LEWISTON-AUBURN PASSENGER RAIL SERVICE PLAN

Transit Propensity Report

May 2018

PREPARED BY

vhb wsp

IN ASSOCIATION WITH

NORTHERN NEW ENGLAND PASSENGER RAIL AUTHORITY MaineDOT

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INTRODUCTION

1.1 Overview of this Project

In its 16 years, the Downeaster passenger rail service has just about doubled its ridership base (approximately 290,000 riders in 2002 to roughly 541,000 in 2017) demonstrating a growing trend for travel beyond automobile reliance. This service has improved connectivity and provided an additional reliable public transportation option in northern New England.

The shift to passenger rail use has provided a balanced demand on redundant transportation infrastructure, which helps distribute the previously singularly focused investment into transportation infrastructure beyond the regional highway systems. Furthermore, transit connections provide additional flexibility and options for the traveling public.

To support this and other transportation initiatives, the Northern New England Passenger Rail Authority (NNEPRA) has successfully advanced several rail initiatives, including construction of passing sidings in Dover, the Portland to Brunswick extension, and securing a High Speed Intercity Passenger Rail Program (HSIPR) grant from the Federal Railroad Administration (FRA) for the Downeaster Corridor Service Development Plan and NEPA documentation.

The latest effort by NNEPRA is to evaluate a possible Lewiston-Auburn expansion of service. In December 2016, NNEPRA engaged the services of VHB and WSP to perform an analysis of this possible expansion, called the Lewiston-Auburn Passenger Rail Service

Plan Project. The project was organized in two distinct phases: (1) transit propensity assessment; and (2) corridor-focused service definitions, evaluations and next steps.

Phase 1, which VHB and WSP are currently under contract for, focuses on the development of a range of ridership estimates by examining similar rail corridors and the demographics and travel demand/patterns of the Study Area. This phase also focuses on the economic development potential of this rail corridor.

Phase 2, which is currently unfunded, will build on the efforts of Phase 1 and examine what kind of service should be provided to meet the travel demand/patterns observed in Phase 1 (i.e., route alignment, service frequency), as well as the costs to build and operate service.

1.2 Purpose of this Report

The purpose of this report is to document the analyses performed as part of Phase 1 of the project, which examines the ridership for a potential passenger rail service to Lewiston-Auburn. Phase 1 was broken up into five distinct tasks, each of which was given a chapter in this report (Chapters 2 through 6). The first four tasks were used as building blocks for the fifth task, the development of a ridership estimate, which is presented in Chapter 6.

Chapter 2 includes a comparison of the Lewiston-Auburn rail corridor to other similar rail corridors. This comparison helps to see how much ridership these passenger rail services has generated, which was used to fine tune the ridership estimates for a potential Lewiston-Auburn service.

Chapter 3 provides a snapshot of the existing travel markets/demand within the Study Area using a variety of data sources. This data was fed into the ridership estimation component of the project.

Chapter 4 examines the potential for increased economic development should a passenger rail service to Lewiston-Auburn be established. This analysis relied on before and after data on Downeaster extension to Brunswick, which was then extrapolated for Lewiston-Auburn. This potential economic development was ultimately incorporated into ridership estimation.

Chapter 5 documents the public outreach efforts for this project, which were aimed at gathering information on the public's travel patterns today, and how they would potentially use a passenger rail service to Lewiston-Auburn. The data generated as part of this effort captures the "human element" to travel, which was also fed into the development of ridership estimates for passenger rail to Lewiston-Auburn.

Chapter 6 presents a range of ridership estimates for passenger rail service to Lewiston-Auburn using the data presented in Chapters 2 through 5. A ridership range is presented in order to account for uncertainties in this early planning stage, which includes an unknown operating plan, and varying levels of growth and connectedness between the Portland and Lewiston-Auburn areas.

1.3 The Project Committee

Overseeing the project was a Project Committee, which was established to represent the diverse views and perspectives of the communities that would be served by a passenger service expansion. The nine-member Project Committee was made up of representatives from NNEPRA and MaineDOT, as well as representatives from the Cities of Lewiston and Auburn.

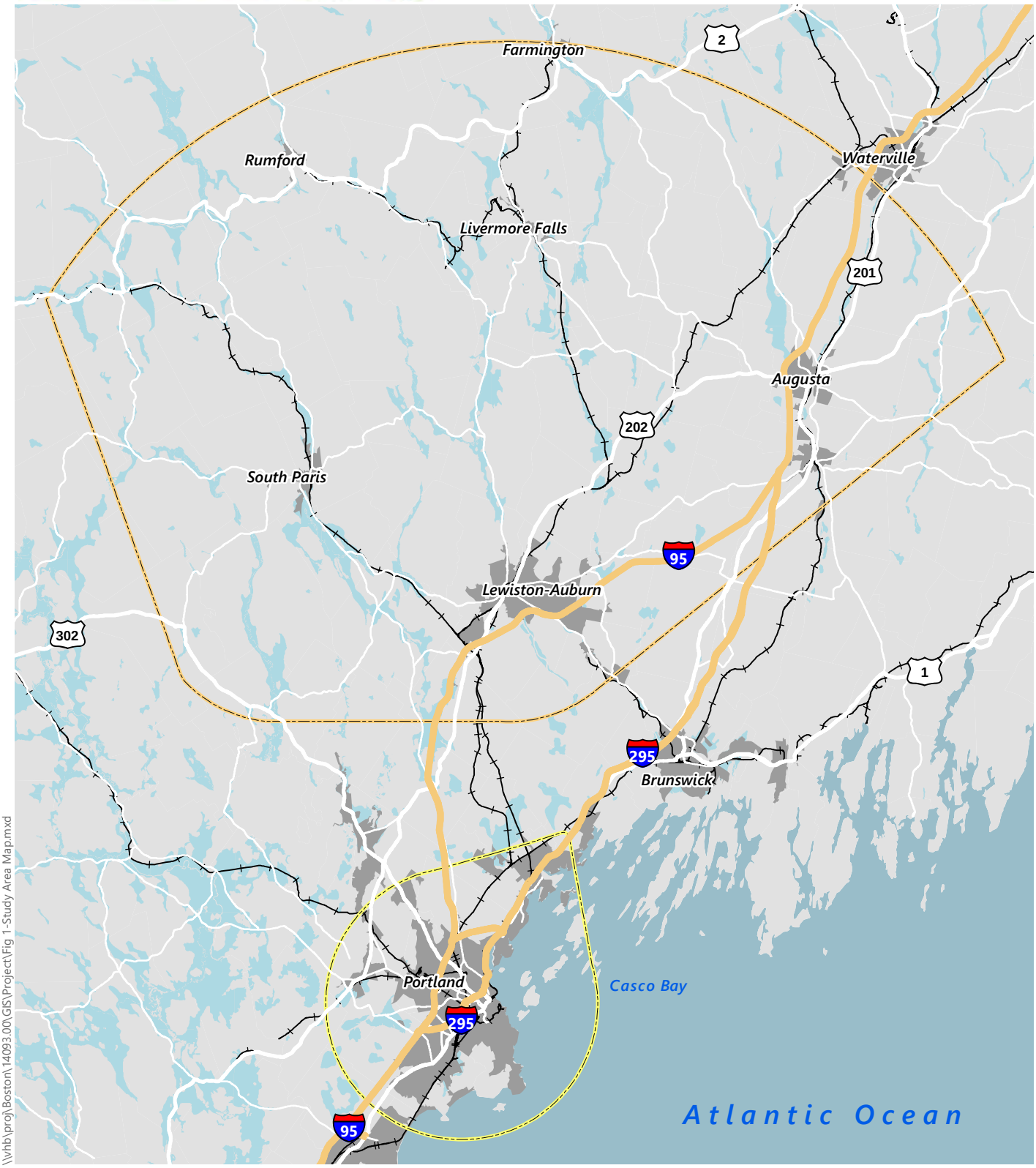
The committee met monthly throughout the project and was involved in all aspects of the project. The committee's responsibilities included guiding and reviewing the work performed by the project team, providing regional knowledge of the Lewiston-Auburn area, and helping to plan and advertise the open houses.

1.4 The Study Area

The two Study Areas for this project were defined based on industry standards and input from the Project Committee, given their local knowledge of the area. One Study Area was drawn for the Lewiston-Auburn area, the second for the Portland area. These are shown in Figure 1.

The Northern Study Area focuses on the area surrounding Lewiston-Auburn and generally consists of a shape with a 10-mile radius to the south and a 40-mile radius to the north, with slight adjustments to the shape to incorporate cities that are tied to Lewiston-Auburn. The 40-mile radius was used because Lewiston-Auburn would be a terminus rail station and would result in a larger capture area than is typical at other passenger rail stations.

The Southern Study Area focuses on the area surrounding Portland and is a teardrop shape, with generally a 10-mile radius, except to the northeast of Portland, where it is elongated to capture the City of Yarmouth.



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Southern Study Area

Northern Study Area

Urban Area

LEWISTON-AUBURN
PASSENGER RAIL SERVICE PLAN

Study Area Map

2

PASSENGER DEMAND ON SIMILAR CORRIDORS

2.1 Introduction

This chapter assesses passenger demand along similar rail transit corridors located throughout the United States as a point of comparison for potential passenger rail service between Lewiston-Auburn and Portland. Seven similar corridors were selected (listed below) and a brief description of each is provided in the sections that follow. Summary tables presenting the service characteristics, as well as 2016 population, average daily ridership, and rail capture rates, for each of the seven similar rail corridors are presented in Table 1 and Table 2.

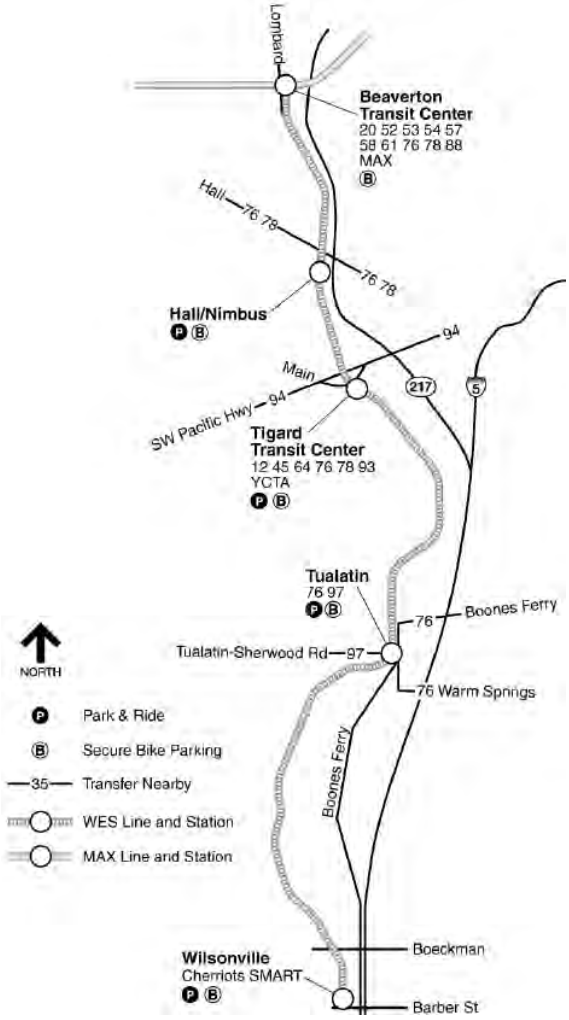
- Westside Express Service (WES) – Greater Portland, OR
- Sonoma-Marin Area Rail Transit (SMART) – Bay Area, CA
- Metro-North Waterbury Branch – Central Connecticut
- Shore Line East – Southeastern Connecticut
- Amtrak Ethan Allen Express – Vermont and Eastern New York
- Amtrak Illinois Corridors – Illinois Zephyr and Carl Sandburg – Quincy to Chicago
- Amtrak Illinois Corridors – Illini, Saluki, and City of New Orleans – Carbondale to Chicago

2.1.1 Westside Express Service (WES) – Greater Portland, OR

To provide high-quality transit connections for suburban communities located to the southwest of Portland, Oregon, the regional transit authority, TriMet, developed the Westside Express Service (WES). The service provides commuter rail connections via diesel multiple unit (DMU) equipment operating between the suburban community of Wilsonville and the Beaverton Transit Center, a regional transit center where disembarking passengers can transfer to 10 bus lines or the MAX light rail, which runs eastward into Portland's downtown core. WES offers 16 weekday round trips and covers its 15-mile route and five stations in approximately 27 minutes with an average speed of 33 miles per hour. A map depicting the WES alignment and its stations is provided in Figure 2.

The service opened in 2009 at a cost of approximately $166 million with an average daily ridership of 1,200 trips. In 2016, just seven years after opening, average daily ridership had increased by approximately 50% to 1,800 average daily trips. The combined population of the four communities served by WES in 2016 was 200,805 while the combined 2016 population of those communities and the City of Portland was 840,668.

Figure 2 Overview of Greater Portland's WES Commuter Rail Service



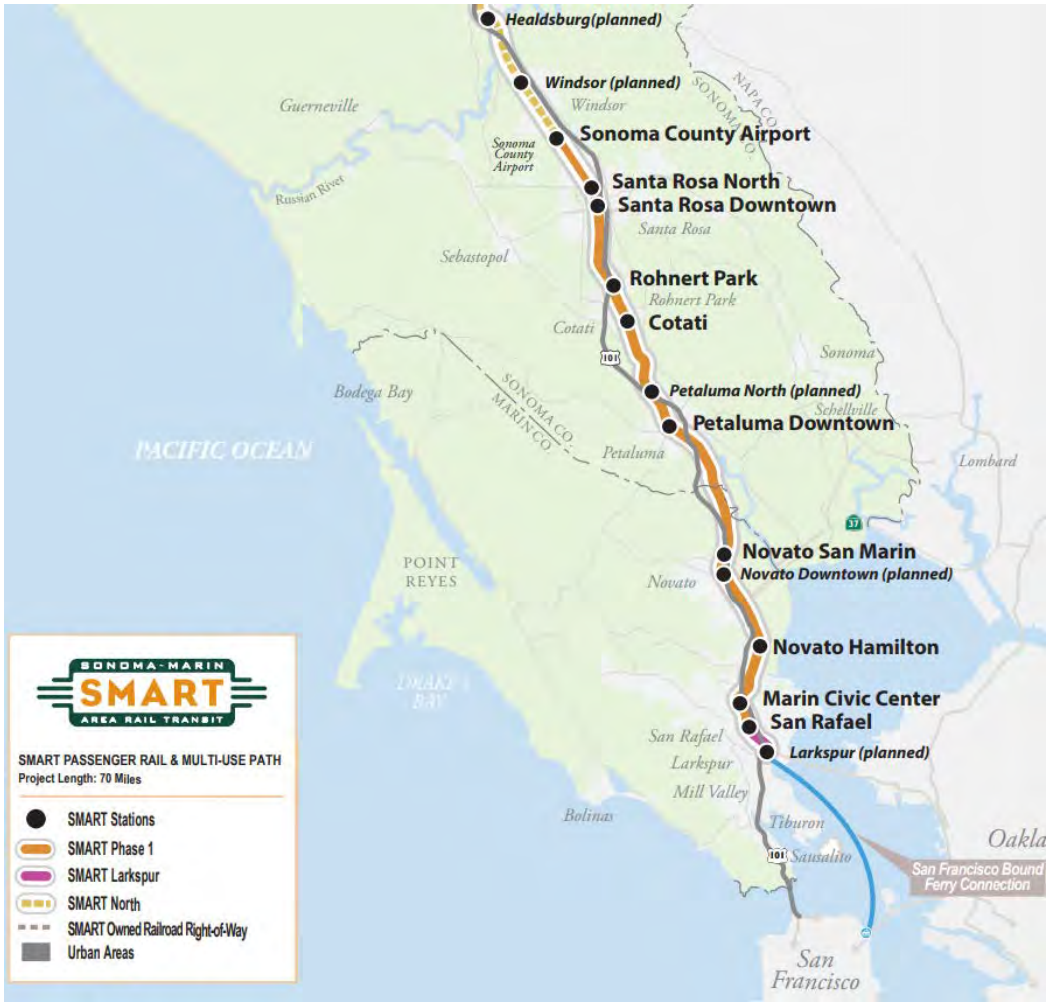
Source: TriMet

2.1.2 Sonoma-Marin Area Rail Transit (SMART) – Bay Area, CA

Located north of San Francisco, Sonoma-Marin Area Rail Transit (SMART) serves Sonoma and Marin counties. Phase 1 of its commuter rail service commenced operations in 2017. The service currently offers commuter rail connections with DMU equipment operating between the Sonoma County Airport to the north and San Rafael to the south, where passengers can then transfer to express bus services that serve regional employment centers in San Francisco, Oakland, and Berkeley. Phase 2 will consist of a southward extension to Larkspur, which is scheduled for completion in 2019, as well as a northward extension to the Cloverdale Depot that is slated to open by 2027. SMART provides 17 weekday round trips and services its 43-mile route and 10 stations in approximately one hour and seven minutes at an average speed of 39 miles per hour. A map depicting the SMART Phase 1 alignment and its stations is provided in Figure 3.

After $428 million in capital improvements for Phase 1, opening year average daily ridership was 2,700 trips. The combined population of the five communities served by SMART in 2016 was 358,098 while the combined 2016 population of those communities and the City of San Francisco was 1,222,914.

Figure 3 Overview of Northern Bay Area's SMART Commuter Rail Service



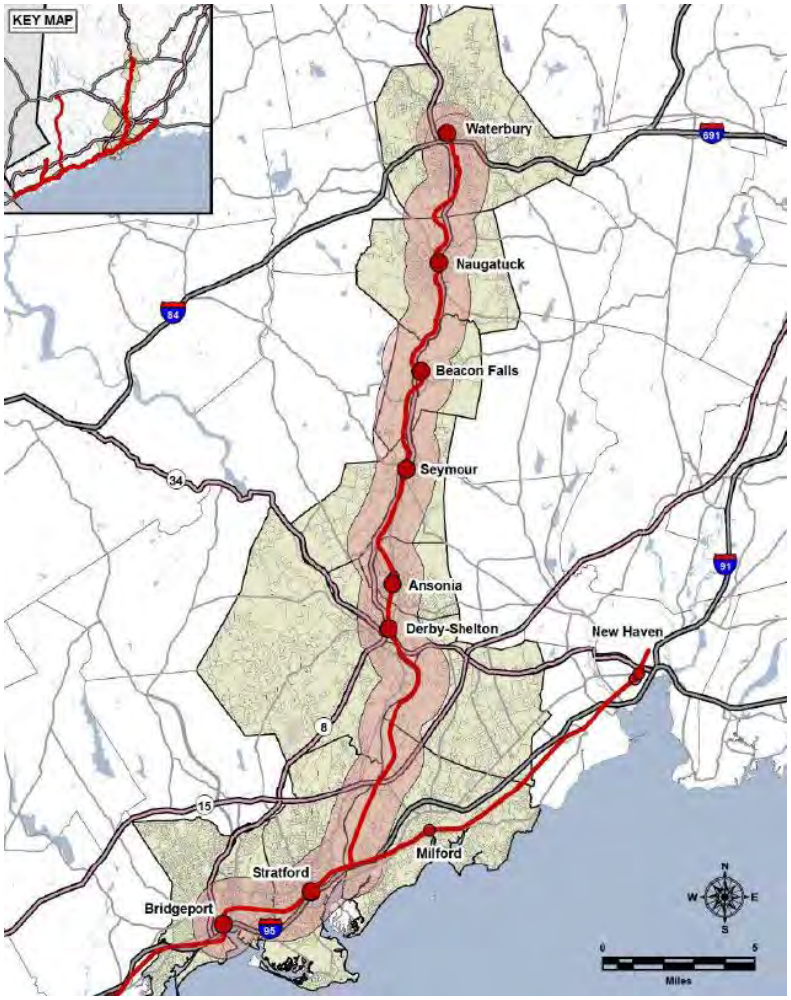
Source: SMART

2.1.3 Metro-North Waterbury Branch – Central Connecticut

To ensure the same level of high quality commuter rail transit is provided to citizens living north of Connecticut's Atlantic Coast Line, Metro-North Railroad augmented its robust network with a north-south spur to serve inland Connecticut residents who commute into New York City. Metro-North's Waterbury Branch provides commuter rail connections via electric multiple unit (EMU) equipment operating between Waterbury to the north and Bridgeport to the south, where passengers can connect to other Metro-North services operating between New Haven and New York City's Grand Central Station. The Waterbury Branch offers 17 weekday round trips and covers its 32-mile route and eight stations in approximately 55 minutes with an average speed of 36 miles per hour. A map depicting the Waterbury Branch and its stations, as well as Metro-North's New Haven main line along the Atlantic coast, is provided in Figure 4.

In 2016, the Metro-North Waterbury Branch had an average daily ridership of 1,300 trips. The combined population of the seven communities served by the Waterbury Branch in 2016 was 287,062 while the combined 2016 population of those communities and the City of Bridgeport was 432,998.

Figure 4 Overview of Metro-North's Waterbury Branch



Source: Metro-North

2.1.4 Shore Line East – Southeastern Connecticut

While the Metro-North Waterbury Branch was developed to bring high quality rail service to inland Central Connecticut, the Shore Line East service was developed as an eastward extension of existing rail service along the Atlantic coastline between New York City and New Haven. The Shore Line East corridor provides intercity rail connections via electric multiple unit (EMU) equipment operating between New London to the east and New Haven to the west, where passengers can transfer to Metro-North's New Haven Line which runs into New York City's Grand Central Station. The service offers 17 weekday round trips and covers its 51-mile route and nine stations in approximately 55 minutes with an average speed of 56 miles per hour. A map depicting the Shore Line East corridor and its stations is provided in Figure 5.

In 2016, the Shore Line East had an average daily ridership of 2,000 trips. The combined population of the 11 communities served by the Shore Line East in 2016 was 175,332 while the combined 2016 population of those communities and the City of New Haven was 305,266.

Figure 5 Overview of Shore Line East

Source: Road and Rail Pictures / Connecticut Department of Transportation

Note: Shore Line East service terminates at New Haven – Union Station

2.1.5 Amtrak Ethan Ellen Express – Vermont and Eastern New York

To provide residents of Vermont, Albany, and eastern New York with passenger rail connections into New York City, Amtrak operates the Ethan Allen Express service. Amtrak's Ethan Allen Express provides intercity rail connections with diesel locomotives operating between Rutland, VT to the north, Albany, NY in the middle, and New York City's Penn Station. The Ethan Allen Express offers one weekday round trip and covers its 241-mile route and 12 stations in approximately five and a half hours with an average speed of 44 miles per hour. A map displaying Amtrak's Ethan Allen Express and its stations is provided in Figure 6.

