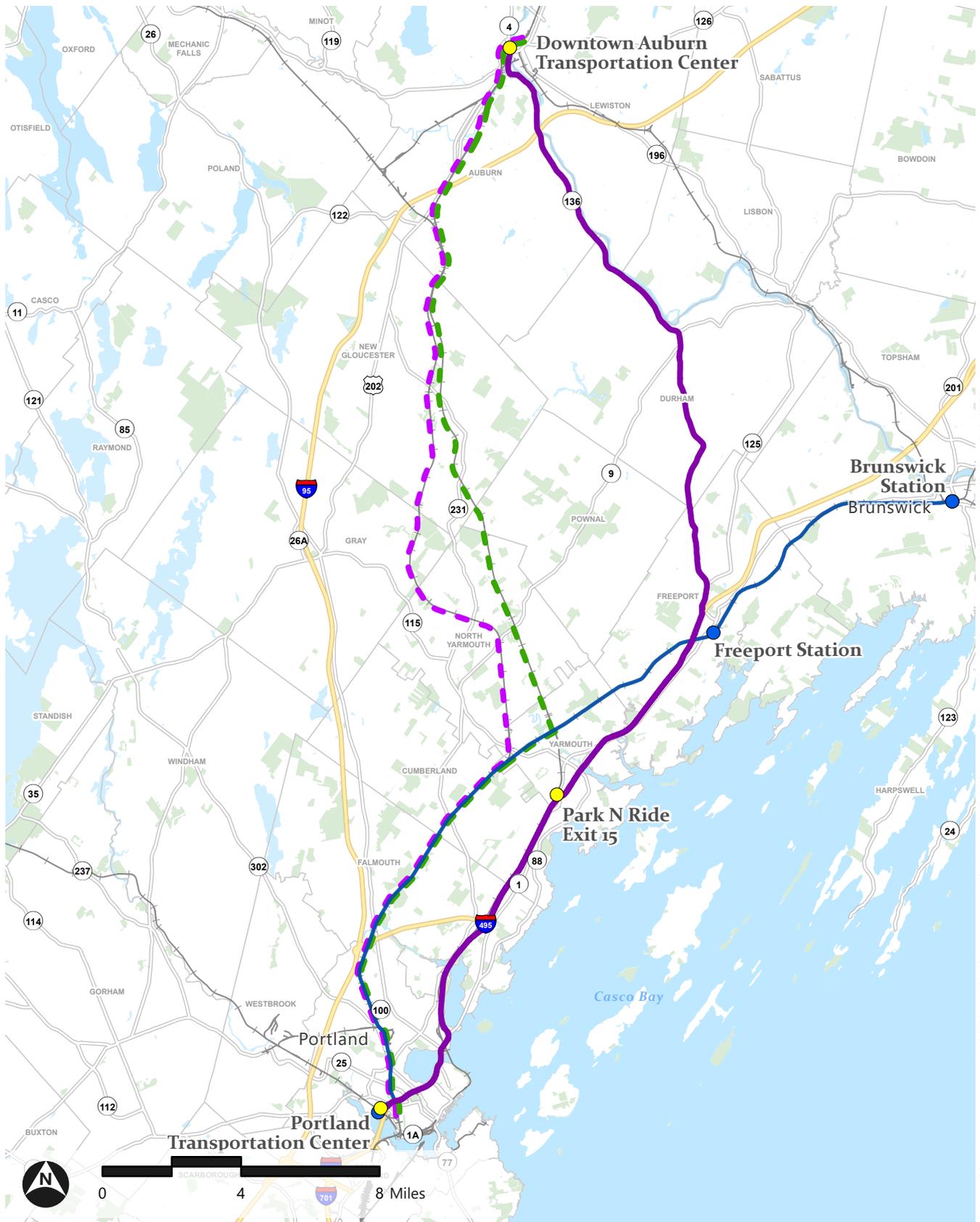
Figure 4: Route B.2



Path: \\vhb\gis\proj\Boston\15608.00 Portland Passenger Rail\Project\StationConceptPlanning\StationConceptPlanning.aprx (SPelletier, 10/6/2022)

Source: MEGIS

Figure 5: Route B.3



Path: \\vhb\gis\proj\Boston\15608.00 Portland Passenger Rail\Project\StationConceptPlanning\StationConceptPlanning.aprx (SPelletier, 10/6/2022)

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

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 representing 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 expense across the New England region per

³ National Transit Data 2020 Operating Expenses

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)

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

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 five 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

Reliable transit trips have consistent and scheduled arrival and 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 may 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	1hour	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, \$400,000. 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 Metric 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 estimated for each bus route. The proposed thresholds for evaluating O&M cost are as follows:

-

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.

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	\$1,600,000	\$1,600,000	\$1,600,000
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 represents the cost of 4 vehicles, each \$400,000.

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.