In 2016, the average daily ridership between Rutland, VT and Saratoga Springs, NY was 368 trips, based on observations at five stations in Rutland and Castleton, VT, and Whitehall, Ft. Edward, and Saratoga Springs, NY. The combined population of the 10 communities served by Amtrak's Ethan Allen Express in 2016 was 234,274 while the combined 2016 population of those communities and the City of Albany was 332,385.

Figure 6 Overview of Amtrak's Ethan Allen Express

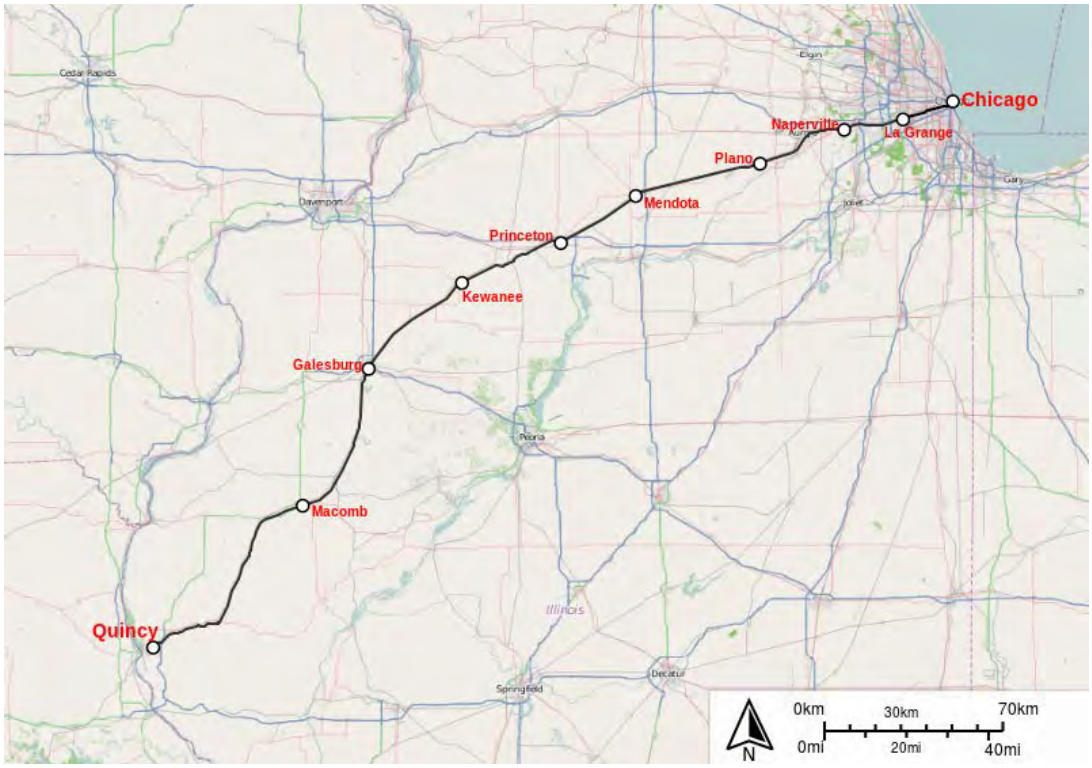
Source: Travelanguist.com

2.1.6 Amtrak Illinois Corridors – Illinois Zephyr and Carl Sandburg (Quincy to Chicago)

Similar to the approach taken for the Metro-North Waterbury Branch and the Shore Line East, one of Amtrak's Illinois corridors provide residents of western Illinois with rail connections into Chicago via state-sponsored Amtrak intercity rail service. Along the same alignment, the Illinois Zephyr serves the traditional commute pattern, providing morning departures into Chicago and evening return trips back to western Illinois, while the Carl Sandburg facilitates reverse commute trips (i.e., morning departures to western Illinois and return trips back to Chicago in the evening). The two services provide intercity rail connections via diesel locomotives operating between Quincy, IL, which is located approximately 230 miles southwest of Chicago, and Chicago to the northeast. The Illinois Zephyr and Carl Sandburg each operate one weekday round trip (two round trips combined per day) and cover the 258-mile route and eight stations in approximately four hours and 20 minutes with an average speed of 60 miles per hour. A map showing Amtrak's Quincy to Chicago corridor and its stations is provided in Figure 7.

In 2016, the average daily ridership along the seven stations spanning from Quincy to Plano was 807 trips. The combined population of the seven communities located outside of Greater Chicago in 2016 was 128,416 while the combined 2016 population of those communities and the City of Chicago was 2,842,433.

Figure 7 Overview of Amtrak's Illinois Zephyr and Carl Sandburg (Quincy to Chicago)



Source: Wikipedia

2.1.7 Amtrak Illinois Corridors – Illini, Saluki, and City of New Orleans (Carbondale to Chicago)

Similar to the Quincy to Chicago service described previously, another of Amtrak's Illinois corridors provide residents of southern Illinois with rail connections into Chicago, as well as New Orleans, via state-sponsored Amtrak intercity rail service. Along the same alignment, the Illini provides overlapping bi-directional intercity service in the evening between Carbondale (which is located approximately 290 miles south of Chicago) and Chicago while the Saluki offers overlapping bi-directional intercity service in the afternoon. In addition to these state-sponsored routes, the corridor is also served by Amtrak's City of New Orleans service, which allows for northbound and southbound overnight stops in southern Illinois.

The Illini, Saluki, and City of New Orleans each operate one weekday round trip (three round trips combined per day) using diesel locomotives and coaches to cover the 309-mile route and nine stations in approximately five and a half hours with an average speed of 56 miles per hour. A map showing Amtrak's Carbondale to Chicago corridor and its stations is provided in Figure 8.

In 2016, the average daily ridership along the nine stations spanning from Carbondale to Kankakee was 1,036 trips. The combined population of the nine communities located outside of Greater Chicago in 2016 was 244,925 while the combined 2016 population of those communities and the City of Chicago was 2,958,942.

Figure 8 Overview of Amtrak's Illini and Saluki (Carbondale to Chicago)

Source: Wikipedia

Table 1 Summary of Similar Rail Corridors Service Characteristics

Similar Rail Corridor	Service Description	Weekday Round Trips	Length (mi)	Stations	Trip Time	Average Speed (mph)
Westside Express Service (WES) Greater Portland, OR	Commuter rail route connecting suburban Wilsonville to a transit station which provides connecting light rail service to Portland	16	15	5	0:27	33
Sonoma-Marin Area Rail Transit (SMART) Bay Area, CA	Commuter rail service between northern Santa Rosa and downtown San Rafael with bus connections to San Francisco	17	43	10	1:07	39
Metro-North Waterbury Branch Central CT	Intercity rail shuttle between Waterbury and Bridgeport that offers connections to Metro-North's New Haven Line to NYC	8	32	8	0:55	36
Shore Line East Southeastern CT	Intercity rail service connecting New London and Old Saybrook to Metro-North's New Haven Line to NYC	17	51	9	0:55	56
Amtrak Ethan Allen Express VT & Eastern NY	Intercity rail service connecting Vermont and Albany with NYC	1	241	12	5:30	44
Amtrak IL Corridors – Quincy to Chicago	Intercity rail service connecting Chicago to communities in the southwest	2	258	8	4:20	60
Amtrak IL Corridors – Carbondale to Chicago	Intercity rail service connecting Chicago to communities to the south, including Champaign-Urbana	3	309	9	5:30	56
Lewiston-Auburn to Portland Greater Portland, ME	To be determined	TBD	30	2	TBD	TBD

Corridors with similar length and trip time as potential passenger rail service between Lewiston-Auburn and Portland
Corridors with similar length and daily round trips as potential passenger rail service between Lewiston-Auburn and Boston

Table 2 Summary of Similar Rail Corridors Population and Ridership

Similar Rail Corridor	2016 Average Daily Ridership	2016 Area Population [1]	2016 Capture Rate [2]	2016 Regional Population
Westside Commuter Express (WES) Greater Portland, OR	1,800	200,805	0.90%	840,668
Sonoma-Marin Area Rail Transit (SMART) Bay Area, CA	2,700	358,098	0.75%	1,222,914
Metro-North Waterbury Branch Central CT	1,300	287,062	0.45%	432,998
Shore Line East Southeastern CT	2,000	175,332	1.14%	305,266
Amtrak Ethan Allen Express VT & Eastern NY	368*	60,131*	0.61%	332,385
Amtrak IL Corridors – Quincy to Chicago	807	128,416	0.63%	2,842,433
Amtrak IL Corridors – Carbondale to Chicago	1,036	244,925	0.42%	2,958,942
Lewiston-Auburn to Portland Greater Portland, ME	N/A	329,422	N/A	563,052

Corridors with similar 2016 Area Population as potential passenger rail service serving the Study Area

[1] "Area Population" refers to the population residing within station-area communities not including the major terminus (e.g., New York City, San Francisco, Bridgeport, New Haven, and Chicago). The "Regional Population" reflects the "Area Population" plus the population of the service's major terminus.

[2] "Capture Rate" is defined as the 2016 average daily ridership divided by the "Area Population"

* Although the Area Population of all non-NYC communities in 2016 was 234,274, ridership data was only available for five select communities between Rutland, VT and Saratoga Springs, NY in which the 2016 population was 60,131. The capture rate presented above reflects ridership statistics for the stations/communities where data was available.

2.2 Results of Review

The similar rail corridors presented above can broadly be grouped into two categories based on end-to-end trip time – short-haul (less than an hour and a half) and long-haul (longer than an hour and a half).

The short-haul services in Oregon, California, and Connecticut reflect rail transit services that connect outlying suburban areas to major activity and employment centers within the same general region. As these short-haul services typically operate along a distance of up to 50 miles, these services are typically utilized by work commuters who either chose to live further away from their places of employment for various reasons, including being unable to afford to live proximate to their workplace.

The long-haul services operated by Amtrak in Vermont, eastern New York, and Illinois correspond to rail transit services that connect major activity and employment centers to rural and suburban communities. As these long-haul services typically operate for 100 miles or more, which is longer than a typical commuting distance, these services are typically utilized by passengers who are either taking a recreational/leisure trip (either to or away from the major city) or business travelers who are attending a meeting away from their day-to-day place of employment.

In terms of projecting ridership for a potential passenger service terminating in Lewiston-Auburn, the capture rates for similar corridors calculated in Table 2 can be used in conjunction with recent population data for the Lewiston-Auburn area to determine a realistic lower and upper bound estimate of future ridership for a potential passenger rail service to Lewiston-Auburn.

Given that the straight-line distance between Lewiston-Auburn and Portland is approximately 30 miles, the capture rates for the short-haul services can be used to project the demand for passenger rail travel between these two markets while the long-haul capture rates can be used to gauge the demand for rail travel between Lewiston-Auburn and Boston. The minimum, maximum, and average capture rate for the short-haul, long-haul, and all similar corridors is presented in Table 3.

Table 3 Rail Capture Rate for Similar Corridors

Similar Corridor Type	Relevant Market	Capture Rate		
		Minimum	Maximum	Average[1]
Short-Haul	To Portland	0.45%	1.14%	0.76%
Long-Haul	To Boston	0.42%	0.63%	0.51%
Both	Either	0.42%	1.14%	0.69%

[1] "Average" is defined as the total "Area Population" of the short- or long-haul services divided by the total "Average Daily Ridership" for those services.

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3

EXISTING TRAVEL MARKETS

3.1 Introduction

As part of the planning process for potential passenger rail service to Lewiston-Auburn, it is important to understand how people in the Study Area are traveling today. This includes where people are traveling from and going to, how vehicular travel may be increasing or decreasing, and how the Downeaster service is currently being utilized. Understanding how people travel will enable the development of ridership estimates that reflect the local travel patterns. It will also enable the development of passenger rail service operating plans (as part of a future effort) that more directly match the anticipated travel demand.

To understand travel in the Study Area, this chapter presents data collected from a wide variety of sources. These data sources include: traffic counts, population and employment data, major trip generators, and Downeaster ridership data. Each of these data sources is discussed in greater detail in their respective sections.

3.2 Traffic Volume Data

Current and historical traffic volumes were obtained from MaineDOT and the Maine Turnpike to assess traffic feeding into the Lewiston-Auburn area and into Portland. Traffic volume data can be useful in seeing the growth (or decline) in traffic over time, as well as the seasonality of traffic based on the time of year. Any observed traffic growth can be used to estimate potential growth in ridership for a passenger rail service to Lewiston-Auburn, while the seasonality data can be used to estimate peak months for ridership.

In consultation with the Project Committee, average daily traffic and seasonal traffic data was collected for the following major roadways:

- I-95 (the Maine Turnpike)
- I-295
- US 1
- US 202
- SR 4
- SR 9
- SR 26
- SR 121
- SR 122
- SR 125
- SR 126
- SR 136
- SR 196

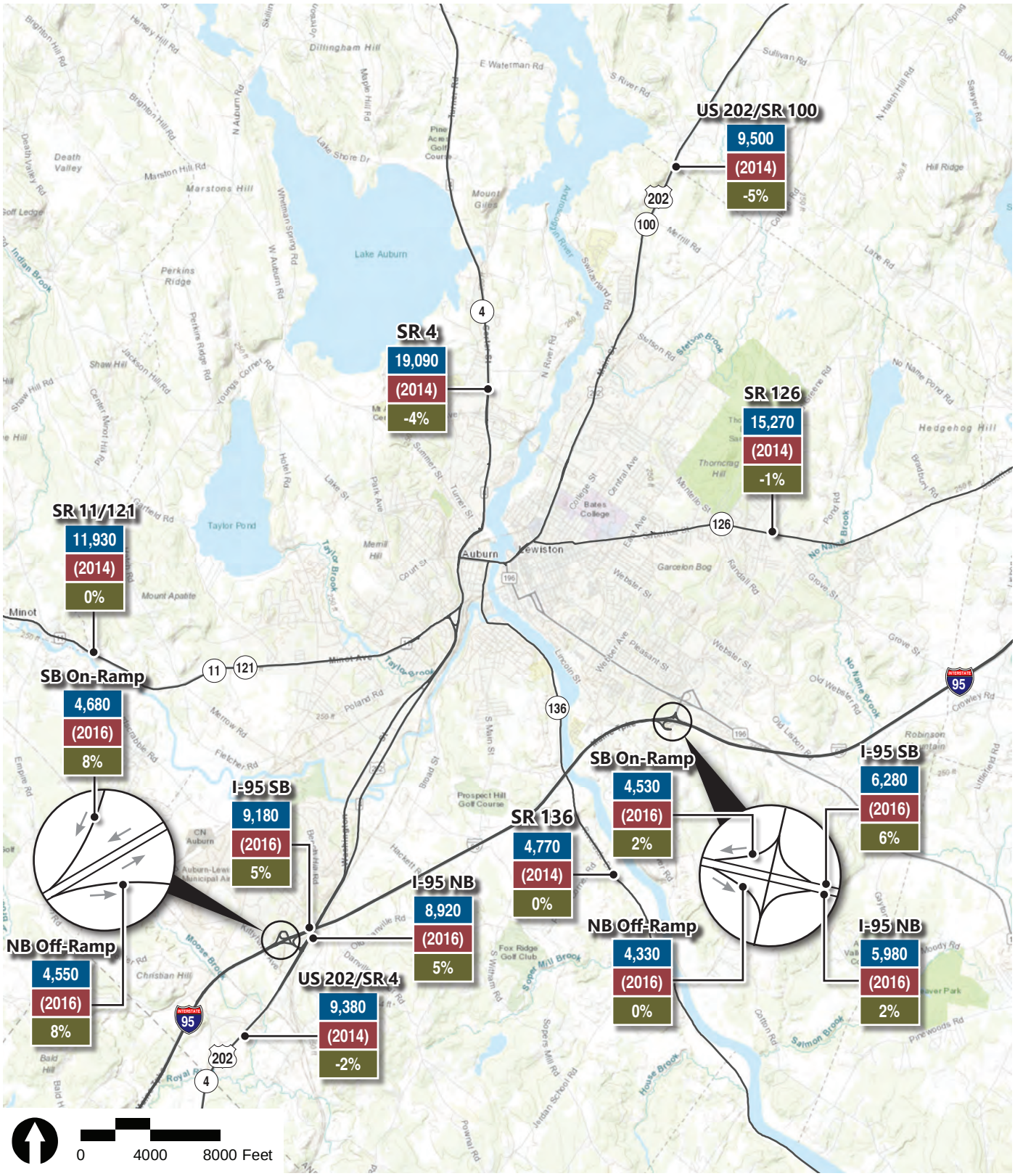
3.2.1 Average Daily Traffic

Average Daily Traffic (ADT) and Average Annual Daily Traffic (AADT) data represents typical traffic volumes for an average day. Traditionally, this data is used to understand overall traffic flow through an area and to assess whether traffic is growing, declining, or staying flat over time. For purposes of this study, this data was collected to use as an input to the passenger rail ridership estimate, particularly as it relates to annual ridership growth. This growth is important to understand because a large portion of ridership for passenger rail will likely result from people shifting from driving to riding the train.

AADT data from 2010 to 2016 along the previously identified roadways were collected and summarized at key locations. Due to the large amount of information, only the most recent traffic data collected for roadways entering the Lewiston-Auburn area and the Portland area are included in this report (see Figure 9 and Figure 10, respectively). Historical AADT at these locations, as well as AADT data outside of these areas, are included in tabular format in Appendix A.

The major roadways feeding into the Lewiston-Auburn area are shown in Figure 9. As can be seen, the Turnpike has experienced growth in traffic volumes while all other major roadways have experienced flat or declining traffic volumes.

The major roadways feeding into Portland are shown in Figure 10. Like Figure 9, the Interstates experienced growth in traffic volumes while the other major roadways experienced declining traffic volumes.



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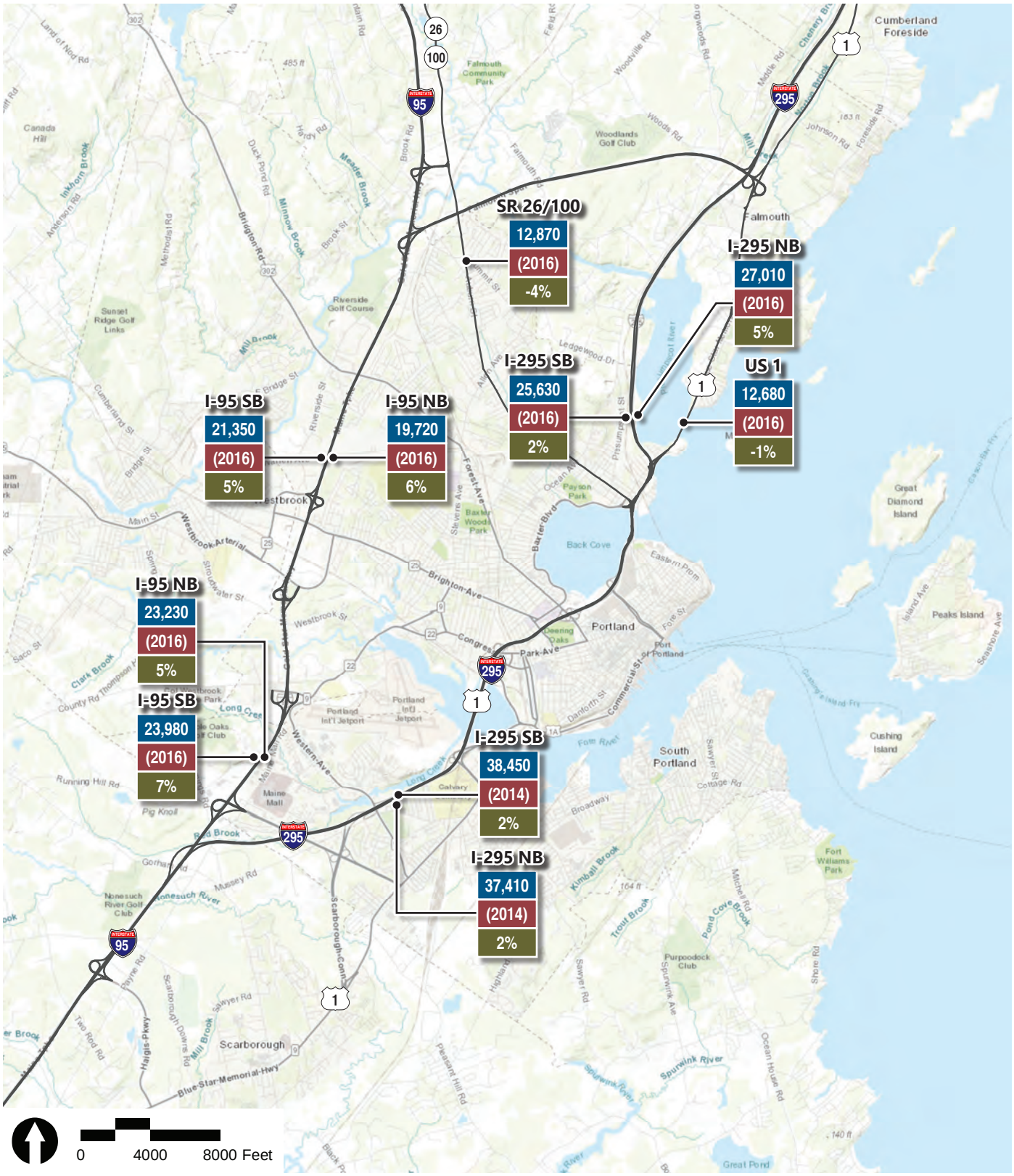
#	Average Annual Daily Traffic (AADT)
(#)	Most Recent Year Data is Available
%	Average Annual Percentage Growth in Traffic since Last Count

LEWISTON-AUBURN
PASSENGER RAIL SERVICE PLAN

Traffic Volumes and Growth Rates for Roadways Feeding into Lewiston-Auburn

Source: MaineDOT



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#	Average Annual Daily Traffic (AADT)
(#)	Most Recent Year Data is Available
%	Average Annual Percentage Growth in Traffic since Last Count

LEWISTON-AUBURN
PASSENGER RAIL SERVICE PLAN

Traffic Volumes and Growth Rates for Roadways Feeding into Portland

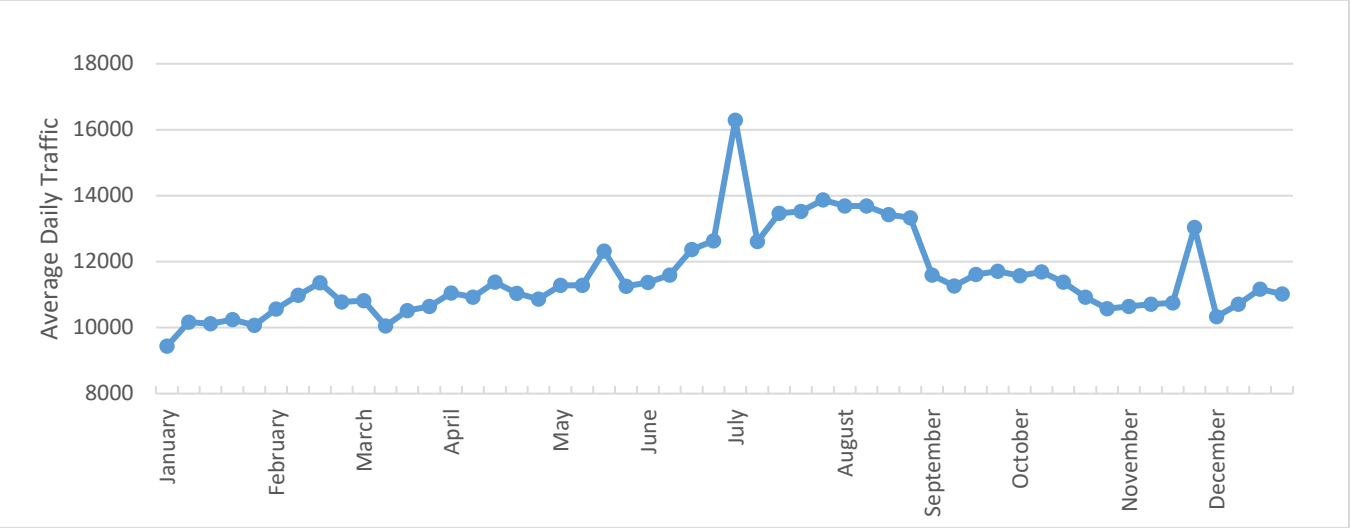
Source: MaineDOT

3.2.2 Seasonal Traffic Data

Seasonal traffic data was collected as part of this study to better understand how people's travel behavior changes based on the time of the year. This data relied on Average Daily Traffic (ADT) volumes, collected on I-95 and I-295. This seasonality in travel was ultimately used to refine the ridership estimate for passenger rail service.

Average daily traffic (ADT) volumes on I-95 are presented in Figure 11 and Figure 12 in the northbound and southbound directions, respectively.

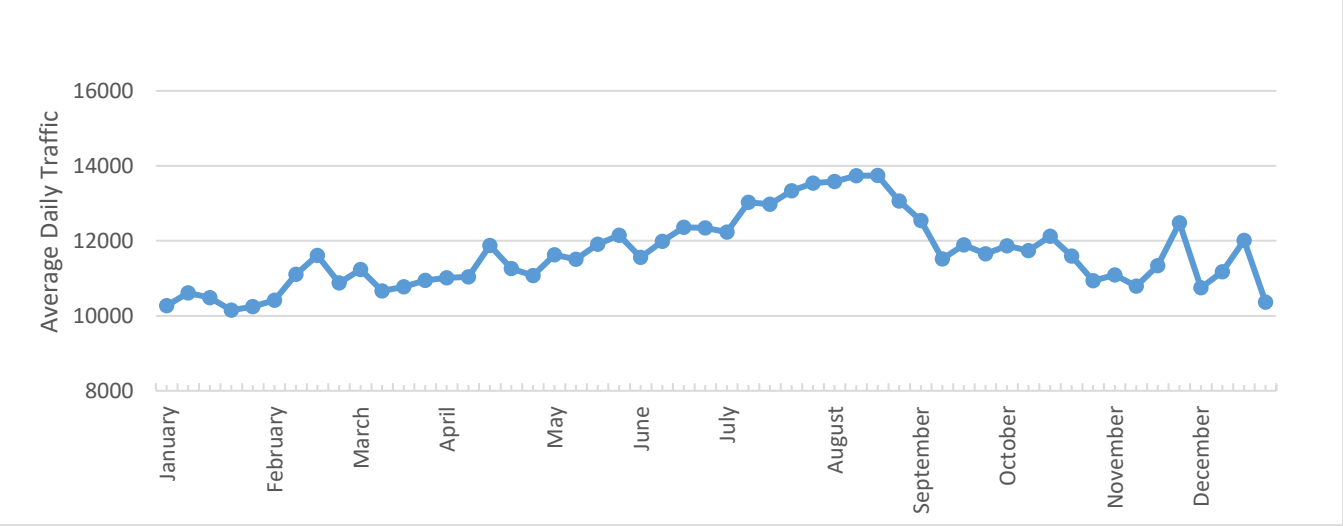
Figure 11 2017 I-95 Northbound Average Daily Traffic



Source: Maine Turnpike

Note: Measured between Gray and Auburn Interchanges

Figure 12 2017 I-95 Southbound Average Daily Traffic

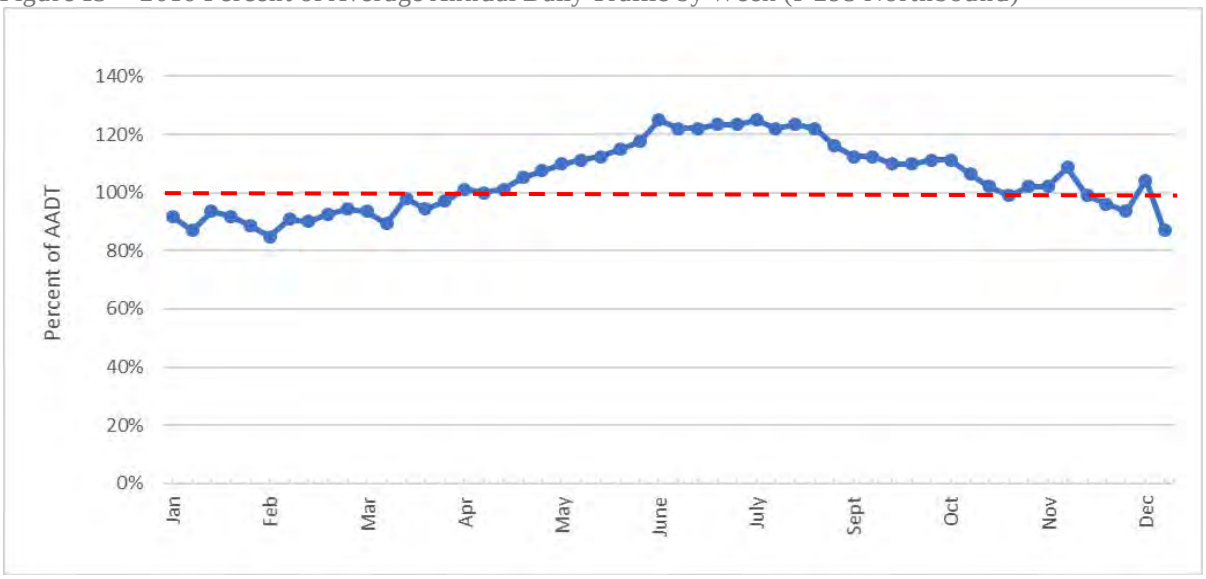


Source: Maine Turnpike

Note: Measured between Gray and Auburn Interchanges

Data for I-295 in the northbound and southbound directions is presented in Figure 13 and Figure 14, respectively. This data, presented as the percentage of average annual daily traffic (AADT), also shows traffic tends to peak in the summer months, roughly from late May to early September.

Figure 13 2016 Percent of Average Annual Daily Traffic by Week (I-295 Northbound)



Source: MaineDOT

Note: 1. Percent AADT factored over 4.5 days

2. Measured 0.7 miles north of I-295 at US 1 off-ramp

Figure 14 2016 Percent of AADT by Week (I-295 Southbound)

Source: MaineDOT

Note: 1. Percent AADT factored over 4.5 days

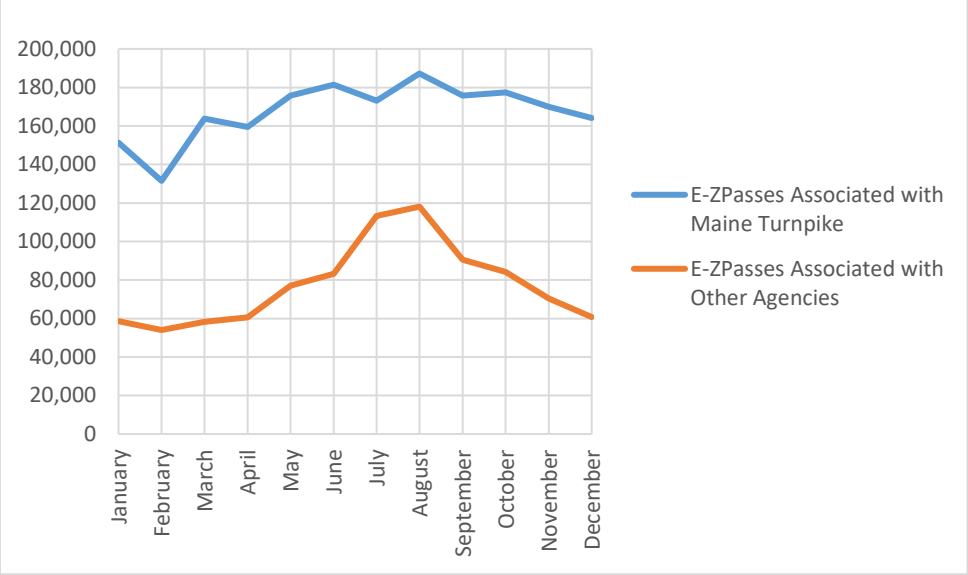
2. Measured 0.7 miles north of I-295 at US 1 on-ramp

3.2.3 Resident vs. Non-Resident Travel

E-ZPass transaction data was obtained from Maine Turnpike to understand who is using the Turnpike (residents vs. non-residents) based on the time of the year. This data was used as an input into the ridership estimate to better approximate the proportion of riders who are Maine residents.

E-ZPass transaction data for passenger cars at the New Gloucester Plaza, located between the Gray and Auburn interchanges, is depicted in Figure 15. Figure 15 breaks down the passenger car E-ZPass transactions by transponders associated with Maine Turnpike and those that are not, which provides a representation of resident and non-resident travel. “Non-resident” travel has a more distinct peak than “resident” travel, while both experience peaks in the summer months.

Figure 15 2017 Monthly E-ZPass Passenger Car Transactions at New Gloucester Plaza



Source: Maine Turnpike

Note: Passenger car transactions at New Gloucester Plaza

3.3 Turnpike Origin-Destination Data

In analyzing who might use a potential passenger rail service to Lewiston-Auburn, it is important to consider where people are coming from and going to. This is especially important if you wish to capture some riders who are currently driving. One way to assess this is by using the 2010 Origin-Destination (O-D) survey that was conducted by the Maine Turnpike.

This survey, which was distributed to drivers that used the Turnpike for a portion of their trip, captures which exits on the Turnpike drivers started and ended their trip. Using this data, it is possible to estimate the estimate current travel demand between Lewiston-Auburn and Portland, which can then be incorporated into the ridership estimate.

For analysis purposes, multiple interchanges in the dataset were grouped together as more than one interchange served a given region. Starting in the north, interchanges 75, 80, and 86 (serving Auburn, Lewiston, and Sabattus, respectively) were combined. The Sabattus interchange was grouped with the Lewiston and Auburn interchanges because of Sabattus' close proximity to the two cities, and being within the potential capture area for a Lewiston-Auburn passenger rail service.

For Gray, interchange 63 data was examined. For Portland, interchanges 45, 46, 47, 48, 52, and 53 were combined into one group. All interchanges that fell south of Portland (i.e., south of interchange 45) were combined into the "South of Portland" group. Any other interchanges that were outside of the Turnpike system fell into the "Other" group.

The Origin-Destination table summary is shown in Table 4. As seen in the table, there is a strong connectivity between the Lewiston-Auburn + Sabattus area and Portland, with a large portion of trips starting and/or ending in one of these two regions.

Table 4 Origin-Destination Table from Maine Turnpike Survey

		Destination						
		Gardiner / Augusta and Points North of Turnpike	**L-A + Sabattus**	**Gray**	**Portland**	**South of Portland (Wells to I-295)**	**South of Maine Turnpike (York Plaza)**	**Total**
Origin	**Gardiner / Augusta and Points North of Turnpike**	0.2%	1.6%	0.7%	1.5%	0.8%	3.1%	7.9%
	L-A + Sabattus	3.0%	4.3%	0.7%	3.8%	1.8%	1.6%	15.1%
	Gray	0.6%	0.8%	0.0%	2.5%	0.8%	0.7%	5.5%
	Portland	1.3%	2.4%	2.1%	10.5%	7.9%	7.2%	31.4%
	South of Portland (Wells to I-295)	1.1%	0.7%	0.6%	9.8%	7.7%	5.9%	25.9%
	South of Maine Turnpike (York Plaza)	2.4%	1.0%	0.4%	5.5%	4.7%	0.1%	14.1%
	Total	8.6%	10.8%	4.5%	33.7%	23.8%	18.7%	100.0%

Source: 2010 Maine Turnpike O-D Survey

Using this O-D data, it is also possible to estimate the percentage of vehicles at each interchange traveling between Lewiston, Auburn, and Sabattus and Portland. The results of this analysis are shown in Table 5 and Table 6.

Table 5 Percentage of Entering I-95 Southbound Traffic Destined for Portland

Entering Interchange Number	Percentage of Southbound Traffic Destined for Portland
86 (Sabattus)	18.9%
80 (Lewiston)	33.0%
75 (Auburn)	51.5%

Source: 2010 Maine Turnpike O-D Survey

Note: Portland exits were defined as Exits 45, 46, 47, 48, 52, and 53

Table 6 Percentage of Entering I-95 Northbound Traffic Destined for the L-A Area

Entering Interchange Number	Percentage of Northbound Traffic Destined for the L-A Area
45	16.1%
46	15.6%
47	16.5%
48	27.9%
52	27.5%
53	48.7%

Source: 2010 Maine Turnpike O-D Survey

Note: L-A and Sabattus exits were defined as Exits 75, 80, and 86

Using Table 5 and Table 6, it is estimated that between 4,000 and 4,500 auto trips occur between the Lewiston-Auburn area and Portland; 4,000 to 4,500 auto trips equate to roughly 5,000 to 5,500 people. This information is useful in developing ridership estimates for passenger rail service, by better accounting for any shift in travel mode from driving to taking the train.

3.4 Population

Historical and projected population data were obtained from the US Census Bureau and Maine's Statewide Travel Demand Model (STDM), respectively, to assess growth patterns over time within the Study Area and adjacent regions. This data can be used as the fundamental basis for forecasting estimates of opening year and long-range ridership of a potential passenger rail service.

3.4.1 Historical Population Trends

Historical counts of population within the Northern Study Area, the Southern Study Area, the three counties (Kennebec to the north, Androscoggin in the center, and Cumberland to the south), and the State of Maine spanning from 2000 to 2016 are summarized in Table 7 and Figure 16.

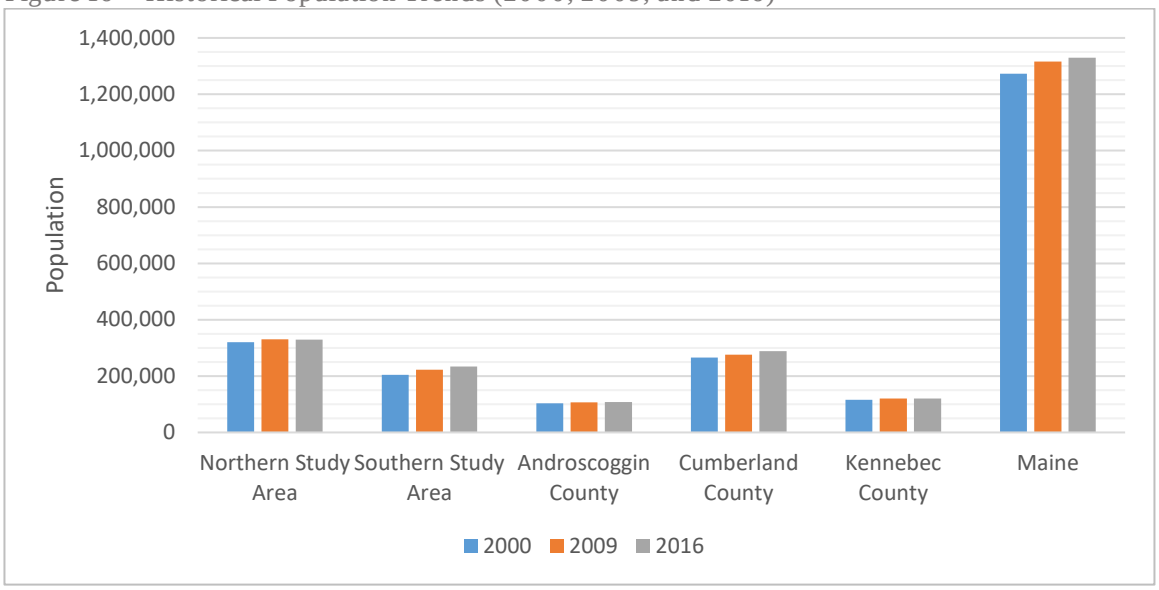
In terms of overall population in 2016, the Northern Study Area contained 41 percent more residents than the Southern Study Area and at least 14 percent more residents than the most populous county (Cumberland). In addition to accounting for 64 percent of the residents living within the three counties, the Northern Study Area was home to approximately 25 percent of all Maine residents in 2016.

Table 7 Historical Population Growth (2000, 2009, and 2016)

	Population			Change	
	2000	2009	2016	2000-2016	2009-2016
Northern Study Area	320,162	330,785	329,422	2.9%	-0.4%
Southern Study Area	204,567	222,267	233,630	14.2%	5.1%
Androscoggin County	103,793	106,765	107,376	3.5%	0.6%
Cumberland County	265,612	276,227	288,204	8.5%	4.3%
Kennebec County	115,758	120,777	120,953	4.5%	0.1%
Maine	1,272,710	1,316,380	1,329,923	4.5%	1.0%

Source: US Census Bureau – 2000 Decennial Census; 2005-2009 and 2012-2016 American Community Survey 5-Year Estimates

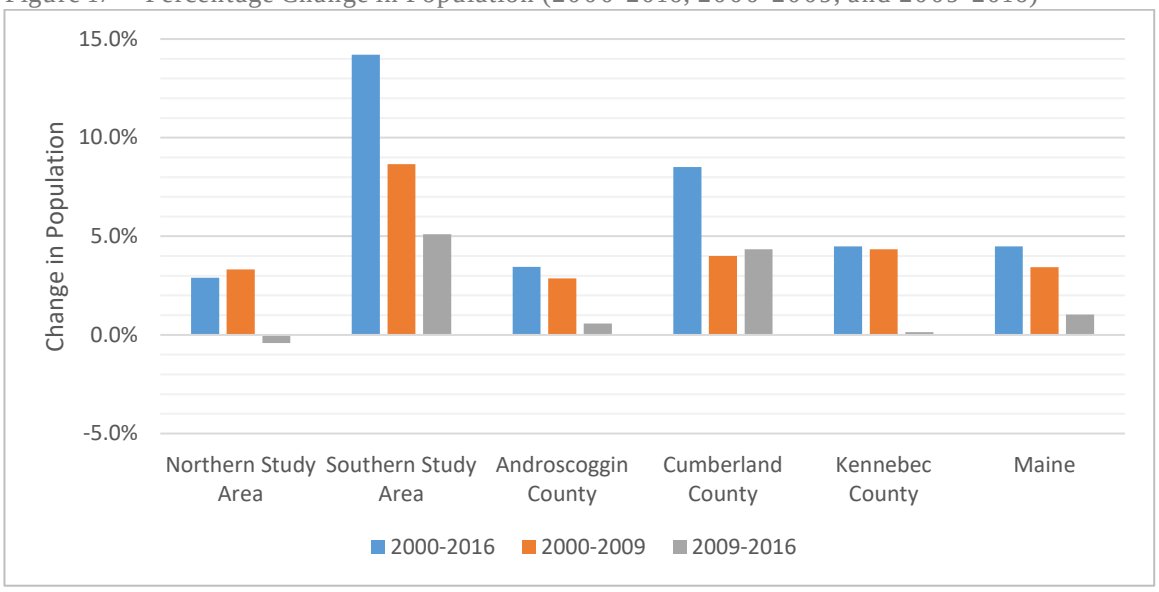
Figure 16 Historical Population Trends (2000, 2009, and 2016)



Source: US Census Bureau – 2000 Decennial Census; 2005-2009 and 2012-2016 American Community Survey 5-Year Estimates

The relative change in population between 2000 and 2016, as well from 2000 to 2009 and 2009 to 2016, for each of the geographies is depicted in Figure 17. Led by the Southern Study Area at 14 percent, each of the areas added more residents between 2000 and 2016 and a similar growth rate was observed from 2000 to 2009. While the Southern Study Area and Cumberland County continued to grow rapidly between 2009 and 2016, the Northern Study Area experienced a slight decline in population while the other geographies experienced modest increases.