LEWISTON-AUBURN RAIL STUDY

Preliminary Capital Investment Grant Ratings Assessment

January 2023

PREPARED BY _____

IN ASSOCIATION WITH _____



THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

Introduction.....	1
Alternatives Considered	2
Capital Investment Grant Criteria Ratings Process	6
3.1 Project Justification Criteria	7
3.1.1 Mobility Improvements	8
3.1.2 Cost Effectiveness.....	8
3.1.3 Congestion Relief.....	9
3.1.4 Environmental Benefits.....	10
3.1.5 Land Use	10
3.1.6 Economic Development	11
3.1.7 Warrants	12
3.2 Local Financial Commitment	13
Lewiston-Auburn Ratings Analysis.....	15
Next Steps to Pursue Federal Funds.....	18
5.1 Project Justification Criteria Considerations	19
5.2 Local Financial Commitment Criteria Considerations.....	19

LIST OF TABLES

Table No.	Description	Page
Table 1	Mobility Improvements Breakpoints.....	8
Table 2	Cost Effectiveness Breakpoints	9
Table 3	Congestion Relief Breakpoints	9
Table 4	Environmental Benefits Breakpoints	10
Table 5	Land Use Breakpoints –Population, Employment Densities, Parking Supply	11
Table 6	Affordable Housing Breakpoints	11
Table 7	Warrants Breakpoints.....	12
Table 8	Local Financial Commitment Rating Criteria	13
Table 9	Simplified Financial Evaluation Requirements.....	14
Table 10	CIG Ratings Summary.....	16

LIST OF FIGURES

Figure No.	Description	Page
Figure 1	Alternative 1A.....	4
Figure 2	Alternative 1B.....	5
Figure 3	New and Small Starts Project Evaluation and Rating	7

1

INTRODUCTION

MaineDOT is currently leading the Lewiston-Auburn Rail Economic Evaluation Study, as directed by LD 991 passed by the Maine legislature reviewing the feasibility of creating passenger rail service between Lewiston-Auburn and Portland, ME.

The Lewiston-Auburn Passenger Rail Service Plan Project has included a series of reports: the *Transit Propensity Analysis Report* (August 2018), *Operating Plans and Corridor Assessments* (May 2019), and *Economic Evaluation Study* (January 2023).

This document will detail the various alignment alternatives that were considered throughout the course of the study. Next, the Capital Investment Grant (CIG) evaluation rating process will be described, followed by the results of a preliminary CIG assessment for the Lewiston-Auburn Rail alternatives.

2

ALTERNATIVES CONSIDERED

Throughout the course of previous MaineDOT's studies for this project, a series of alignment alternatives were identified. Initiated with the *Transit Propensity Analysis Report* (August 2018) and refined within the *Operating Plans and Corridor Assessments* (May 2019), a long list of alignments was initially considered.

The alternatives analyzed as part of the studies included the following alignments, all connecting in Portland's East End or West End:

- ▶ Alignment 1A - High-Frequency Service between Lewiston-Auburn and Portland using PAR Corridor
- ▶ Alignment 1B - High-Frequency Service between Lewiston-Auburn and Portland using SLR to Yarmouth Junction
- ▶ Alignment 2A - High-Frequency Service between Lewiston-Auburn and Portland via Back Cove Bridge using Pan Am Corridor through Royal Junction
- ▶ Alignment 2B - High-Frequency Service between Lewiston-Auburn and Portland via Back Cove Bridge using SLR Corridor
- ▶ Alignment 3A - Split Brunswick-bound Downeaster Service between Lewiston-Auburn and Brunswick using Pan Am Corridor
- ▶ Alignment 3B - Split Brunswick-bound Downeaster Service between Lewiston-Auburn

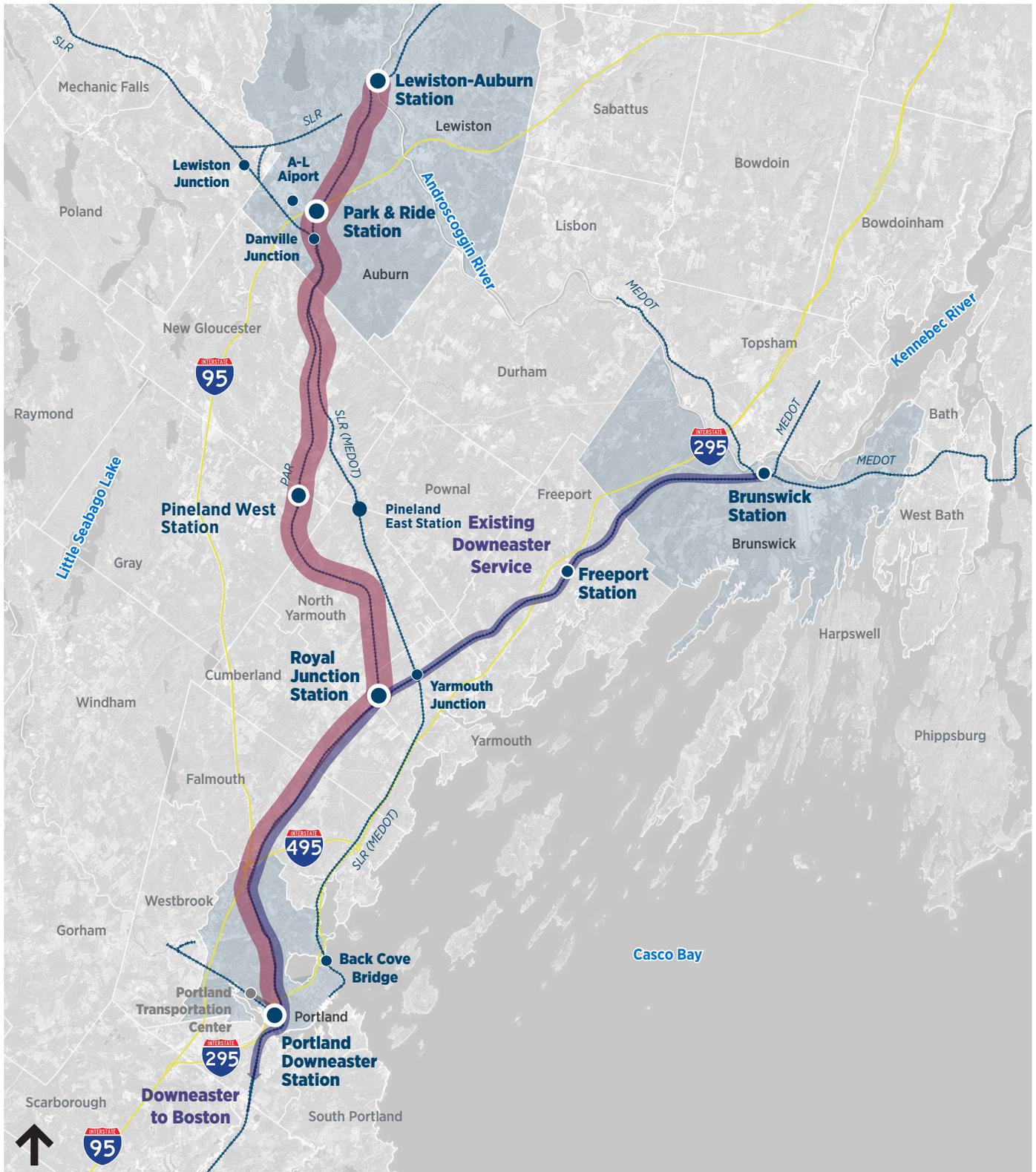
and Brunswick using SLR Corridor

- ▶ Alignment 4 - Rail Shuttle Connecting Lewiston-Auburn to Downeaster at Yarmouth Junction using SLR Corridor
- ▶ Alignment 5 - Rail Shuttle Connecting Lewiston-Auburn to Downeaster at Royal Junction using Pan Am Corridor

Starting with a long list of potential alignments, two were selected as part of LD 991 as the preferred alternatives under consideration for further analysis in the study, *Operating Plans and Corridor Assessments* (May 2019) by Maine DOT. Figures 1 and 2 illustrate the two preferred alignments under consideration. Both of these alternatives selected terminate in Portland, ME:

- ▶ **Alignment 1A (West)** is the western route for the proposed rail services with the following station areas - Lewiston, Auburn (Park and Ride), and Pineland West.
- ▶ **Alignment 1B (East)** is the eastern route for the proposed rail services with the following station areas - Lewiston, Auburn (Park and Ride), Pineland East, and Yarmouth Junction.

Alignment 1A and Alignment 1B's have relatively similar track lengths. Alignment 1A is approximately 35.9 miles long and uses the PAR freight mainline. Alignment 1B is approximately 36.3 miles long and uses the PAR freight mainline before switching to the SLR line at the Yarmouth Junction. Both Alignments service similar areas and provide service daily from 5:00 AM to 10:30 PM. No specific station sites have been identified for both Alignments.