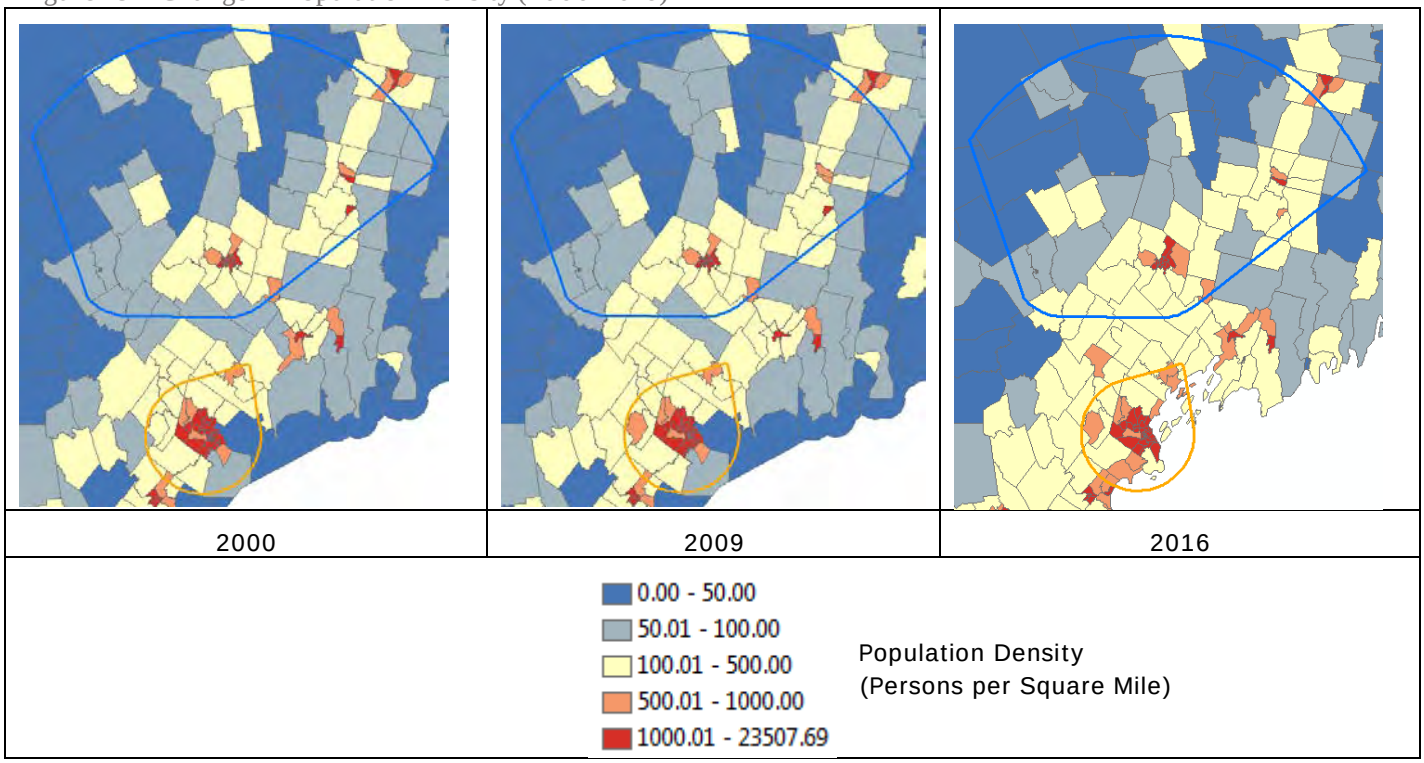
Figure 17 Percentage Change in Population (2000-2016, 2000-2009, and 2009-2016)



Source: US Census Bureau – 2000 Decennial Census; 2005-2009 and 2012-2016 American Community Survey 5-Year Estimates

Owing to the positive trend in total population, the population density in each of the areas also increased from 2000 to 2016, as seen in Figure 18. In 2000, Lewiston-Auburn, central Portland, Brunswick, and Augusta were each within the top tier of population density (at least 1,000 persons per square mile) while the areas immediately adjacent to these relatively high-density communities typically had a density in the third (100 to 500 persons per square mile) or fourth tier (50 to 100 persons per square mile). As seen in the right of Figure 18, all the communities adjacent to Lewiston-Auburn and Portland were in the third tier by 2016, leading to the formation of a denser (at least 100 persons per square mile) north-south corridor linking Lewiston-Auburn to Portland. This trend suggests that there is a strong connection between these two travel markets.

Figure 18 Change in Population Density (2000-2016)



Source: US Census Bureau – 2000 Decennial Census; 2005-2009 and 2012-2016 American Community Survey 5-Year Estimates

3.4.2 Population Projections

Population forecasts for the Northern Study Area and the Southern Study Area in 2010 and 2040 from the Maine STDM are provided in Table 8 and Figure 19.

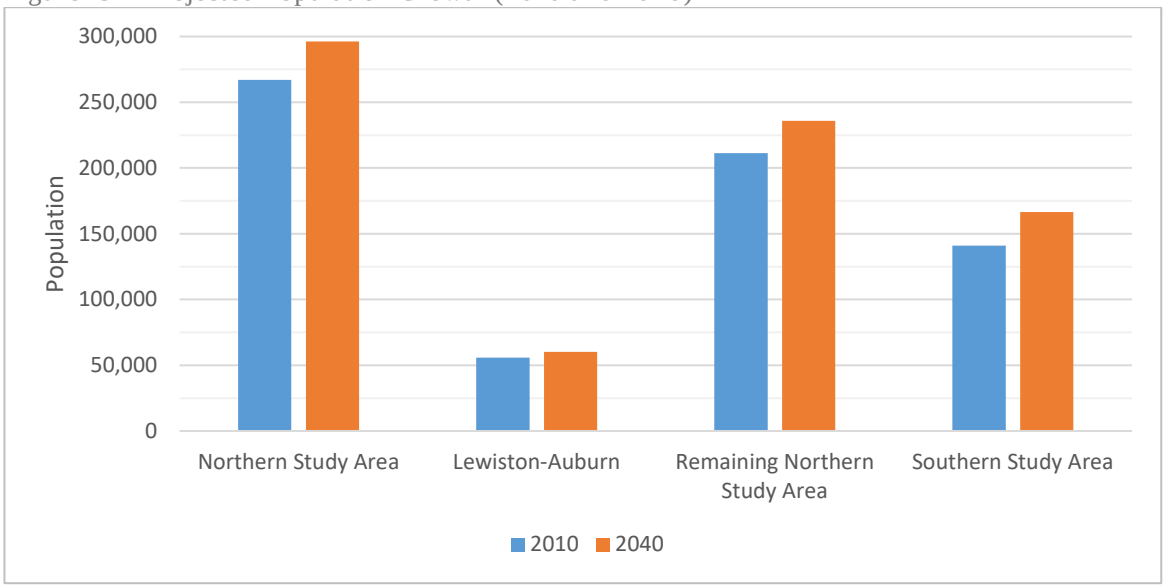
The Northern Study Area is expected to add over 29,000 residents over the 30-year period (11 percent growth), including approximately 149 additional residents per year (eight percent growth) in Lewiston-Auburn alone. Similar to the historical trend described previously, the Southern Study Area is anticipated to grow at a faster rate (18 percent), resulting in an average of approximately 1,830 new residents per year (14 percent) across the two travel markets combined through 2040.

Table 8 Projected Population Growth (2010 and 2040)

	Population		Change	
	2010	2040	Absolute	Percentage
Northern Study Area	266,995	296,266	29,271	11.0%
Lewiston-Auburn	*55,800*	*60,270*	*4,470*	*8.0%*
Remaining Northern Study Area	*211,195*	*235,996*	*24,801*	*11.7%*
Southern Study Area	140,910	166,520	25,610	18.2%
Total	407,905	462,786	54,881	13.5%

Source: Maine STDM

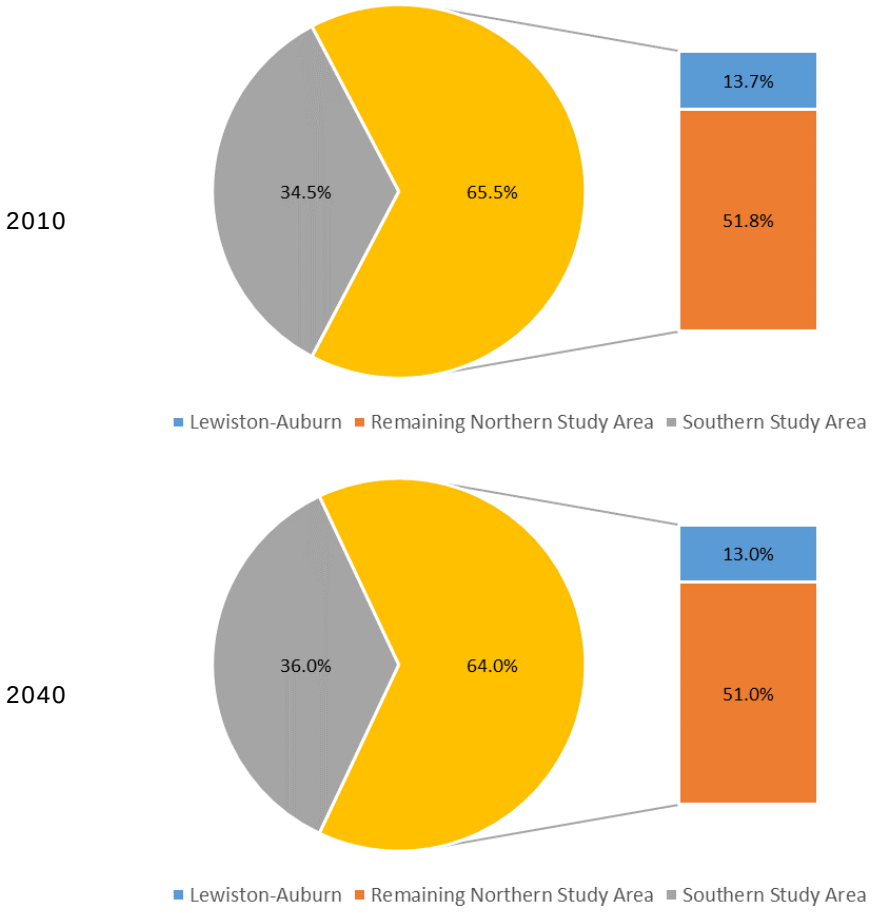
Figure 19 Projected Population Growth (2010 and 2040)



Source: Maine STDM

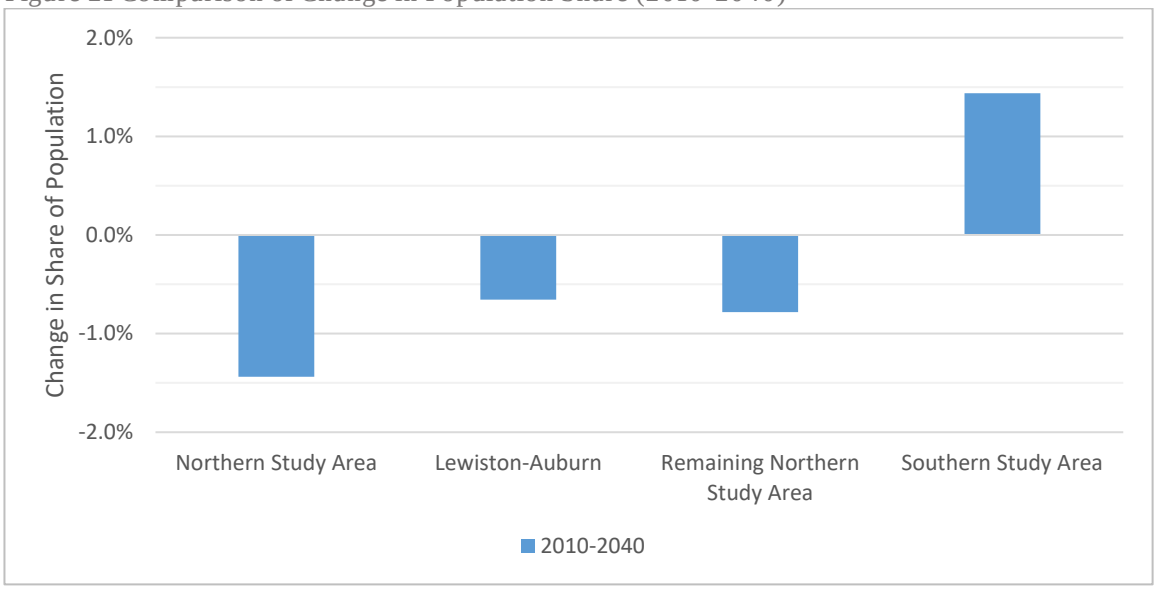
The share of the overall forecast population in 2010 and 2040 for Lewiston-Auburn, the remaining Northern Study Area, and the Southern Study Area is presented in Figure 20. In 2010, the Northern Study Area was home to approximately 66 percent of the residents within the two travel markets, including 14 percent in Lewiston-Auburn and nearly 52 percent in the remaining portion. As seen in Figure 21, the Maine STDM projects that in 2040 the Northern Study Area's share of total population between the two travel markets will decrease by approximately two percent, resulting in Lewiston-Auburn and the remaining Northern Study Area housing 13 percent and 51 percent, respectively, of the combined population within the two travel markets.

Figure 20 Comparison of Population Share (2010 and 2040)



Source: Maine STDM

Figure 21 Comparison of Change in Population Share (2010-2040)



Source: Maine STDM

3.5 Employment

Historical and projected employment were retrieved from the Maine Department of Labor, US Census Bureau, and the Maine STDM to analyze employment change over time within the Study Area and adjacent regions. While the Maine Department of Labor and US Census Bureau data can be utilized to assess historical employment conditions for residents, the Maine STDM projections enable an assessment of the magnitude of employment opportunities within the two travel markets that could be accessed via a potential passenger rail service to Lewiston-Auburn.

3.5.1 Historical Employment Trends

Historical records of the unemployment rate (not seasonally-adjusted) within the Lewiston-Auburn Metro area, the Portland-South Portland Metro area, the Brunswick Micro area, and the State of Maine from the Maine Department of Labor are summarized in Table 9 and Figure 22.

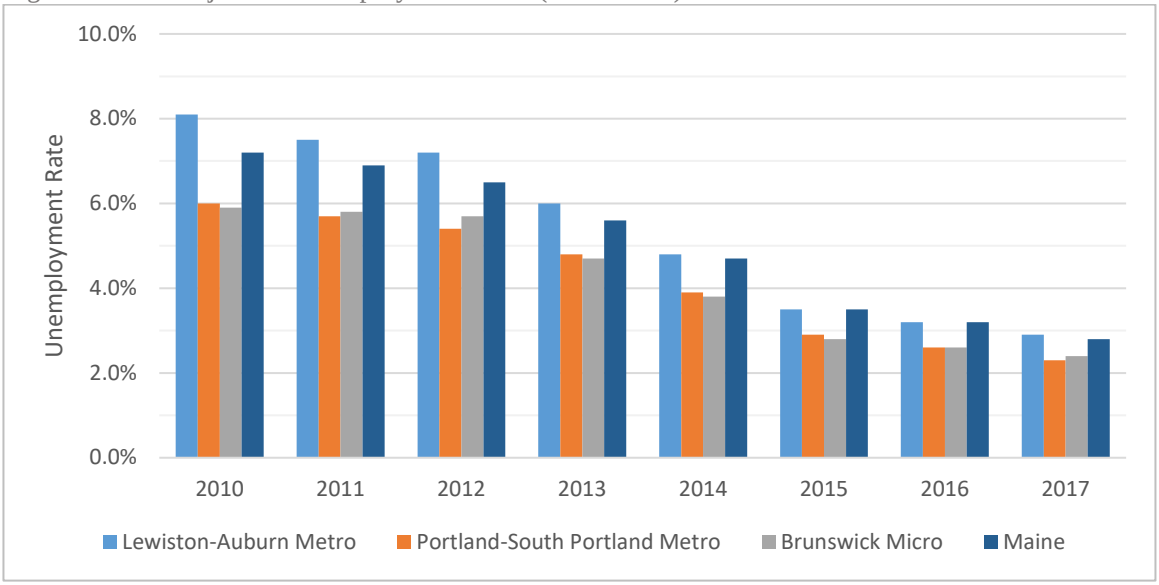
While the unemployment rate for residents within each of these geographies has declined substantially since the 2008 recession, the Lewiston-Auburn Metro, as well as the State of Maine, have not recovered as swiftly as the two areas currently serviced by the Downeaster. The unemployment rate for residents of the Lewiston-Auburn Metro has been consistently higher than for those living in Portland-South Portland and Brunswick and has historically been greater than the statewide rate. As a potential passenger rail service would provide an additional means for residents of each of these areas to access employment opportunities elsewhere, the potential service could assist Lewiston and Auburn residents in achieving the same level of economic security that has been experienced by residents of the Downeaster communities of Portland-South Portland and Brunswick.

Table 9 Unadjusted Employment Rate (2010, 2013, and 2016)

	Unemployment Rate			Change	
	2010	2013	2016	2010-2016	2013-2016
Lewiston-Auburn Metro	8.1%	6.0%	3.2%	-64.2%	-25.9%
Portland - South Portland Metro	6.0%	4.8%	2.6%	-61.7%	-20.0%
Brunswick Micro	5.9%	4.7%	2.6%	-59.3%	-20.3%
Maine	7.2%	5.6%	3.2%	-61.1%	-22.2%

Source: Maine Department of Labor/Center for Workforce Research and Information

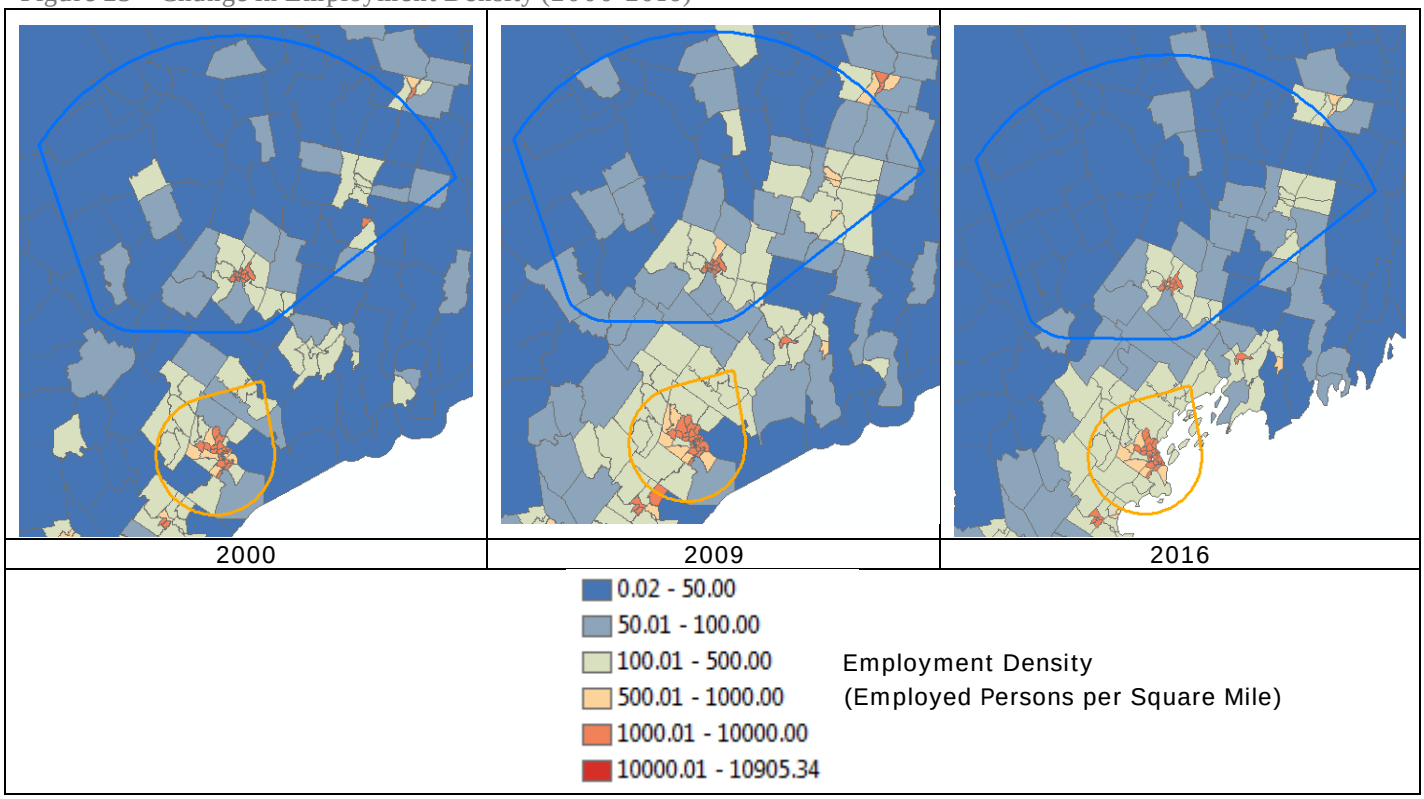
Figure 22 Unadjusted Unemployment Rate (2010-2017)



Source: Maine Department of Labor/Center for Workforce Research and Information

Census data regarding employment density within the various geographies for 2000, 2009, and 2016 is summarized in Figure 23. Between 2000 and 2016, the employment density within the urban cores of Lewiston-Auburn, Portland, and Brunswick remained consistently high with at least 1,000 employed residents per square mile while the outlying portions of these areas have experienced fluctuations in both directions. The employment density within the outer portions of the Portland area continued to increase from 2000 to 2016, mirroring the overall trend noted previously for population – employment density has steadily increased along the north-south corridor linking Lewiston-Auburn to Portland. This trend reaffirms the notion that the economic ties between the two travel markets have strengthened since 2000.

Figure 23 Change in Employment Density (2000-2016)



Source: US Census Bureau – 2000 Decennial Census; 2005-2009 and 2012-2016 American Community Survey 5-Year Estimates

3.5.2 Employment Projections

Employment forecasts for the Northern Study Area and the Southern Study Area in 2010 and 2040 from the Maine STDM are provided in Table 10 and Figure 24. It should be noted that, unlike the statistics offered by the Maine Department of Labor and the US Census Bureau, which correspond to employed residents (i.e., workers), these figures reflect the number of employment opportunities anticipated to be available within these geographies (i.e., jobs).

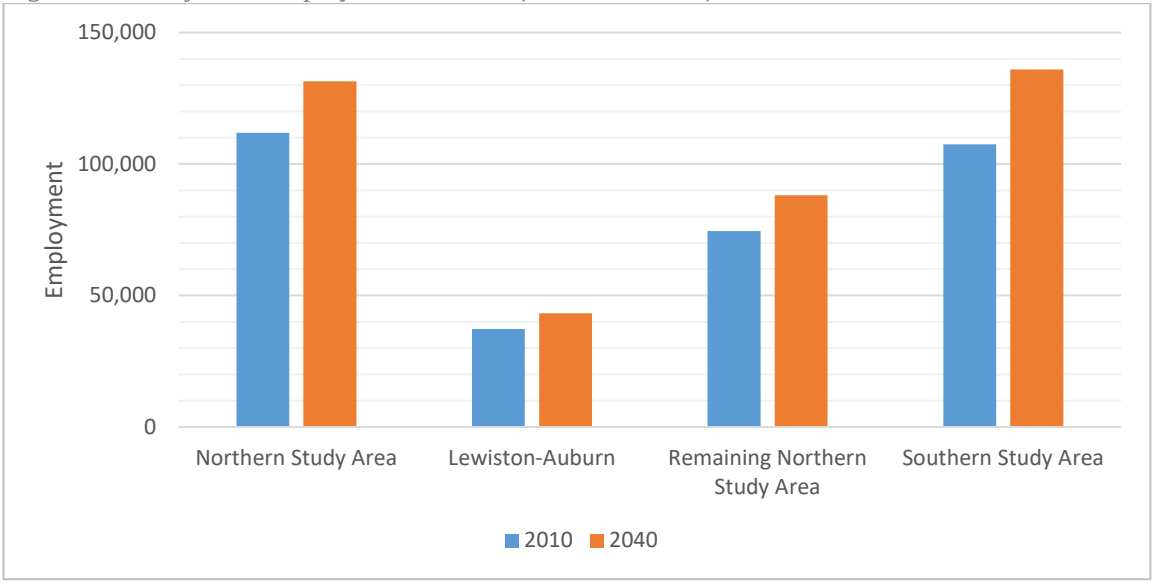
The Northern Study Area is expected to add over 19,500 jobs over the 30-year period (18 percent growth), including approximately 200 additional jobs per year (16 percent growth) in Lewiston-Auburn alone. It should be noted that employment opportunities are projected to grow at nearly twice the rate of population within the Lewiston-Auburn core. Similar to the historical trends described previously, the Southern Study Area is anticipated to grow at a faster rate (27 percent), resulting in an average of approximately 1,600 new jobs per year (22 percent growth) across the two travel markets combined through 2040. Thus, a potential passenger rail service will better enable residents of both travel markets to connect to these emerging employment opportunities, particularly allowing Northern Study Area residents to leverage the robust economic growth of the Southern Study Area.