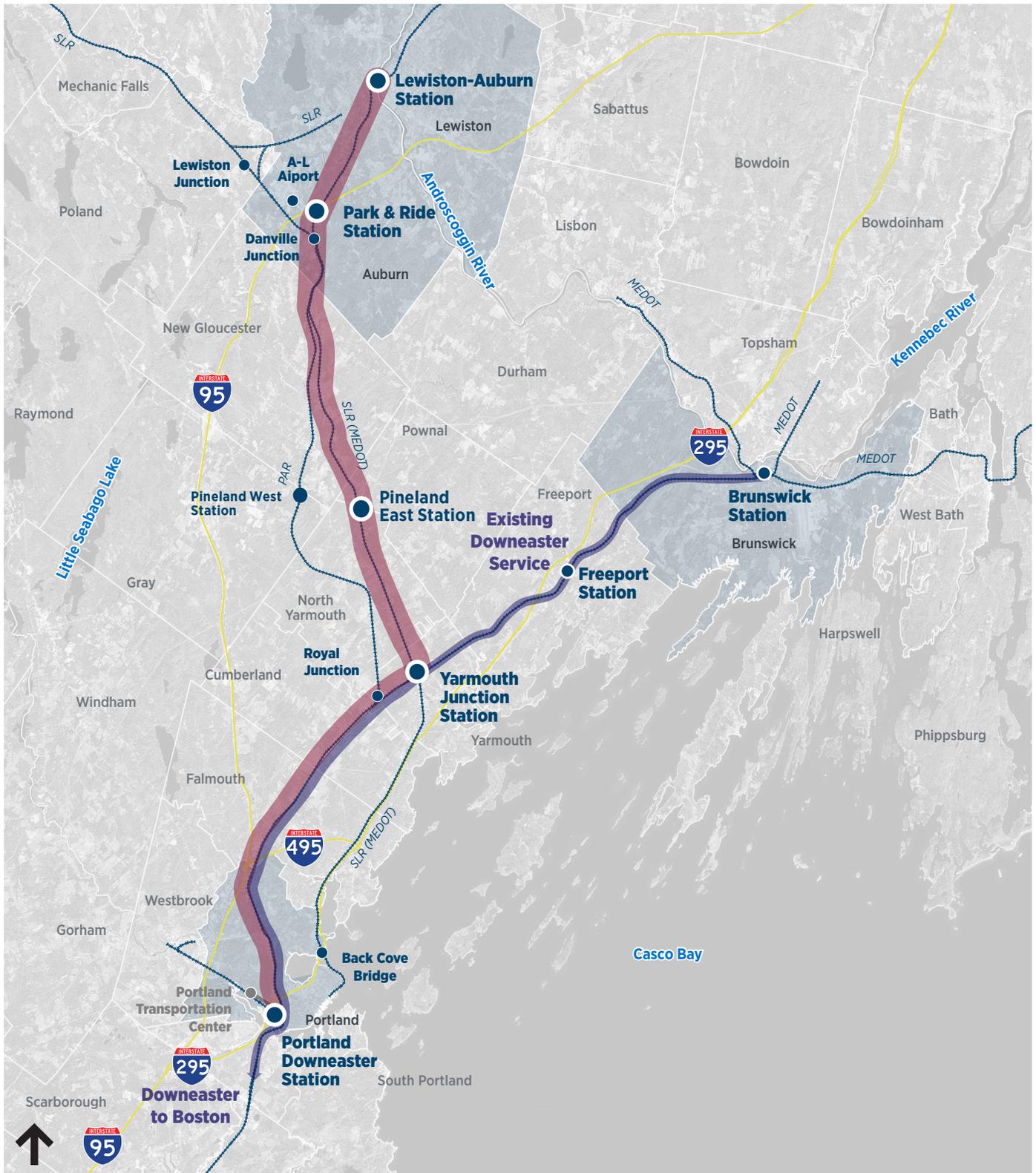
\\whb\gbl\proj\Boston\14093\00\tech\Task 11 - LA Passenger Rail Report\Figures\Alignments\Figures_v2.indd



- Existing Downeaster Service
- Proposed Alignment
- Existing Downeaster Station
- Potential Stations

LEWISTON-AUBURN CAPITAL INVESTMENT GRANT ASSESSMENT

Alignment 1A Route Map with Potential Stations



\\whb\gbl\proj\Boston\14093.00\tech\Task 11 - LA Passenger Rail Report\Figures\Alignments\Figures_v2.indd

- Existing Downeaster Service
- Proposed Alignment
- Existing Downeaster Station
- Potential Stations

LEWISTON-AUBURN CAPITAL INVESTMENT GRANT ASSESSMENT

Alignment 1B Route Map with Potential Stations

3

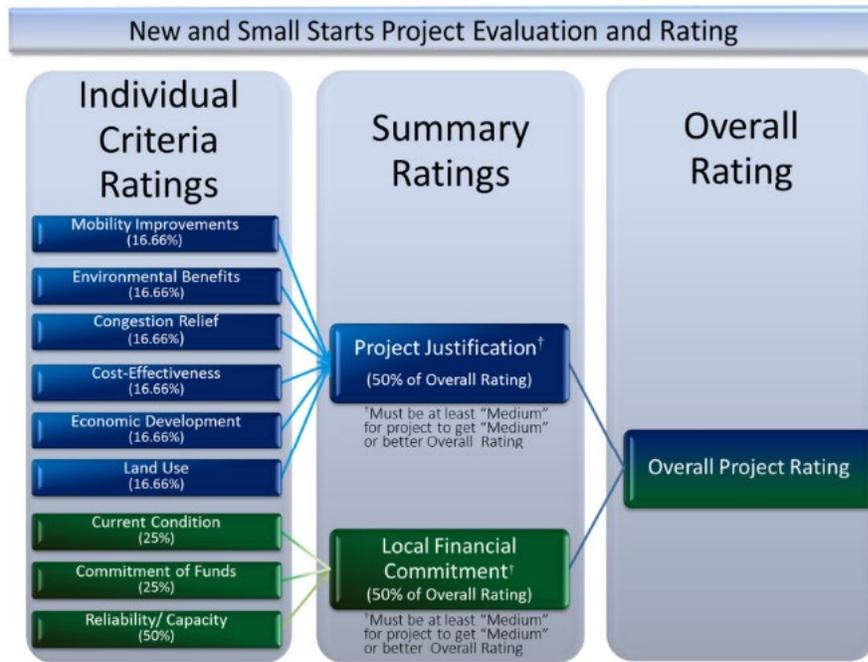
CAPITAL INVESTMENT GRANT CRITERIA RATINGS PROCESS

Projects undergoing CIG application will be evaluated by the FTA on a 5-point scale from low to high based on based on a combined summary of project justification criteria and local financial commitment.

The Project Justification contributes 50% toward the Overall Project Rating. Each of the six Project Justifications are given an equal weight of 16.66%. The Local Financial Commitment contributes the remaining 50% toward the Overall Project Rating. The three criteria of Local Financial Commitment are weighted at 25%, 25% and 50%.

The FTA requires a medium rating or above on both Project Justification and Local Financial Commitment to obtain an Overall Project Rating of medium or better. The chart in Figure 3 describes the CIG criteria rating process and how each project justification is weighted.

Figure 3 New and Small Starts Project Evaluation and Rating



Graphic Source: [FTA Capital Investment Grants Policy Guidance Jan 2023](#)

3.1 Project Justification Criteria

There are six justification criteria - mobility improvements, environmental benefits, congestion relief, economic development effects, land-use, and cost-effectiveness - used to rate projects applying for a Capital Improvement Grant. Projects are rated and evaluated against the criteria established by the FTA. Breakpoints have been established by the FTA to help rate each justification criteria against the project. The following section details the methodology for calculating each justification criteria set forth by the FTA.

3.1.1 Mobility Improvements

The FTA evaluates mobility improvements as the total number of linked trips using proposed service, with transit dependent trips weighted double. Projects can choose to estimate total linked trips either by a local travel forecasting model or FTA’s simplified model (STOPS) which uses existing census and ridership data.¹ FTA’s mobility metric is computed by adding the estimated number of linked trips taken by non-dependent transit persons and the number of linked trips taken by transit dependent persons multiplied by two. The table below shows FTA’s break points for mobility metrics. Data on transit-dependent riders is not currently available for this study. This calculation weighs each rider equally.

Table 1 Mobility Improvements Breakpoints

Rating	Mobility Improvements: Estimated Annual Trips (Trips by Non-Transit Dependent Persons plus Trips by Transit Dependent Persons multiplied by 2)
High	>= 30 Million
Medium-High	15 Million – 29.9 Million
Medium	5 Million – 14.9 Million
Medium-Low	2.5 Million – 4.9 Million
Low	<2.5 Million

Lewiston Auburn’s Passenger Rail Service baseline mobility calculation for both Alignments is rated as low with an estimated 477,420 annual trips. The 2040 mobility calculation for both alignments is also rated low with 581,263 annual trips.

3.1.2 Cost Effectiveness

The cost-effectiveness metric is based on a cost per trip measure, meaning the annualized capital cost and annualized operating and maintenance (O&M) cost. This metric is an incremental measure requiring a point of comparison. Current year calculations are compared to existing transit system, 10-year horizon forecasts are compared to the no build scenario, and 20-year horizon forecasts are compared to the Metropolitan Planning Organization’s fiscally constrained long-range plan.² This Passenger Rail Service plan will be compared to a 2040 scenario.

Cost-effectiveness is calculated by adding the annualized capital cost and annualized O&M cost and dividing that by the annual number of forecasted trips. The table below shows FTA’s breakpoints for cost-effectiveness. Annualized capital cost is calculated using FTA’s

¹ Refer to Chapter 6 in the 2018 Lewiston Auburn Passenger Rail Service Transit Propensity Report for information on ridership methodology. <https://www.avcog.org/DocumentCenter/View/4521/L-A-Passenger-Rail-Service-Plan-Transit-Propensity-Report-August-2018-PDF>

² Capital cost and annualized O&M costs were calculated in 2019. A 1.116% inflation rate has been applied to each of these estimates.

Standard Cost Categories (SCC). The necessary data to compute this cost is unavailable at this time, so an annualization rate of 4.46% for capital cost was assumed.³

Table 2 Cost Effectiveness Breakpoints

Rating	Range
High	<\$1.00
Medium-High	Between \$1.01 and \$1.99
Medium	Between \$2.00 and \$3.99
Medium-Low	Between \$4.00 and \$5.00
Low	>\$5.00

Lewiston Auburn’s Passenger Rail Service baseline and 2040 cost effectiveness metric for both alignments are rated as low. Alignment 1A baseline cost effectiveness was estimated to be \$78.30 and the 2040 estimate is \$64.31. Alignment 1B baseline cost effectiveness was estimated to be \$83.14 and the 2040 estimate is \$68.28.

It is important to note that these ranges consider all transit modes: heavy rail, light rail, BRT, commuter rail, some of which are generally more cost effective than commuter rail, due to the high capital costs of this mode.

3.1.3 Congestion Relief

The congestion relief metric is based on the number of new weekday linked trips resulting from the implementation of the project. This metric is calculated by comparing total weekday linked transit trips for the no-build alternative with the total weekday linked transit trips.