Table 10 Projected Employment Growth (2010 and 2040)

	Employment		Change	
	2010	2040	Absolute	Percent
Northern Study Area	111,823	131,395	19,572	17.5%
Lewiston-Auburn	*37,264*	*43,274*	*6,010*	*16.1%*
Remaining Northern Study Area	*74,559*	*88,121*	*13,562*	*18.2%*
Greater Portland	107,437	135,977	28,540	26.6%
Total	219,260	267,372	48,112	21.9%

Source: Maine STDM

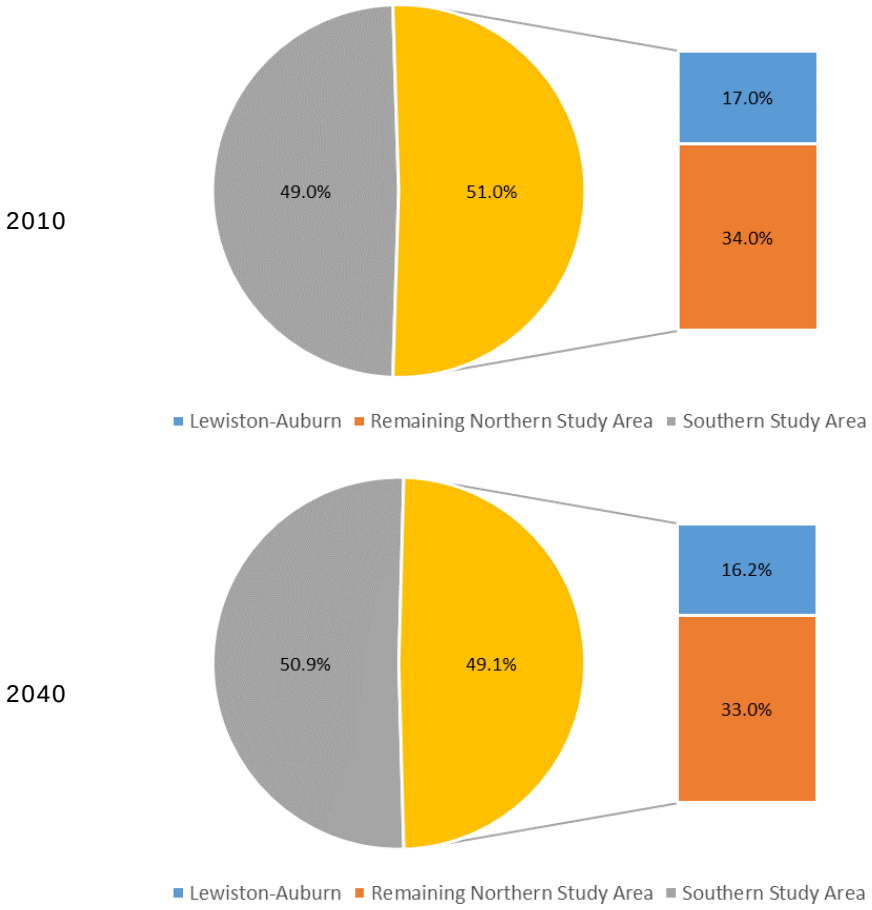
Figure 24 Projected Employment Growth (2010 and 2040)



Source: Maine STDM

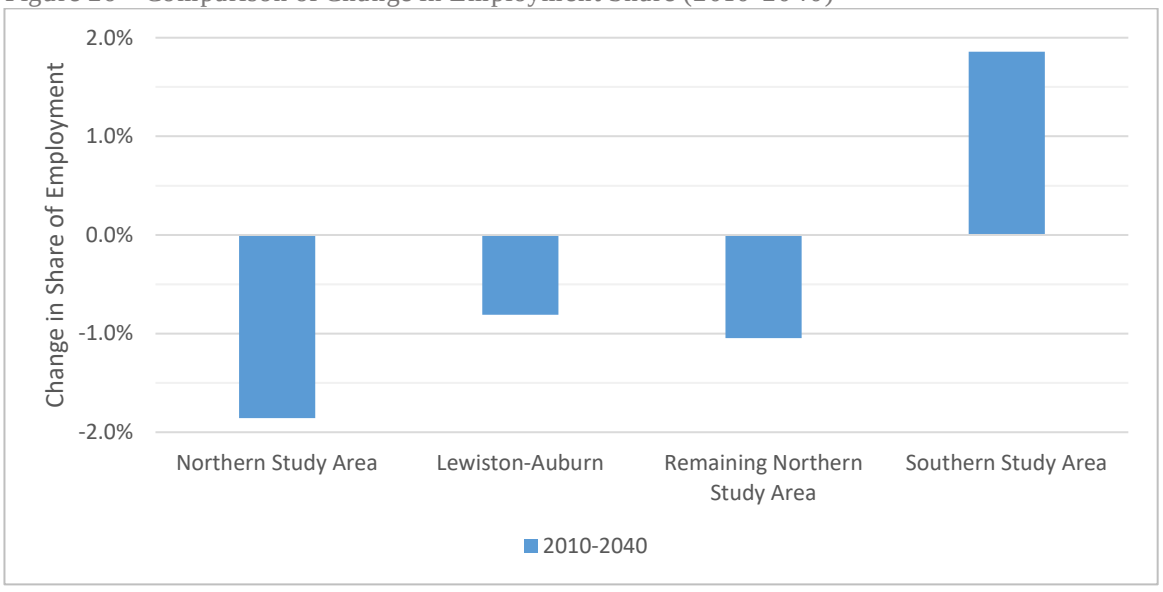
The share of the overall forecast employment in 2010 and 2040 for Lewiston-Auburn, the remaining Northern Study Area, and the Southern Study Area is presented in Figure 25 and the change in each geography's share of total employment from 2010 to 2040 is provided in Figure 26. The Maine STDM projects that in 2040 the Northern Study Area's share of total employment between the two travel markets will decrease by approximately two percent, resulting in Lewiston-Auburn and the remaining Northern Study Area housing 16 percent and 33 percent, respectively, of the available jobs within the two travel markets. The anticipated decrease of the Northern Study Area's share of total employment opportunities within the two travel markets further demonstrates that additional transportation options between Lewiston-Auburn and Portland, such as the potential passenger rail service, would contribute to maintaining or increasing economic security and quality of life for Northern Study Area residents.

Figure 25 Comparison of Employment Share (2010 and 2040)



Source: Maine STDM

Figure 26 Comparison of Change in Employment Share (2010-2040)



Source: Maine STDM

The projected employment within the two travel markets by industry in 2010 and 2040 is presented in Table 11 and Figure 27.

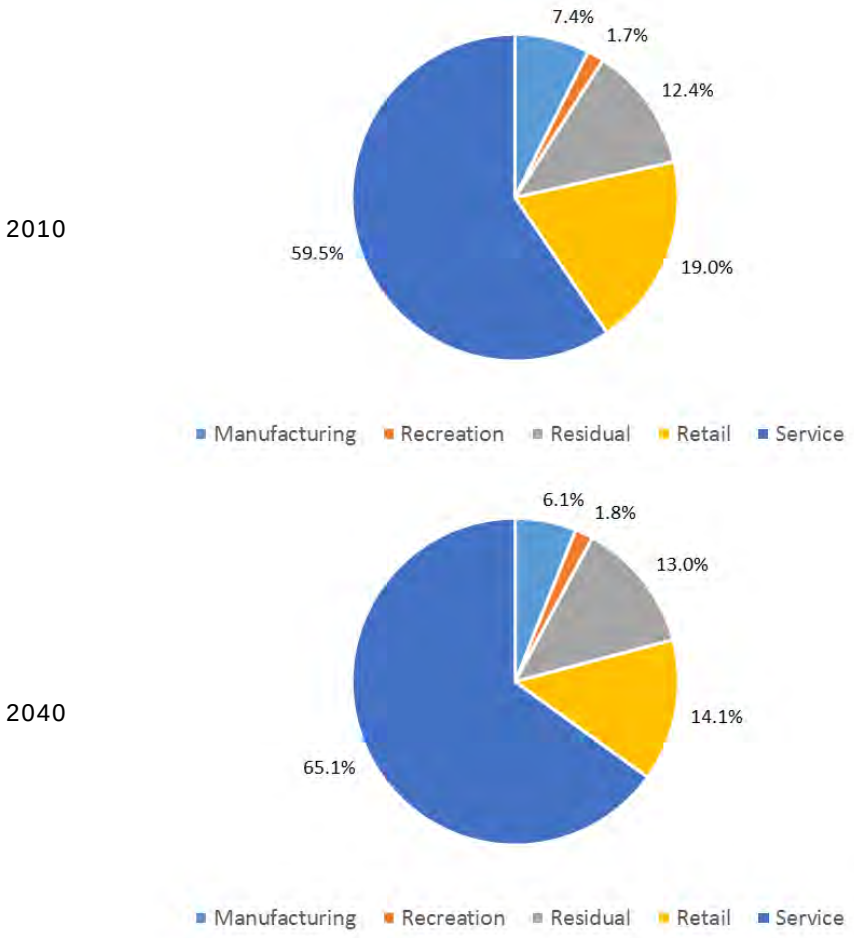
Across the two travel markets, significant job growth is expected within the Service sector, as well as modest growth within the Residual (i.e., all sectors outside of Manufacturing, Recreation, Retail, or Service) and Recreation sectors. In terms of the change in the share of employment within each industry between 2010 and 2040, significant growth within the Service sector is counterbalanced by a significant decline in Retail jobs and a moderate reduction in Manufacturing jobs, as depicted in Figure 28. Jobs within the Service industry typically generate more trips than those within the other sectors. Thus, transportation demand between the two travel markets is likely to experience a relative increase in trip making that exceeds the level that would otherwise be experienced due to the same level of projected growth in total employment over the 30-year period if the distribution of jobs by industry were to remain consistent with that of 2010.

Table 11 Projected Employment Growth by Industry (2010 and 2040)

	Employment		**Change**		
	2010	2040	Absolute	Percentage	Share
Manufacturing	16,253	16,214	(39)	-0.2%	-1.3%
Recreation	3,664	4,774	1,110	30.3%	0.1%
Residual	27,171	34,856	7,685	28.3%	0.6%
Retail	41,665	37,595	(4,070)	-9.8%	-4.9%
Service	130,507	173,933	43,426	33.3%	5.5%
Total	219,260	267,372	48,112	21.9%	0.0%

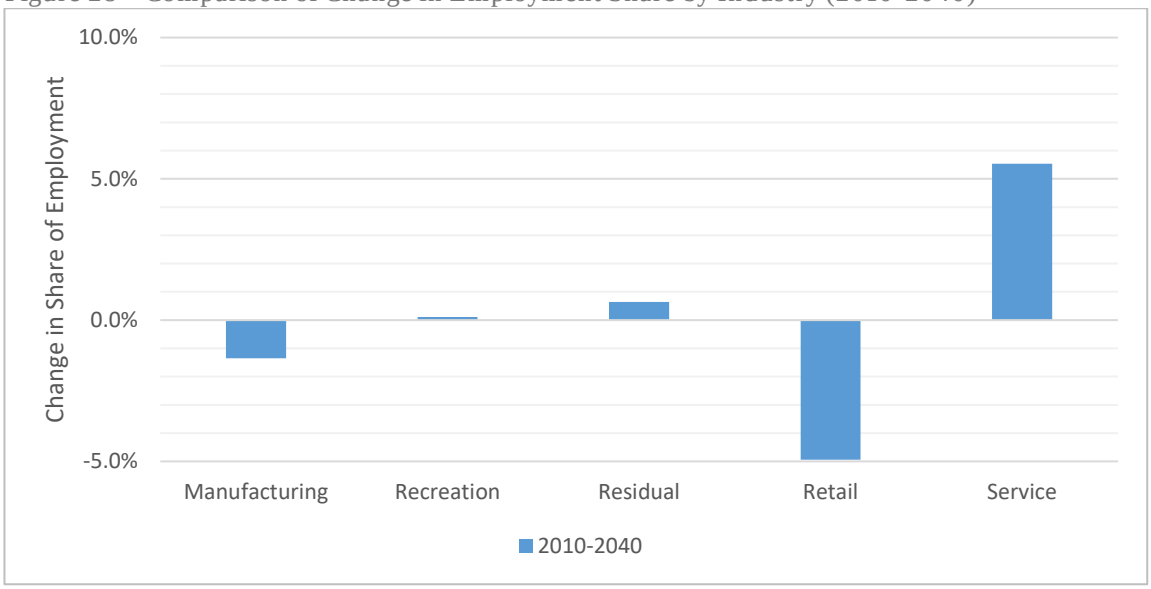
Source: Maine STDM

Figure 27 Comparison of Employment by Industry (2010 and 2040)



Source: Maine STDM

Figure 28 Comparison of Change in Employment Share by Industry (2010-2040)



Source: Maine STDM

3.6 Other Socio-Demographic Trends

In addition to the total number of residents and jobs located within the two travel markets, other socio-demographic factors have the potential to exert an influence on travel demand between the two markets. Historical statistics regarding median age and housing costs were retrieved from the US Census Bureau to understand how aging and housing affordability have changed over time across the two travel markets.

3.6.1 Median Age

The median age in 2000, 2009, and 2016 for the Northern Study Area, the Southern Study Area, the three counties, and the State of Maine are provided in Table 12 and Figure 29.

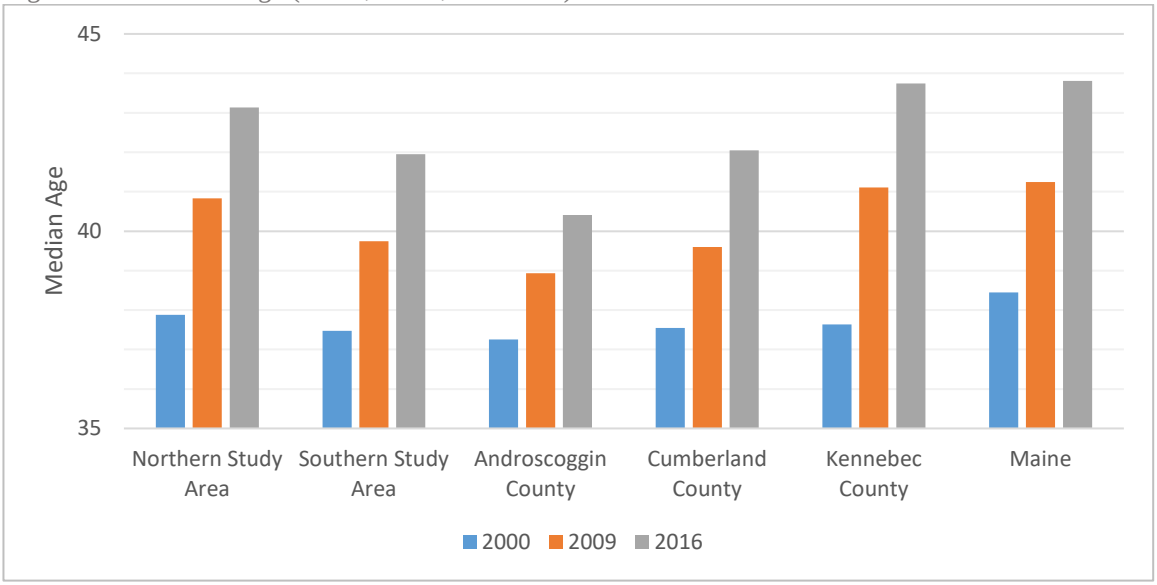
The variation in the median age of residents living within the various geographies increased over time, with a difference of 1.1 years in 2000, 2.3 years in 2009, and 3.4 years in 2016, with Androscoggin County consistently having the lowest median age among the three counties. The median age of residents within the Northern Study Area was consistently higher than those living in the Southern Study Area and tracked closely with the relatively high statewide median age. Although residents of the Lewiston-Auburn and Portland core areas were typically younger than those living in the outer portions, Figure 29 exhibits an overall increase in the median age of those living within the two travel markets between 2000 and 2016. As residents age, the provision of additional transportation options, such as the potential passenger rail service, offers those with diminishing interest in or reduced ability to drive between the two travel markets another means to address their mobility needs.

Table 12 Median Age (2000, 2009, and 2016)

	Median Age			Change	
	2000	2009	2016	2000-2016	2009-2016
Northern Study Area	37.9	40.8	43.1	13.9%	5.6%
Southern Study Area	37.5	39.7	42.0	12.0%	5.5%
Androscoggin County	37.3	38.9	40.4	8.5%	3.8%
Cumberland County	37.5	39.6	42.0	12.0%	6.2%
Kennebec County	37.6	41.1	43.7	16.2%	6.4%
Maine	38.4	41.2	43.8	14.0%	6.2%

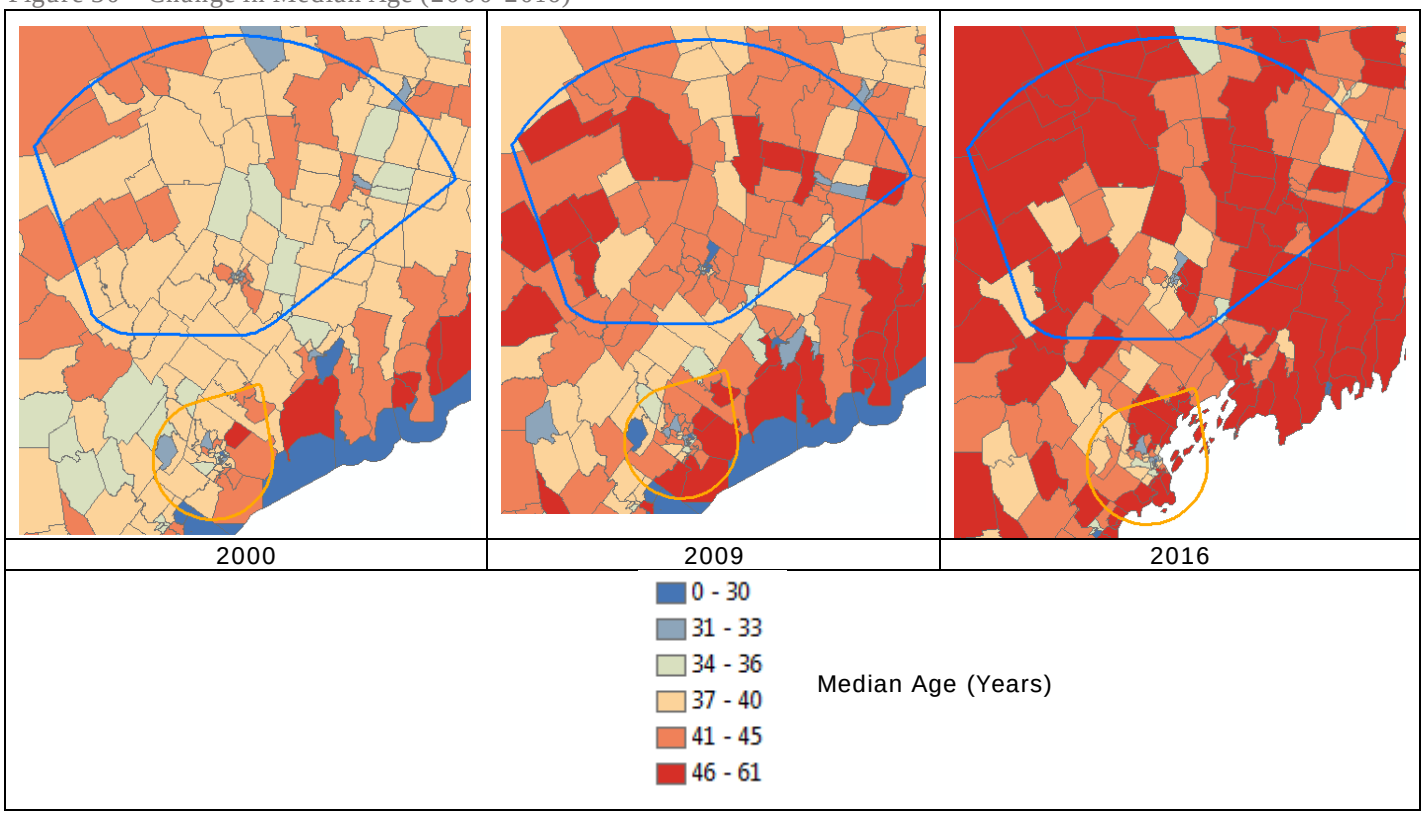
Source: US Census Bureau – 2000 Decennial Census; 2005-2009 and 2012-2016 American Community Survey 5-Year Estimates

Figure 29 Median Age (2000, 2009, and 2016)



Source: US Census Bureau – 2000 Decennial Census; 2005-2009 and 2012-2016 American Community Survey 5-Year Estimates

Figure 30 Change in Median Age (2000-2016)



Source: US Census Bureau – 2000 Decennial Census; 2005-2009 and 2012-2016 American Community Survey 5-Year Estimates

3.6.2 Housing Costs

Median values for owner-occupied housing units within the various geographies in 2000 and 2016, as well as the absolute change in value and the 2016 price of a median home in other geographies relative to the Northern Study Area, are presented in Table 13. The cost of owner-occupied housing within the Northern Study Area was low in both 2000 and 2016 relative to the Southern Study Area, Cumberland County, and the State of Maine, and slightly above the values in Kennebec and Androscoggin Counties, as shown in Figure 31. In terms of the percentage change in median home value from 2000 to 2016, the Northern Study Area experienced the second lowest percentage growth in owner-occupied housing values at 73 percent compared to an 85 and 93 percent increase in the Southern Study Area and Cumberland County, respectively, as demonstrated in Figure 32.

As seen in Figure 33, between 2009 and 2016 the median home values within the Southern Study Area, as well as the area located between the Northern and Southern Study Areas, continued to experience significant increases while the change in home values within the Northern Study Area resulted in only minor changes to the order of magnitude costs for Census blocks located northeast of the Lewiston-Auburn core. In 2016, the median value of owner-occupied homes in the Southern Study Area and Cumberland County was approximately 60 and 59 percent higher, respectively, than the Northern Study Area, as shown in Figure 34.