Table 3 Congestion Relief Breakpoints

Rating	New Weekday Linked Transit Trips
High	18,000 and above
Medium-High	10,000 to 17,999
Medium	2,500 to 9,999
Medium-Low	500 to 2,499
Low	0 to 499

Daily transit trips for baseline Alignment 1A and 1B is estimated to be 1,300, with an estimated 6,500 weekday linked transit trips. Daily transit trips for Alignment 1A and 1B in 2040 is estimated to be 1,300, with an estimated 8,000 weekday linked transit trips. The No Build for the Project would induce 0 weekday transit trips. **Lewiston Auburn’s**

³ A 4.46% annualization rate is the average annualization rate from the FTA’s Standard Cost Categories (SCC).

Passenger Rail Service baseline and 2040 congestion relief metric for both alignments would be rated as medium.

3.1.4 Environmental Benefits

The environmental benefits metric is based upon a dollar value of anticipated direct and indirect benefits to human health, safety, energy, and air quality. This dollar value is then compared to the same annualized capital and O&M costs found in the cost-effectiveness metric. Benefits are computed based on the change in vehicle miles travelled (VMT). Each subfactor (human health, safety, energy, and air quality) converts the VMT back to its native unit to compute a dollar value for each benefit. The conversion is done by using national-level standards provided by the FTA.⁴ The table below shows the FTA’s breakpoints for environmental benefits.

Table 4 Environmental Benefits Breakpoints

Rating	Range
High	>10%
Medium-High	5 to 10%
Medium	0 to 5%
Low-Medium	0 to -10%
Low	< -10%

Alignment 1A baseline percentage was calculated at -17% and 2040 percentage at -21%. **Alignment 1A is rated as low** for both baseline and horizon. Alignment 1B baseline percentage was calculated to be -15% and 2040 percentage to be -18%. **Alignment 1B is rated as low** for baseline and horizon calculations.

3.1.5 Land Use

The land use metric is a quantitative metric that analyzes existing corridor conditions. These existing conditions include station area development, station area pedestrian facilities, station area parking supply, and the proportion of existing “legally binding affordability restricted housing” within a half mile of the station area compared to existing “legally binding affordability restricted housing” in counties the project travels through. This metric is measured through station area population densities, total employment served by the project, and proportion of “legally binding affordability restricted housing” in half mile area of the station. The table below shows FTA’s breakpoints for area population, employment densities, and parking supply.

⁴ Conversion standards can be found in the Capital Investment Grants Policy Guidance, Federal Transit Administration, January 2023 [final Initial CIG Policy Guidance January 2023 \(dot.gov\)](#)

Table 5 Land Use Breakpoints –Population, Employment Densities, Parking Supply

Rating	Station Area Development		Parking Supply	
	Employment served by system	Avg. Population density (persons/sq. mi.)	CBD typical cost per day	CBD spaces per employee
High	> 220,000	>15,000	>\$16	<0.2
Medium-High	140,000 – 219,999	9,600 – 15,000	\$12 - \$16	0.2 – 0.3
Medium	70,000 – 139,999	5,760 – 9,599	\$8 - \$12	0.3 – 0.4
Medium-Low	40,000 – 69,999	2,561 – 5,759	\$4 - \$8	0.4 – 0.5
Low	<40,000	<2,560	<\$4	>0.5

The following table shows the breakpoints for the proportion of legally binding affordability restricted housing in the project corridor.

Table 6 Affordable Housing Breakpoints

Rating	Proportion of legally binding affordability restricted housing in the project corridor compared to the proportion in the counties through which the project travels
High	>= 2.50
Medium-High	2.25 – 2.49
Medium	1.50 – 2.24
Medium-Low	1.10 – 1.49
Low	<1.10

Available data on transit corridor’s employment density and population density is measured in a 3-mile radius around each proposed station.⁵ To compute the land use metric, the FTA defines the transit corridor as ½ mile around each proposed station. Because the rail corridor travels through an area with relatively low population density and data needed to complete this calculation is unavailable at this time, **it assumed the land use metric is rated as Low.**

3.1.6 Economic Development

Economic development is a qualitative metric measuring the extent the proposed project is likely to induce transit-supportive development. This metric is evaluated using transit supportive plans and policies. At this stage of the project, no conceptual station plans have been developed, and there is limited documentation on transit supportive plans and policies. The 2022 *Lewiston Auburn Study for Economic Evaluation Study* discusses at a

⁵ Refer to the 2022 Lewiston Auburn Rail Study Economic Evaluation Study for information on employment and population density.

high level potential economic development from the proposed rail service. **Though this study discusses potential future development along the corridor, this project is not far enough along in the design process to calculate the economic development metric.** As the project advances into conceptual design, the economic development metric will be considered in future analysis.

3.1.7 Warrants

Warrants are a pre-qualification approach that allows a proposed project to automatically receive a Medium rating on the Mobility Improvements, Congestion Relief, and Cost-Effectiveness. Warrants require project sponsors to submit a letter addressed to the FTA Associate Administrator for Planning and Environment requesting approval for use of warrants. The letter must document estimated project cost, requested CIG amount and share, and the existing transit ridership in project corridor. The letter must also include demonstration the transit system is currently in a state of good repair. Warrants aim to streamline the CIG process and reduce analysis time. The following table demonstrates the breakpoints for each criterion. **Because Lewiston Auburn Passenger Rail Service is a new service and not an improvement of an existing system, this project does not qualify to use warrants.**

Table 7 Warrants Breakpoints

Total Proposed Small Starts Project Capital Cost (millions)	Existing Weekday Transit Trips in the Corridor	Mobility Rating Automatically Assigned	Cost Effectiveness Rating Automatically Assigned	Congestion Relief Rating Automatically Assigned
Combination of both metrics				
\$0 to <\$50	3,000 or more	Medium	Medium	Medium
\$50 to <\$100	6,000 or more	Medium	Medium	Medium
\$100 to <\$175	9,000 or more	Medium	Medium	Medium
\$175 to <\$250	12,000 or more	Medium	Medium	Medium

3.2 Local Financial Commitment

Local Financial Commitment Rating for proposed New Starts projects is calculated by the FTA based on three criteria. Ratings range from High, Medium-High, Medium, Medium-Low, and Low.⁶ This rating makes up 50% of the Overall Rating. **A project must have at least a “Medium” rating in order to achieve a “Medium” or better Overall Rating.**

The rating is measured as a weighted average of the following criteria areas:

Table 8 Local Financial Commitment Rating Criteria

Local Financial Commitment Rating	
Criteria Category	Weighted
Current Condition (Capital and Operating)	25%
Commitment of Funds (Capital and Operating)	25%
Reasonableness of Assumptions and Financial Capacity (Capital and Operating)	50%

The project’s summary local financial commitment rating may be raised by one level if it is rated at least at a Medium and the project sponsor provides more than 50% of the project’s capital cost. This would assume that the requested CIG share is less than 50%.

Current Condition takes into account average fleet age, bond ratings within the last two years, current ratio, and recent service history. **Commitment of Funds** considers amount of committed, budgeted, or planned funds, and whether there are significant private contributions to the project. **Reasonableness of Assumptions and Financial Capacity** accounts for assumptions about revenue and expense growth, reasonableness of project capital cost estimate, state of good repair needs, and the capacity to withstand cost overruns or funding shortfalls.

In order to assess financial readiness, the FTA requires that the project sponsor for a proposed New Starts project prepare a financial plan and 20-year cash flow statement per the *FTA’s Guidance for Transit Financial Plans*.⁷

Currently, there are no local financial commitments demonstrated for the Lewiston-Auburn Passenger Rail Service. **The estimated rating for this project would be Low, primarily based on the lack of existing local financial commitment, although some of the other metrics cannot currently be evaluated based on availability and or presence of data.**

⁶ Detailed metrics for criteria and ratings can be found on page 39, Ch.2 Small Starts, in the Capital Investment Grants Policy Guidance Federal Transit Administration January 2023 [final.Initial CIG Policy Guidance January 2023 \(dot.gov\)](https://www.federaltransit.gov/sites/default/files/2023-01/final_initial_cig_policy_guidance_january_2023_dot.gov)

⁷ [Guidance for Transit Financial Plans \(dot.gov\)](https://www.federaltransit.gov/sites/default/files/2023-01/guidance_for_transit_financial_plans_dot.gov)

It is expected that the rating could be improved, and that a given project could qualify for a Simplified Financial Evaluation if project sponsors meet the following requirements:

- ▶ Reasonable plan to secure funding for the local share
- ▶ O&M cost of the project is <5% of existing operating budget
- ▶ Sponsor is in reasonably good financial condition

Table 9 Simplified Financial Evaluation Requirements

Simplified Financial Evaluation - Requirements	
Project Sponsor Actions	Ranking
Meets requirements above & requests >50% Small Starts funding	Automatic "Medium"
Meets requirements above & requests <50% Small Starts funding	Automatic "High"
Cannot meet requirements above	Cash flow must be submitted and project is evaluated in fashion similar to New Starts

In sum, the local financial commitment rating takes into account:

- ▶ Qualifies for Simplified Financial Evaluation
- ▶ Current Financial Condition (Capital & Operating)
- ▶ Commitment of Funds (Capital & Operating)
- ▶ Reasonableness of Assumptions & Financial Capacity (Capital & Operating)
- ▶ Estimated CIG Funding Request
- ▶ All other funding sources
- ▶ Project Development Estimated Cost
- ▶ CIG Share of Capital Cost
- ▶ Federal Share of Capital Cost

4

LEWISTON-AUBURN RATINGS ANALYSIS

FTA CIG templates were completed to estimate CIG project eligibility for each of the final two alternatives based on work that has been completed to date. Table 10 summarizes the estimated CIG ratings analysis for both project alternatives.

The FTA does not assign numerical scores for each category, but determines the overall Project Justification Score and Local Financial Commitment Score using the category ratings of each criteria.

With available data, the Lewiston-Auburn Passenger Rail Project would score Low for Project Justification. Of the six criteria for Project Justification, only one has a Medium score. For the Project Justification Score to equal the minimum “Medium” at least four of the categories must be medium if all others receive a low score since all criteria are equally weighted. Alternatives include receiving warrants for certain project justification criteria that would allow the project to move forward with potentially lower scores. Warrants allow for automatic ratings on project justification criteria in certain cases.