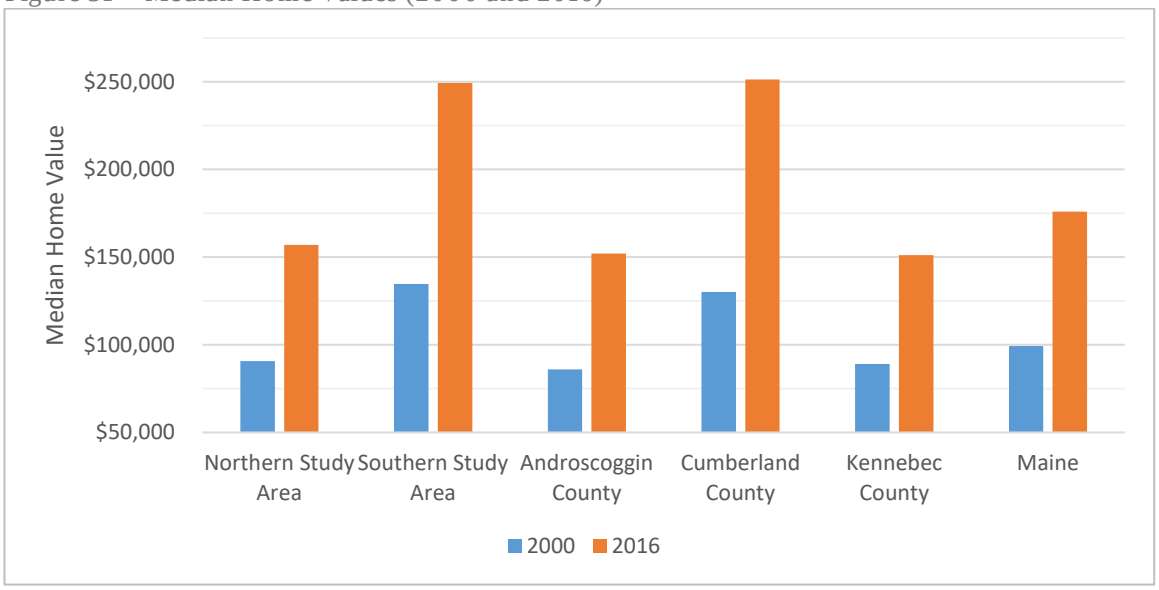
Thus, given the relatively lower median home values and the reduced rate of price increase, home ownership opportunities are more likely to be economically accessible for those seeking properties located north of the Portland area (either within the Northern Study Area, Androscoggin County, or Kennebec County) than those looking to purchase a home within the Southern Study Area or Cumberland County.

Table 13 Median Home Values (2000 and 2016)

	Median Home Value		Change	Relative Price
	2000	2016	2000-2016	2016
Northern Study Area	$90,621	$156,927	73.2%	0.0%
Southern Study Area	$134,680	$249,253	85.1%	58.8%
Androscoggin County	$86,001	$152,100	76.9%	-3.1%
Cumberland County	$130,158	$251,300	93.1%	60.1%
Kennebec County	$89,150	$151,100	69.5%	-3.7%
Maine	$99,253	$176,000	77.3%	12.2%

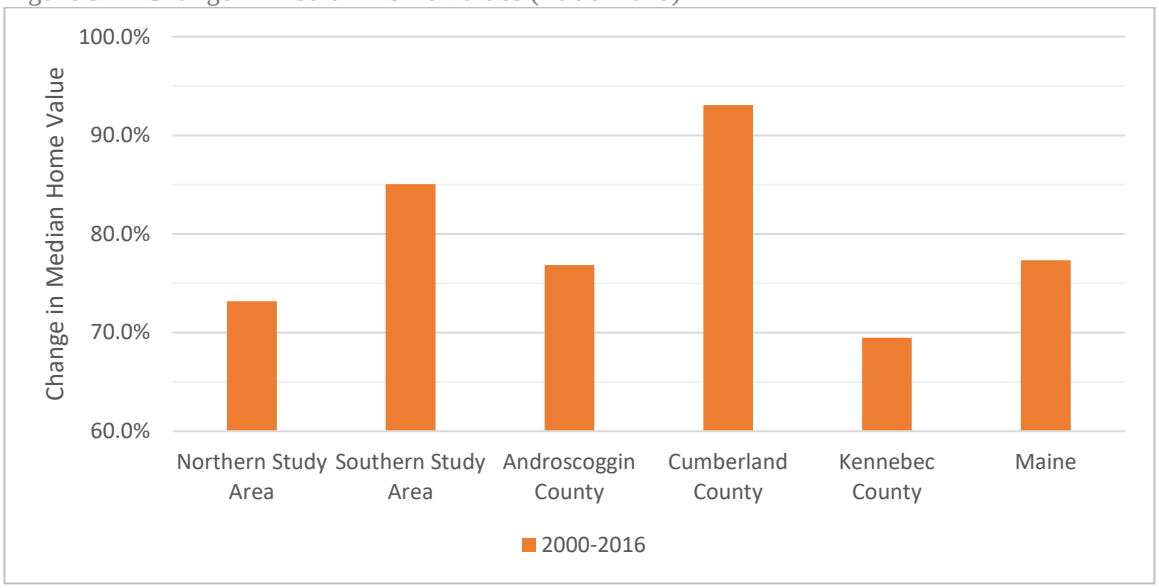
Source: US Census Bureau – 2000 Decennial Census; 2005-2009 and 2012-2016 American Community Survey 5-Year Estimates

Figure 31 Median Home Values (2000 and 2016)



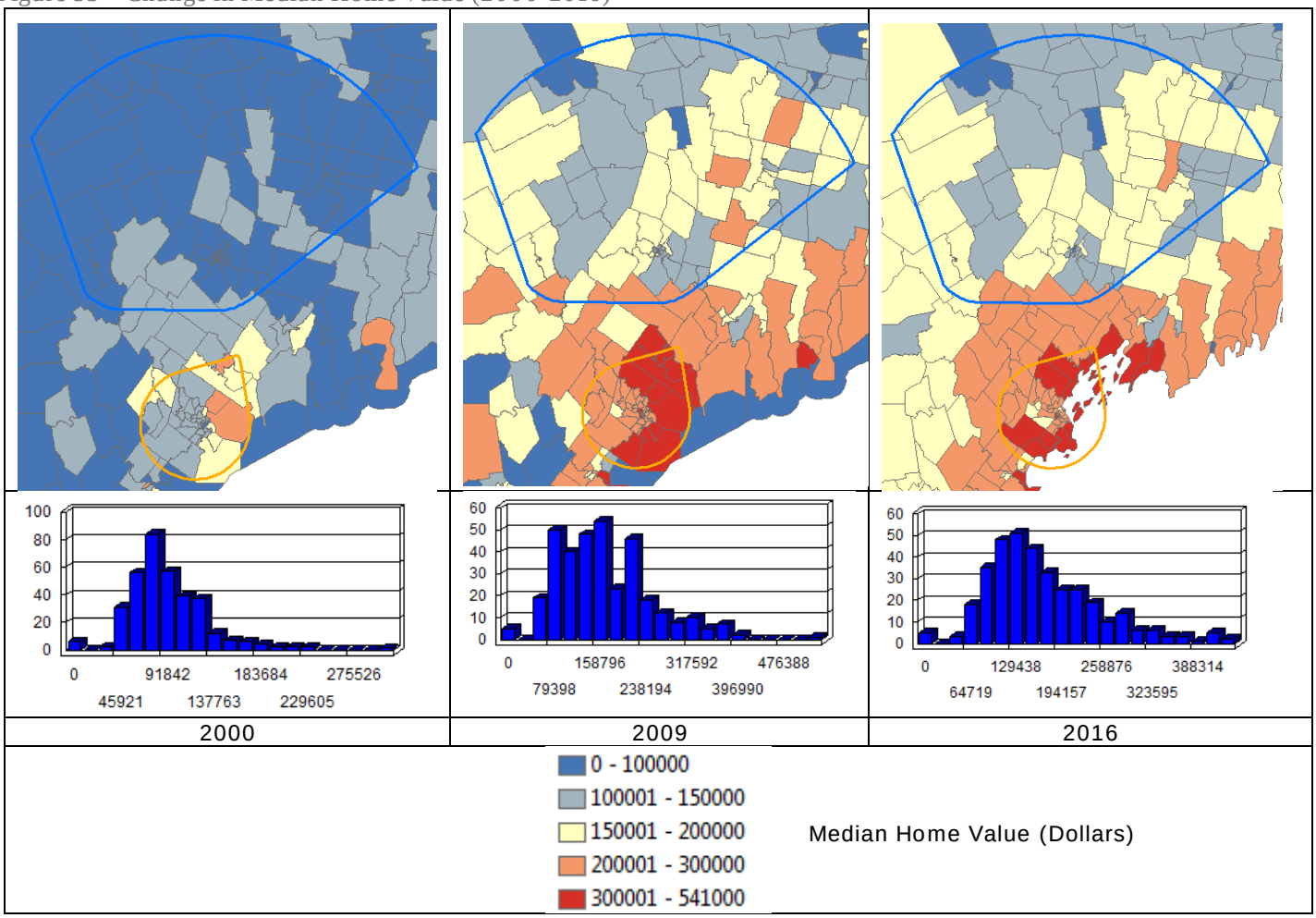
Source: US Census Bureau – 2000 Decennial Census and 2012-2016 American Community Survey 5-Year Estimates

Figure 32 Change in Median Home Values (2000-2016)



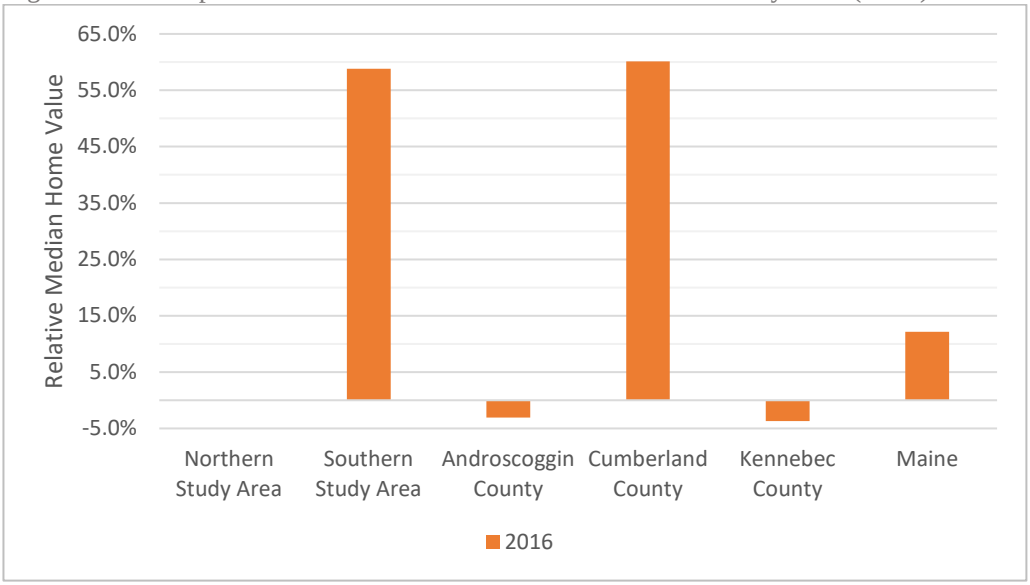
Source: US Census Bureau – 2000 Decennial Census and 2012-2016 American Community Survey 5-Year Estimates

Figure 33 Change in Median Home Value (2000-2016)



Source: US Census Bureau – 2000 Decennial Census and 2012-2016 American Community Survey 5-Year Estimates

Figure 34 Comparison of Median Home Values Relative to Study Area (2016)



Source: US Census Bureau – 2012-2016 American Community Survey 5-Year Estimates

The average cost of renting a housing unit and covering utilities (i.e., gross rent) within each of the geographies is presented in Table 14 and Figure 35. Echoing the home ownership trend described above, the cost of renting in the Northern Study Area is dramatically lower than renting in the Southern Study Area or Cumberland County. Relative to renting a unit within the Northern Study Area, rental units in areas to the south are likely to cost approximately 36 percent more, as shown in Figure 36.

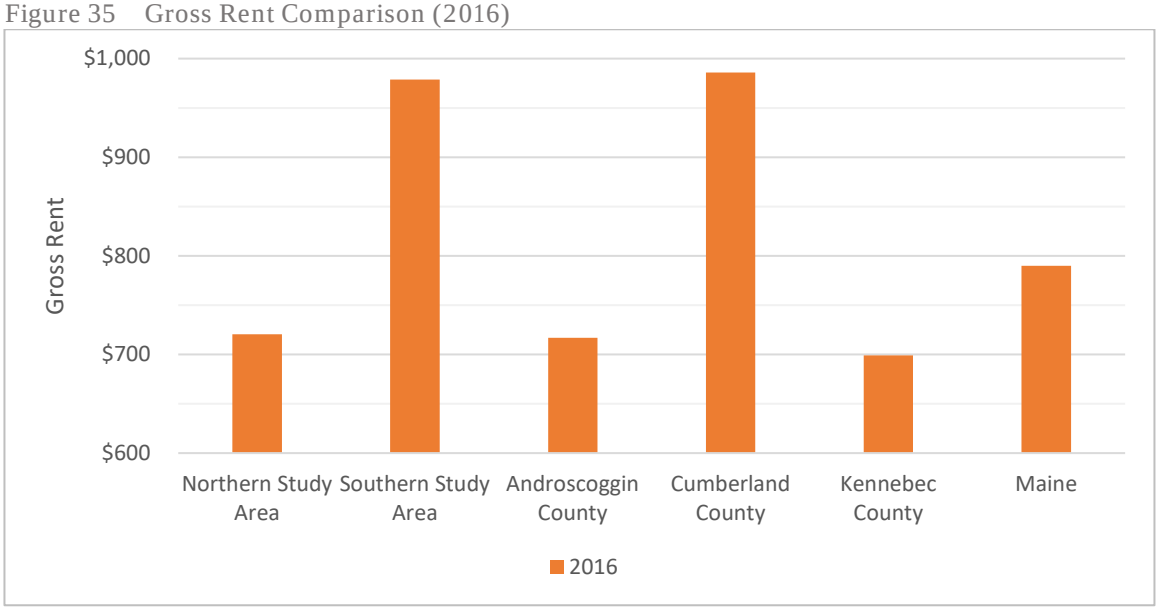
Regardless of whether a household is seeking to own or rent, housing costs within the Northern Study Area and other geographies located north of the Southern Study Area and Cumberland County are relatively more affordable. As housing cost increases in metropolitan areas throughout the country continue to outpace increases in household income, the relatively high cost of living within or adjacent to regional employment centers like Portland is likely to increase demand for affordable housing options in outlying areas, particularly those areas with strong connectivity to the job centers. Given that a potential passenger rail service would provide Northern Study Area residents within the opportunity to commute to Portland via train, there is strong potential for the Northern Study Area to experience additional population and employment growth as it begins to function more like a “bedroom” community or commuter suburb of Portland.

Table 14 Gross Rent Comparison (2016)

	Gross Rent	Relative Rent
Northern Study Area	$721	0.0%
Southern Study Area	$979	35.8%
Androscoggin County	$717	-0.5%
Cumberland County	$986	36.8%
Kennebec County	$699	-3.0%
Maine	$790	9.6%

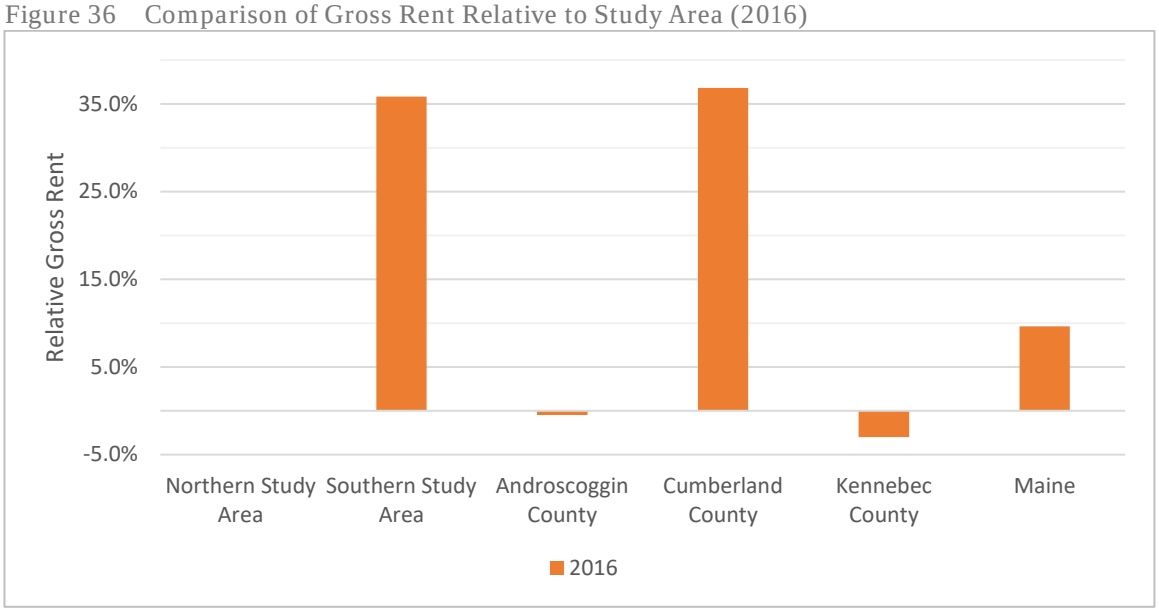
Source: US Census Bureau – 2012-2016 American Community Survey 5-Year Estimates

Figure 35 Gross Rent Comparison (2016)



Source: US Census Bureau – 2012-2016 American Community Survey 5-Year Estimates

Figure 36 Comparison of Gross Rent Relative to Study Area (2016)



Source: US Census Bureau – 2012-2016 American Community Survey 5-Year Estimates

3.7 Major Employers

Major employers (also known as major trip generators) are organizations or businesses that employ a large number of people in the L-A and Portland areas. Major employers are important to study because they generate a large number of trips to their facility, some of which could potentially be captured on a passenger rail service.

Major employers (defined as employers with 100 or more employees) were identified for a 5-mile radius in Portland and Lewiston-Auburn. In Portland, this 5-mile radius was centered around the Portland Transportation Center, the stop for existing Downeaster service in Portland. In Lewiston-Auburn, the search was conducted within a 5-mile radius of a point midway between the Lewiston and Auburn downtowns.

In the 5-mile radius of the Portland Transportation Center, 102 major trip generators were identified. The top 10 major employers in the Southern Study Area are shown in Table 15. These top 10 major employers, along with the rest of the major trip generators that were identified, are mapped in Figure 37. A complete list of the major employers identified in the Southern Study Area are included in Appendix B.

Table 15 Top 10 Employers within 5 miles of Portland Transportation Center

Company Name	Street	City	Zip Code	Number of Employees
Unum	Congress St	Portland	04102	3,000
City of Portland	Congress St	Portland	04101	1,600
Mercy Hospital of Portland	State St	Portland	04101	1,225
Martinspoint Healthcare	Veranda St	Portland	04103	800
Wright Express	Gorham Rd	South Portland	04106	600
Ciee	Fore St	Portland	04101	501
Spring Harbor Hospital	Andover Rd	Westbrook	04092	500
Sappi Fine Paper North America	Cumberland St	Westbrook	04092	491
Southern Maine Community Clg	Fort Rd	South Portland	04106	400
TD Bank	Portland Sq	Portland	04101	400

Source: ESRI Business Analyst

In the 5-mile radius of between the Lewiston and Auburn downtowns, 42 major trip generators were identified. The top 10 major employers in the Northern Study Area are shown in Table 16. These top 10 major employers, along with the rest of the major trip generators that were identified, are mapped in Figure 38. A complete list of the major employers identified in the Northern Study Area are included in Appendix B.

Table 16 Top 10 Employers within 5 miles of Lewiston and Auburn Downtowns

Company Name	General Address	City	Zip Code	Number of Employees
St Marys Hospital	Campus Ave	Lewiston	04240	2,000
Central Maine Medical Ctr	Main St	Lewiston	04240	2,566
Td Bank	Chestnut St	Lewiston	04240	994
Bates College	Andrews Rd	Lewiston	04240	839
Walmart Distribution Center	Alfred A Plourde Pkwy	Lewiston	04240	807
Pionite Decorative Surfaces	Pionite Rd	Auburn	04210	500
Mc Kesson Corp	Mollison Way	Lewiston	04240	467
Lepage Bakery	Lisbon St	Lewiston	04240	300
Carbonite	Mollison Way	Lewiston	04240	253
Geiger Bros	Mount Hope Ave	Lewiston	04240	243

Source: ESRI Business Analyst and City of Lewiston

0 0.5 1 Miles

Top 10 Major Employers

★ 400 - 749 Employees

★ 750 - 1,499 Employees

★ 1,500 - 3,000 Employees

● Remaining Major Employers (100 or more Employees)

● Portland Transportation Center (Centroid of Buffer)

▭ 5-Mile Buffer

LEWISTON-AUBURN PASSENGER RAIL SERVICE PLAN

Major Employers within Five Miles of Portland Transportation Center

Source: ESRI Business Analyst

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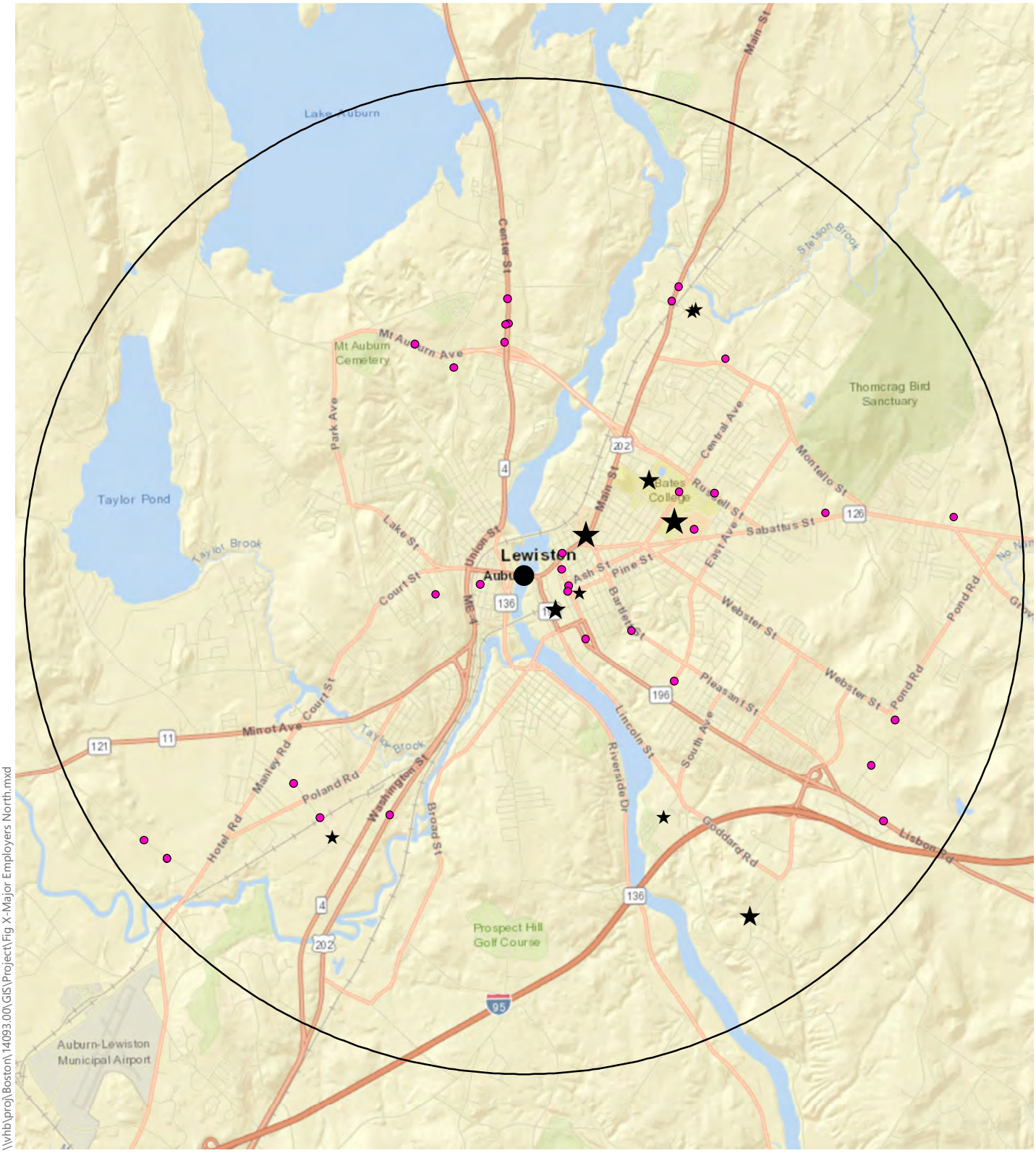

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0 0.5 1 Miles

Top 10 Employers

★ 240 - 749 Employees

★ 750 - 1,499 Employees

★ 1,500 - 2,566 Employees

Major Employers (100 or more Employees)

Centroid of Buffer

5-Mile Buffer

LEWISTON-AUBURN PASSENGER RAIL SERVICE PLAN

Major Employers within Five Miles of Lewiston and Auburn Downtowns

Source: ESRI Business Analyst, City of Lewiston

3.8 Journey to Work Data

To understand the magnitude and direction of commute trips between the Northern Study Area, the Southern Study Area, and other regions within southern Maine and along Amtrak's Downeaster corridor, journey to work data was obtained from the US Census Bureau's 2009-2013 ACS 5-Year estimates and the 2015 Longitudinal Employer-Household Dynamics (LEHD) dataset. This data can be used to determine potential demand for commute-based trips between Androscoggin County / Lewiston-Auburn and other nearby labor markets.

3.8.1 County-to-County Flows

County-to-county tabulations of commute trips are presented in Table 17 through Table 19 based on data retrieved from the US Census Bureau's 2009-2013 ACS 5-year estimates. In 2013, the Census recorded over 47,000 commute trips by workers residing in Androscoggin County. Although the majority of the Androscoggin-based commute trips were internal to the county (78 percent), approximately 15 percent were destined for Cumberland County to the south. For commutes that cross state boundaries, approximately 0.4 percent and 0.3 percent of 2013 Androscoggin-based work trips were destined for locations within New Hampshire and Massachusetts, respectively, compared to 0.6 percent and 0.8 percent of 2013 Cumberland-based work trips.

In 2013, the Census recorded approximately 46,500 commute trips taken by workers residing in Androscoggin County. While the majority of the Androscoggin-bound commute trips were completed by residents within the county (79 percent), approximately eight percent, seven percent, and six percent of workers destined for jobs in Androscoggin County originated from Oxford, Cumberland, and Kennebec Counties, respectively. For commutes that cross state boundaries, approximately 15 percent of workers coming from New Hampshire to work in southern Maine, along with 10 percent of workers coming from Massachusetts to work in southern Maine, report to work sites within Androscoggin County, compared to 75 percent and 87 percent that work within Cumberland County.

Thus, there are already strong regional workforce connections between the Northern Study Area, the Southern Study Area, and other major employment centers along the Downeaster corridor.

Table 17 County-to-County Commute Flows (2013)

	DESTINATION COUNTY							
ORIGIN COUNTY	Androscoggin	Kennebec	Oxford	Cumberland	York	NH*	MA**	Origin Total
Androscoggin	36,807	1,675	1,073	7,145	266	177	134	47,277
Kennebec	2,653	45,466	80	1,868	100	109	47	50,323
Oxford	3,612	276	15,544	2,674	464	14	0	22,584
Cumberland	3,406	1,519	1,055	128,513	5,085	877	1,191	141,646
Destination Total	46,478	48,936	17,752	140,200	5,915	1,177	1,372	261,830

Source: US Census Bureau – 2009-2013 American Community Survey 5-Year Estimates

* - Counties within southeastern New Hampshire (Stafford, Rockingham, and Hillsborough)

** - Counties within Greater Boston (Essex, Middlesex, Suffolk, and Norfolk)

Table 18 County-to-County Commute Percentages by Origin County (2013)

	DESTINATION COUNTY							
ORIGIN COUNTY	Androscoggin	Kennebec	Oxford	Cumberland	York	NH*	MA**	Origin Total
Androscoggin	77.9%	3.5%	2.3%	15.1%	0.6%	0.4%	0.3%	100.0%
Kennebec	5.3%	90.3%	0.2%	3.7%	0.2%	0.2%	0.1%	100.0%
Oxford	16.0%	1.2%	68.8%	11.8%	2.1%	0.1%	0.0%	100.0%
Cumberland	2.4%	1.1%	0.7%	90.7%	3.6%	0.6%	0.8%	100.0%

Source: US Census Bureau – 2009-2013 American Community Survey 5-Year Estimates

* - Counties within southeastern New Hampshire (Stafford, Rockingham, and Hillsborough)

** - Counties within Greater Boston (Essex, Middlesex, Suffolk, and Norfolk)

Table 19 County-to-County Commute Percentages by Destination County (2013)

	DESTINATION COUNTY						
ORIGIN COUNTY	Androscoggin	Kennebec	Oxford	Cumberland	York	NH*	MA**
Androscoggin	79.2%	3.4%	6.0%	5.1%	4.5%	15.0%	9.8%
Kennebec	5.7%	92.9%	0.5%	1.3%	1.7%	9.3%	3.4%
Oxford	7.8%	0.6%	87.6%	1.9%	7.8%	1.2%	0.0%
Cumberland	7.3%	3.1%	5.9%	91.7%	86.0%	74.5%	86.8%
Destination Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: US Census Bureau – 2009-2013 American Community Survey 5-Year Estimates

* - Counties within southeastern New Hampshire (Stafford, Rockingham, and Hillsborough)

** - Counties within Greater Boston (Essex, Middlesex, Suffolk, and Norfolk)

3.8.2 Area-to-Area Flows

To augment the county-to-county numbers provided above, the US Census Bureau's 2015 LEHD dataset was used to derive Table 20 which displays a higher level of detail for commuting trips originating from or destined for the Northern Study Area, the Southern Study Area, New Hampshire, and Massachusetts.

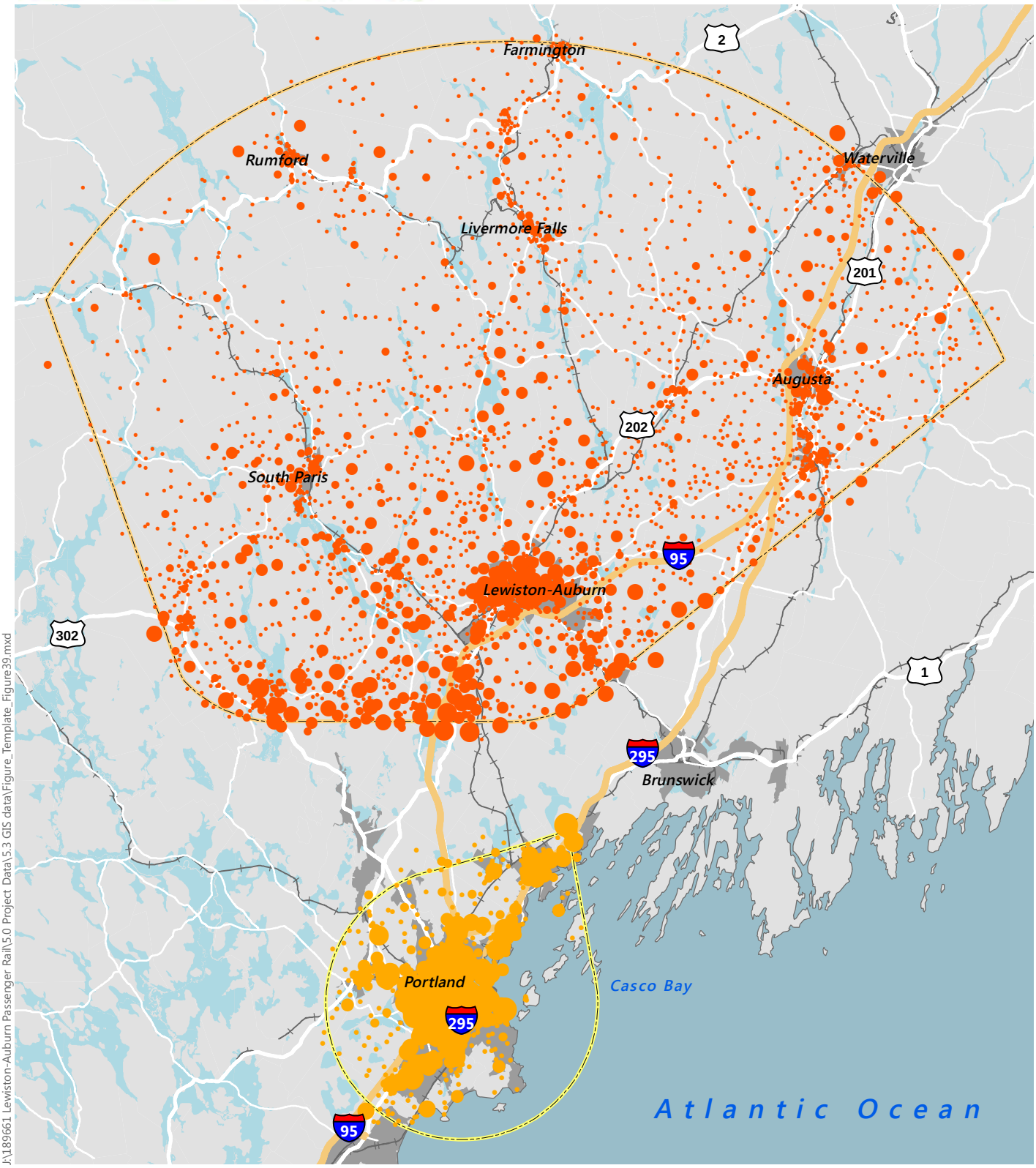
Table 20 Area-to-Area Commute Flows (2015)

		ORIGIN	
		Northern Study Area	Southern Study Area
DESTINATION	Northern Study Area	--	5,125
	Southern Study Area	12,684	--
	MA – Boston	433	384
	MA – Other	990	952
	NH – Dover	352	427
	NH - Other	1,209	598

Source: US Census Bureau – 2015 Longitudinal Employer-Household Dynamics

The 2015 data demonstrate that for approximately every five workers commuting from the Northern Study Area to jobs in the Southern Study Area (Figure 39) there are two workers commuting from the Southern Study Area to employment opportunities in the Northern Study Area (Figure 40). For commute trips from Maine into New Hampshire (Figure 41), there are approximately three workers residing in the Northern Study Area for every two workers residing in the Southern Study Area. Surprisingly, for commute

trips from Maine into Massachusetts (Figure 42), the number of commuters traveling from the Northern Study Area into Massachusetts is quite proximate to the number of commuters headed into Massachusetts from the Southern Study Area. Thus, a potential passenger rail service to Lewiston-Auburn has the potential to serve existing regional workforce connections between the Northern Study Area, the Southern Study Area, New Hampshire, and Massachusetts.



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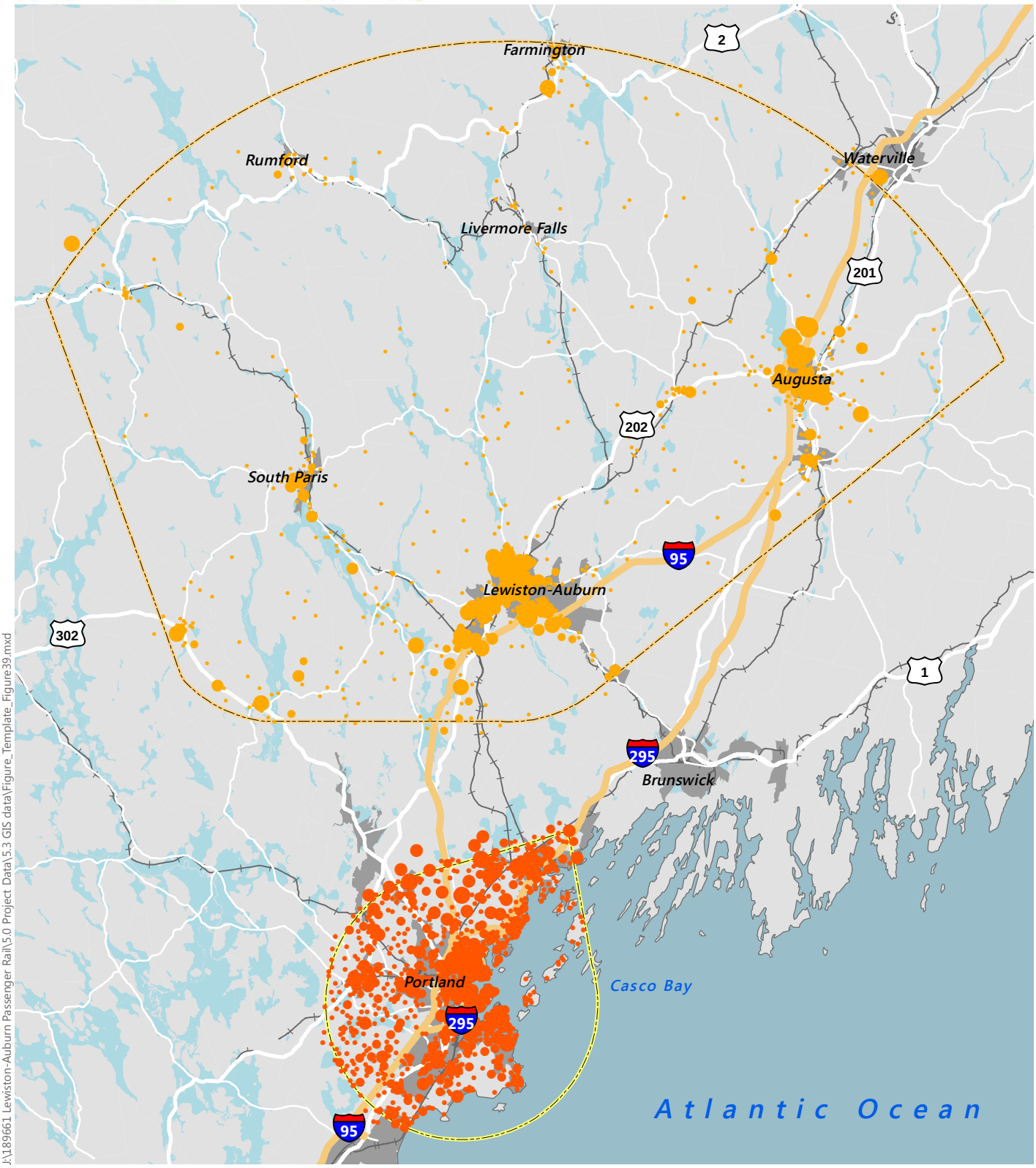
0 5 10 Miles

Work Counts in South Study Area	Resident Counts in North Study Area
1 - 5	1 - 5
6 - 10	6 - 10
11 - 20	11 - 20
21 - 50	21 - 50
51 - 100	51 - 100
101 - 241	101 - 120

LEWISTON-AUBURN
PASSENGER RAIL SERVICE PLAN

Work Trips from North Study Area to South Study Area

Source: US Census Bureau – 2015 Longitudinal Employer-Household Dynamics



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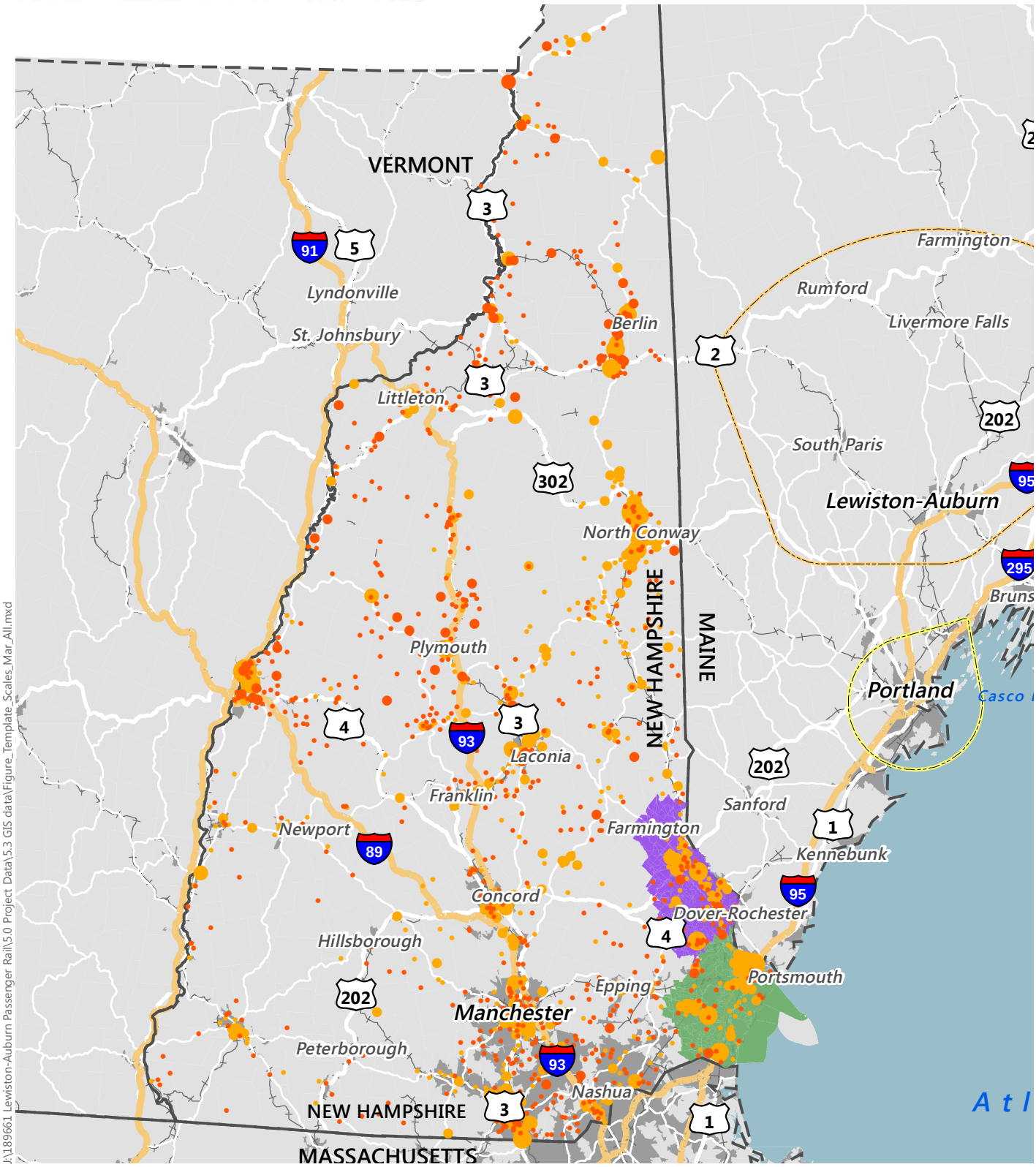
0 5 10 Miles

Work Counts in North Study Area	Resident Counts in South Study Area
1 - 5	1 - 5
6 - 10	6 - 10
11 - 20	11 - 20
21 - 50	21 - 50
51 - 100	51 - 100
101 - 134	101 - 150