Table 10 CIG Ratings Summary

Project Description	1A	1B
Project Type	Commuter Rail Service	Commuter Rail Service
Length (miles)	35.9	36.3
Mode/Technology	Locomotives	Locomotives
Number of Stations	4	4
Number of Vehicles	15	15
Current Year	2022	2022
Horizon	20 years	20 years
Exact Horizon Year	2040	2040
Existing Weekday Corridor Ridership	N/A	N/A
Capital Cost (Current Year \$)	\$230,000,000	\$254,000,000
Capital Cost (Year of Expenditure #)	N/A	N/A
Annualization Factor	N/A	N/A
Warrants Eligible?	N/A	N/A

Project Justification (50% of Overall Project Rating)

Project Description	1A		1B	
	2022	2040	2022	2040
Mobility Improvements				
Annual Trips	477,420	581,263	477,420	581,263
<i>Mobility Improvement Rating</i>	Low	Low	Low	Low
Cost Effectiveness				
Capital Cost ⁸	\$16,176,000	\$16,176,000	\$17,371,000	\$17,371,000
Annualized Operations & Maintenance Cost	\$21,204,000	\$21,204,000	\$22,320,000	\$22,320,000
<i>Cost Effectiveness Rating</i>	Low	Low	Low	Low
Congestion Relief				
<i>Congestion Relief Rating</i>	Medium	Medium	Medium	Medium

⁸ FTA's Cost Effectiveness calculation requires an annualized capital cost, this analysis assumed a 4.46% annualization rate.

Project Justification – Continued (50% of Overall Project Rating)

Project Description	1A		1B	
	2022	2040	2022	2040
Environmental Benefits				
Change in Vehicle Miles Traveled (VMT)	-2,387,100	-2,906,313	-2,196,132	-2,673,808
Environmental Benefit (%)	17%	21%	15%	18%
<i>Environmental Benefits Rating</i>	Low	Low	Low	Low
Land Use (Current Year)				
<i>Land Use Rating</i>	Low	Low	Low	Low
Economic Development				
<i>Economic Development Rating</i>	N/A	N/A	N/A	N/A

The FTA requires a medium rating or above on both Project Justification and Local Financial Commitment categories to obtain an Overall Project Rating of medium or better.

5

NEXT STEPS TO PURSUE FEDERAL FUNDS

The Lewiston-Auburn project does not appear eligible for CIG funding in its current status for Project Justification.

In order to be considered eligible for CIG funding by the FTA, Maine DOT may wish to consider the following updates to shift ratings from low to medium, or higher, in order to achieve a higher overall score.

In general, it is acceptable if some criteria ratings are low, as long as that is offset with medium or medium-high ratings in other criteria areas. MaineDOT should focus on improving the criteria categories where it is feasible to do so. Since one category, Congestion Relief, is already estimated to have a medium rating, improvements in other areas or qualification for warrants may raise other scores and the overall rating. Elements to analyze further are noted in the following section.

It is also important to note that early FTA engagement is vital in the Capital Investment Grant process. Communicating efficiently first with the regional office, then FTA Headquarters, will lead to a better understanding of the administration's priorities and process. Having a Congressional Champion for the project also fosters success.

For the project to formally enter project development and conduct the analysis for CIG scoring, the project needs to have funds identified. While federal CIG funds cannot be used for project development, local funds used during this phase of the project can later be applied as a local match for federal funds. As long as the project cost remains within

the Small Starts threshold, many tasks can be completed throughout the Project Development phase to improve the project ranking. This is in contrast to a two year project development phase that applies to projects which fall within the New Starts category.

Once the Lewiston-Auburn project has been developed further, the CIG Rating Analysis should be revised reflecting any changes that would further justify the project in the project development phase.

5.1 Project Justification Criteria Considerations

- ▶ Mobility Improvements – estimated low rating
 - As noted in section 3.1.1, data on transit-dependent riders is not currently available for this study.
 - Acquiring and sharing the data on transit-dependent ridership may help to improve the Mobility Improvements metric rating from low to medium.
- ▶ Cost Effectiveness – sufficient data not currently available
 - Areas or strategies to improve this ranking may be considered in the Project Development phase.
- ▶ Environmental Benefits – estimated low rating
 - Areas or strategies to improve this ranking may be considered in the Project Development phase.
- ▶ Land Use – estimated low rating
 - As noted in Section 3.1.5, it assumed the Land Use metric is rated as Low, since the rail corridor travels through an area with relatively low population density, and data needed to complete this calculation is unavailable at this time.
 - Providing more data and any updates to land use policy in the form of zoning updates, updated local ordinances, master plans, or transit oriented development plans may help improve the Land Use metric from a low to medium rating.
- ▶ Economic Development – sufficient data not currently available
 - Areas or strategies to improve this ranking may be considered in the Project Development phase.

5.2 Local Financial Commitment Criteria Considerations

- ▶ Local Financial Commitment
 - As noted in section 3.2, the estimated rating for this category would be Low, primarily based on the lack of existing local financial commitment, although some of the other metrics cannot currently be evaluated based on availability and or presence of data.
 - The FTA requires a minimum of a 50% or higher local financial commitment. The higher the local financial commitment share above 50%, the higher the rating is likely to be for this category.