LEWISTON-AUBURN PASSENGER RAIL SERVICE PLAN

Work Trips from South Study Area to North Study Area

Source: US Census Bureau – 2015 Longitudinal Employer-Household Dynamics



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0 10 20 Miles

Job Counts in HN

- 1
- 2 - 3
- 4 - 5
- 6 - 10
- 11 - 23

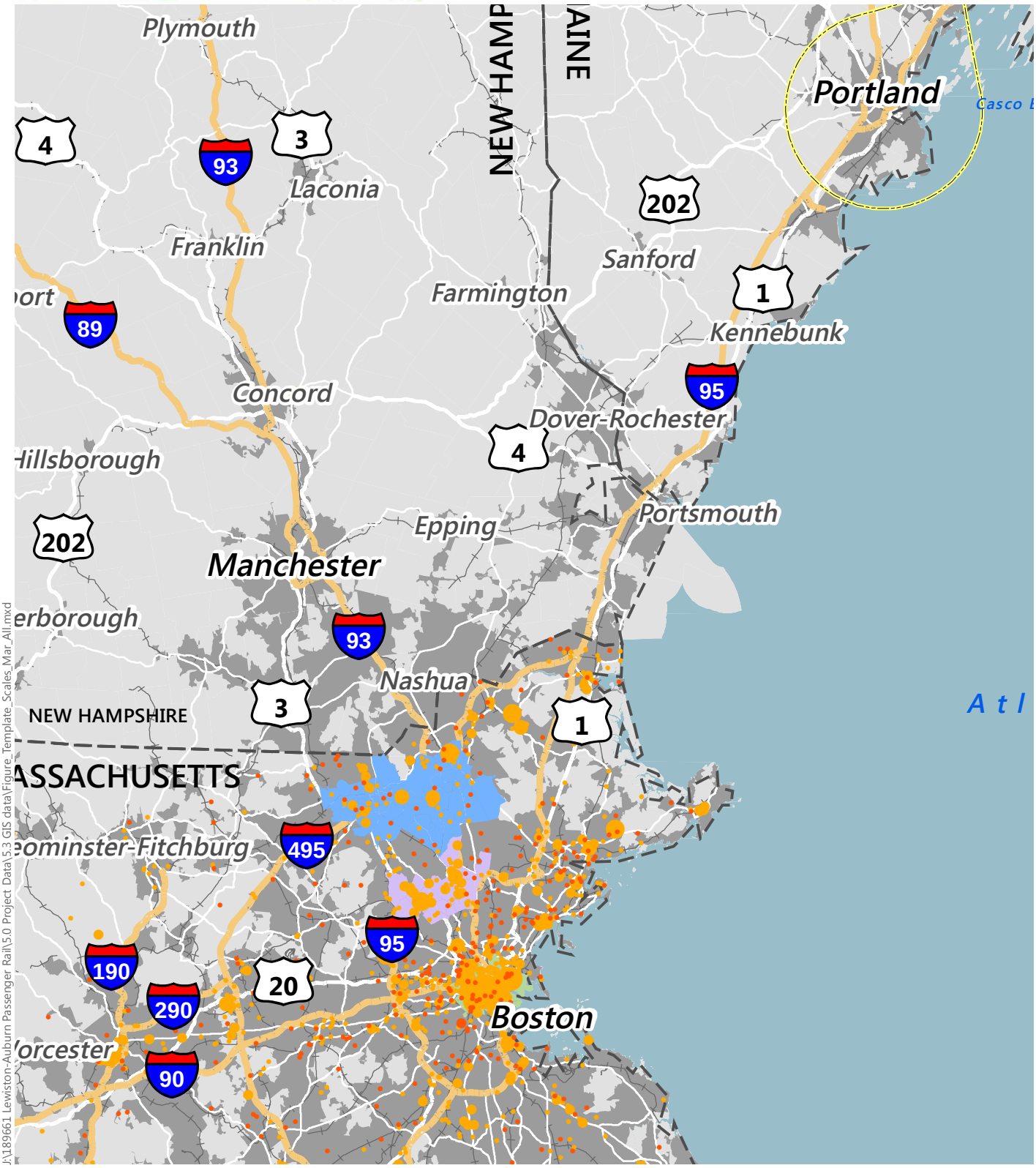
Resident Counts in NH

- 1
- 2 - 3
- 4 - 5
- Dover-Rochester
- Portsmouth

LEWISTON-AUBURN
PASSENGER RAIL SERVICE PLAN

Work Trips between North Study Area and New Hampshire

Source: US Census Bureau – 2015 Longitudinal Employer - Household Dynamics



0 7 14 Miles

Job Counts in MA	Resident counts in MA
1	1
2 - 3	2
4 - 5	Boston Area
6 - 10	MA Burlington Area
11 - 40	MA North Area

LEWISTON-AUBURN
PASSENGER RAIL SERVICE PLAN

Work Trips between North Study Area and Massachusetts

Source: US Census Bureau – 2015 Longitudinal Employer - Household Dynamics

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3.9 Downeaster Ridership Data

Downeaster data was also collected and analyzed to better understand the travel patterns of those who are using the Downeaster today. This included:

- Ridership Survey data
- Ridership data by train number
- Ridership data by station
- Ridership data between station pairs

3.9.1 Ridership Survey Data

In 2011, 2012, 2013, and 2016, the Downeaster administered surveys to its passengers to better understand the travel patterns and demographics of its riders, among other things.

This data was examined as part of this study to understand:

- What differences in travel patterns, if any, there are between individuals residing in the Northern Study Area when compared to the dataset as a whole; and
- Whether there has been any change in travel within the Northern Study Area since the survey was first administered.

Each of these is examined in greater detail in respective subsections.

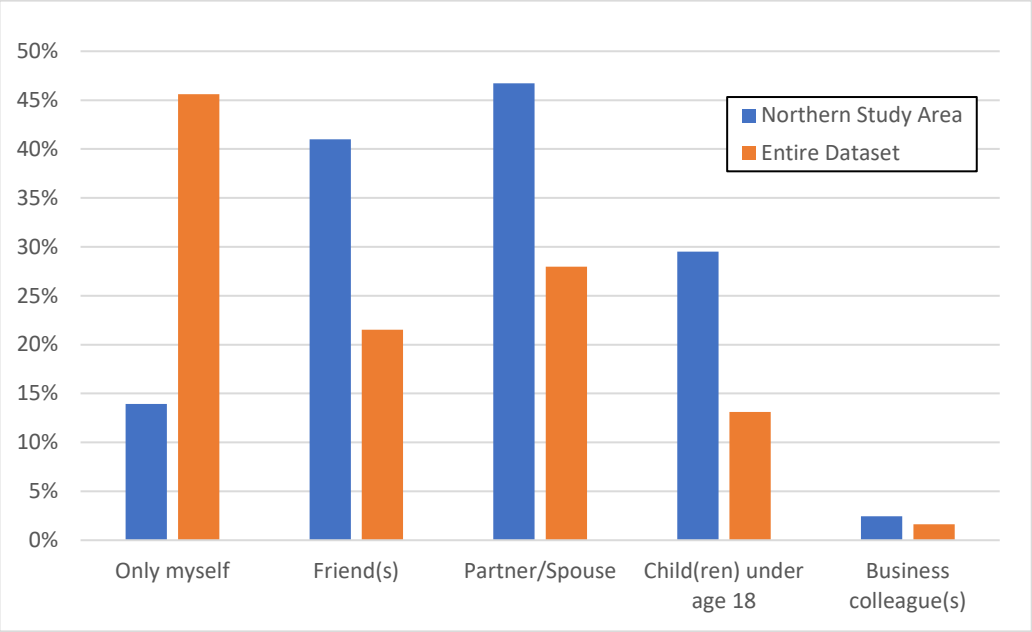
3.9.1.1 Comparison between Northern Study Area and Entire 2016 Dataset

The charts in this subsection summarize the results from the 2016 survey by comparing the responses from individuals residing in the Northern Study Area with the entire dataset. For purposes of this analysis, zip codes provided by respondents were used to determine who resided in the Northern Study Area.

The first survey question examined (presented in Figure 43) asked the survey respondent whom they were traveling with. The survey shows that riders from the Northern Study Area are more likely to travel with someone else.

The next question (presented in Figure 44) asked whether the trip being taken is part of a round trip or one-way trip. The results show Northern Study Area trips are more likely to be round trips, completed in the same day.

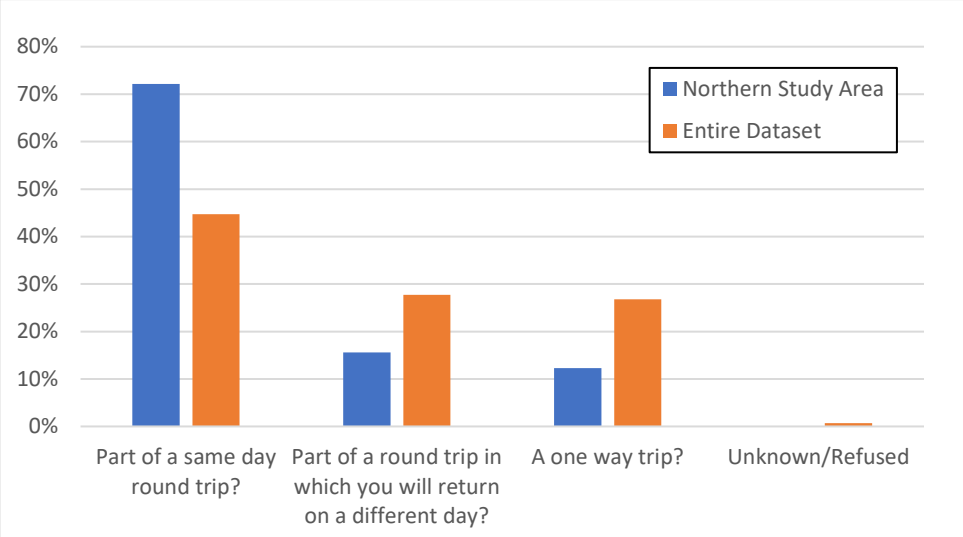
Figure 43 Survey Question: Who are you traveling with today on the Downeaster?



Source: 2016 Downeaster Rider Survey

Note: Respondents were asked to choose all that apply

Figure 44 Survey Question: One Way vs Return Trip

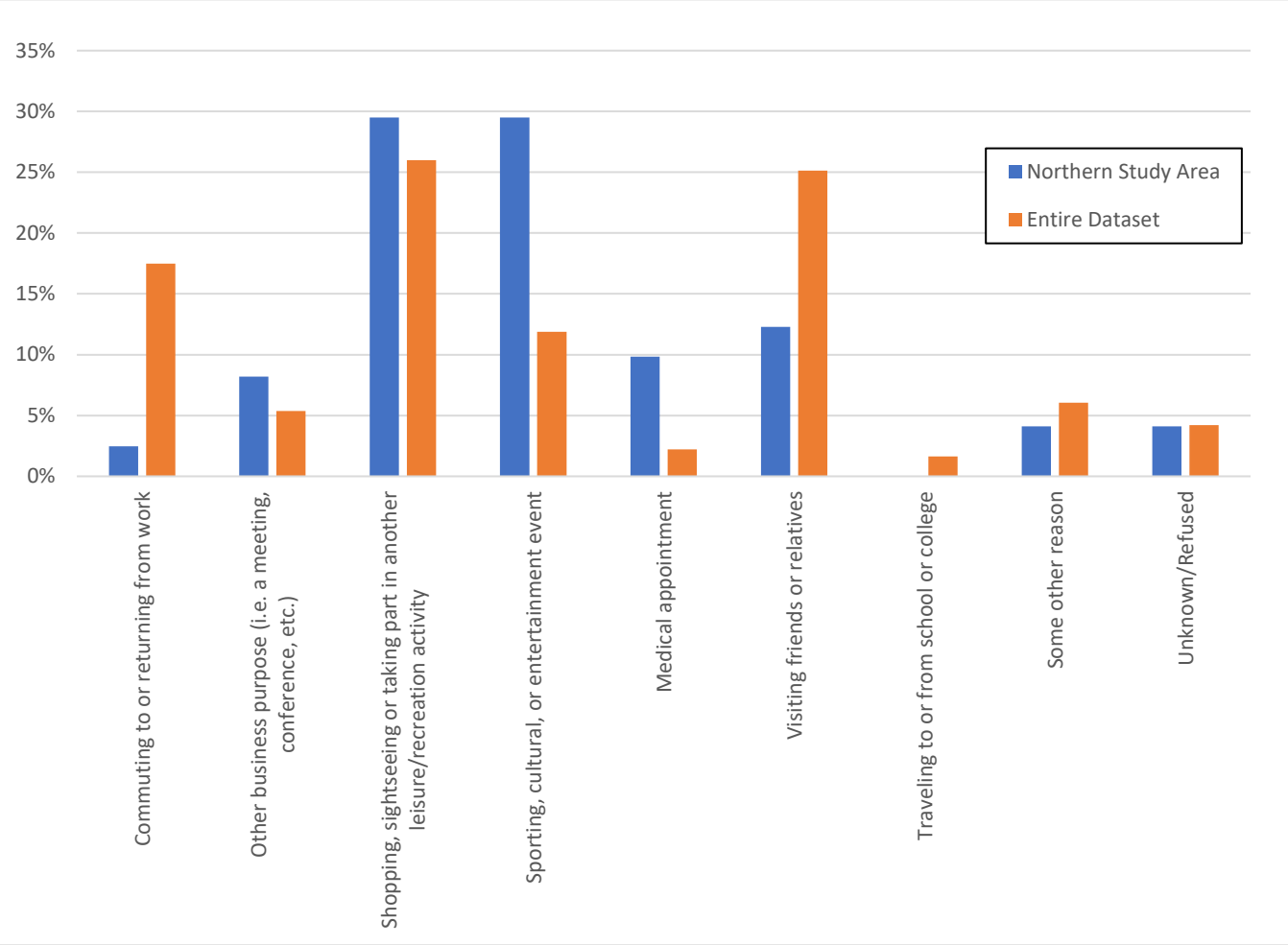


Source: 2016 Downeaster Rider Survey

Note: The question asked to survey respondents was: “Is the train trip you’re on right now…”

Figure 45 presents the respondent's trip purpose. The results show that Northern Study Area trips tend to be for leisure purposes, with the most frequent trip purposes being for "shopping, sightseeing or taking part in another leisure/recreation activity" and "sporting, cultural, or entertainment event".

Figure 45 Survey Question: Trip Purpose



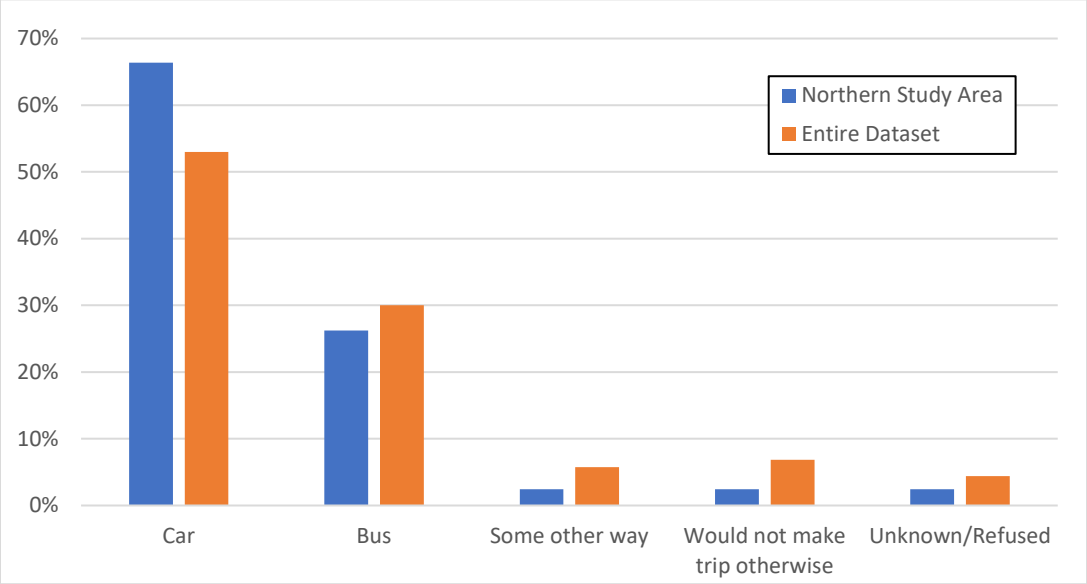
Source: 2016 Downeaster Rider Survey

Note: The question asked to survey respondents was: "Which one of the following best describes the overall purpose of your trip today on the Downeaster?"

Figure 46 shows how respondents would travel if the Downeaster were not available. As can be seen, riders from the Northern Study Area would be more likely to drive if no Downeaster service were available.

Figure 47 presents how frequently respondents make the trip that they're on, regardless of whether it is on the Downeaster. The results indicate that riders from the Northern Study Area are more likely to be occasional inter-city travelers, making the same trip fewer than nine times a year.

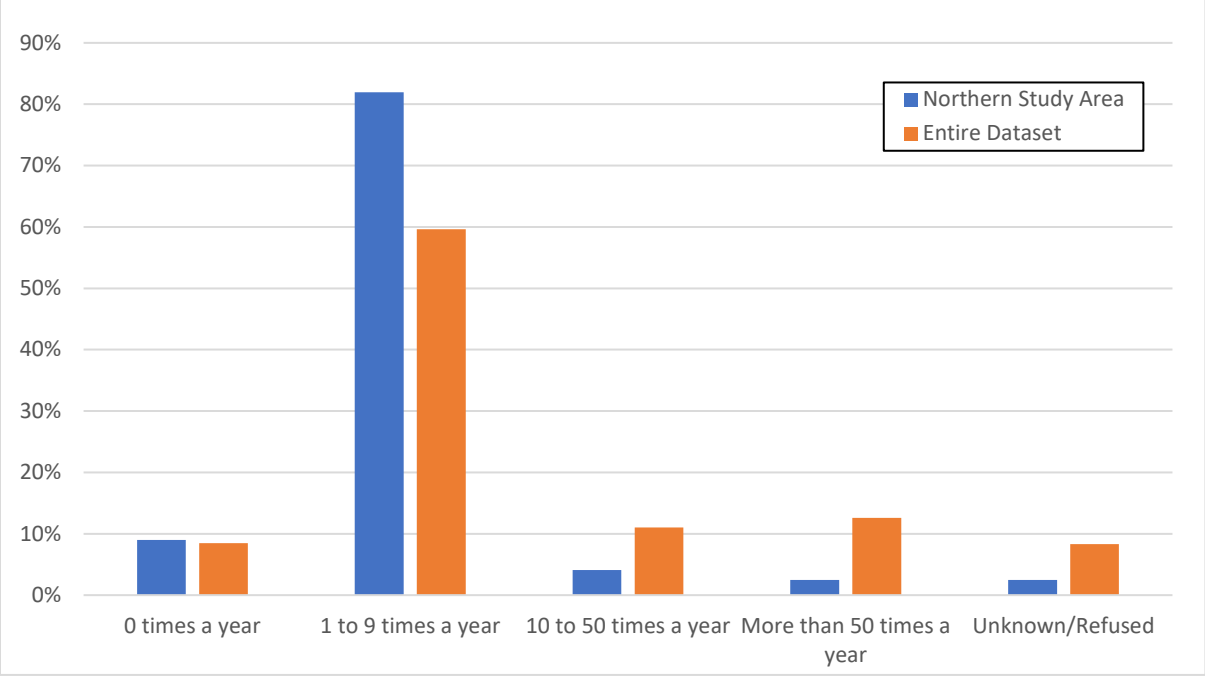
Figure 46 Survey Question: Alternative to Downeaster



Source: 2016 Downeaster Rider Survey

Note: The question asked to survey respondents was: "If the Amtrak Downeaster were not an available option, how would you most likely make this trip?"

Figure 47 Survey Question: Frequency of Travel (Regardless of Mode)



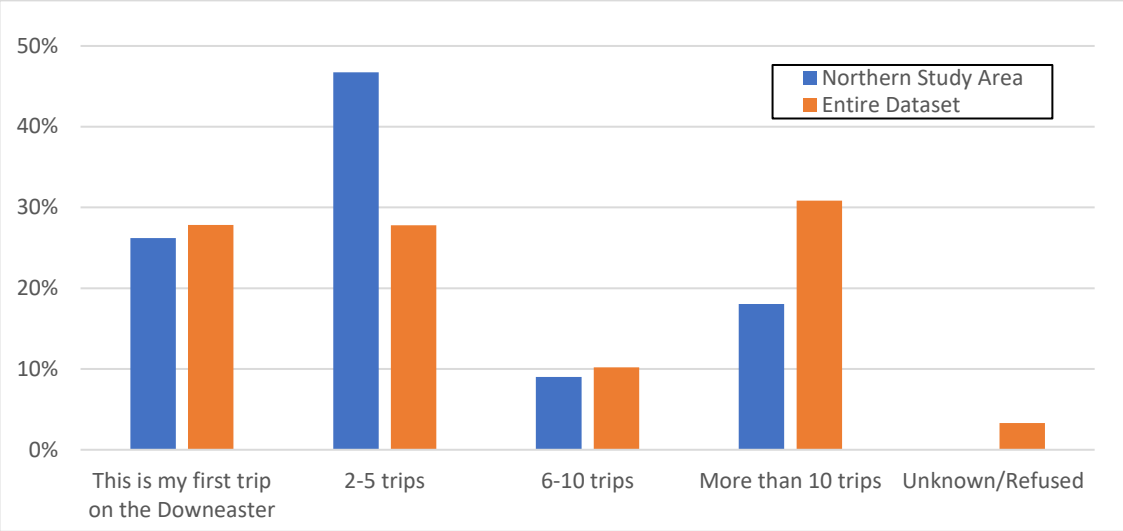
Source: 2016 Downeaster Rider Survey

Note: The survey question asked to survey respondents was: "In an average year, how often do you make the trip you're on today, whether it is by train or some other mode of transportation?"

Respondents were asked how many trips they have taken on the Downeaster. As can be seen in Figure 48, riders from the Northern Study Area have generally traveled less on the Downeaster than the rest of those surveyed.

Respondents to the survey were also asked how often they use the Downeaster for the type of trip that they were on. The results, shown in Figure 49, demonstrate that between the two groups, loyalty to the Downeaster is similar.

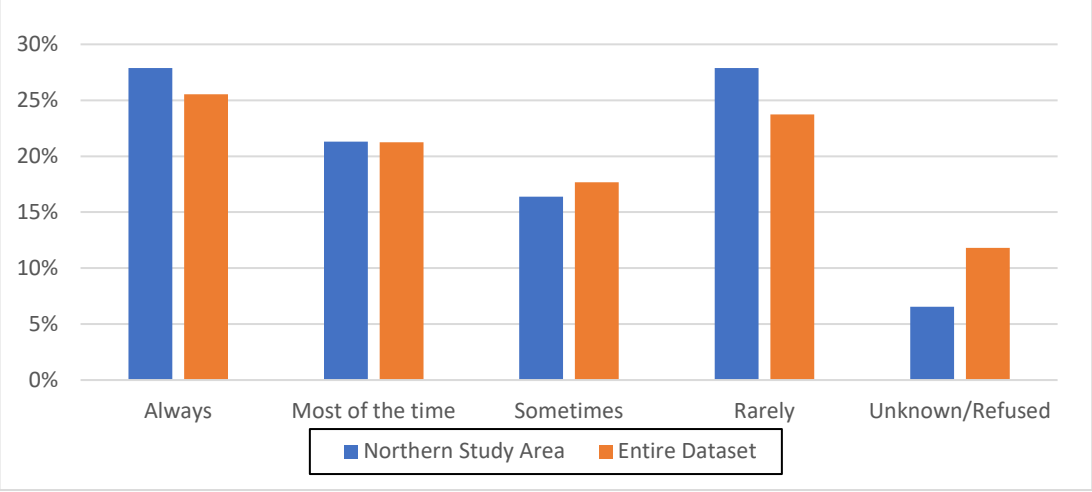
Figure 48 Survey Question: Number of Trips on Downeaster



Source: 2016 Downeaster Rider Survey

Note: The survey question asked to survey respondents was: "Including today's trip, how many total trips have you made on the Downeaster?"

Figure 49 Survey Question: How Often Downeaster Used

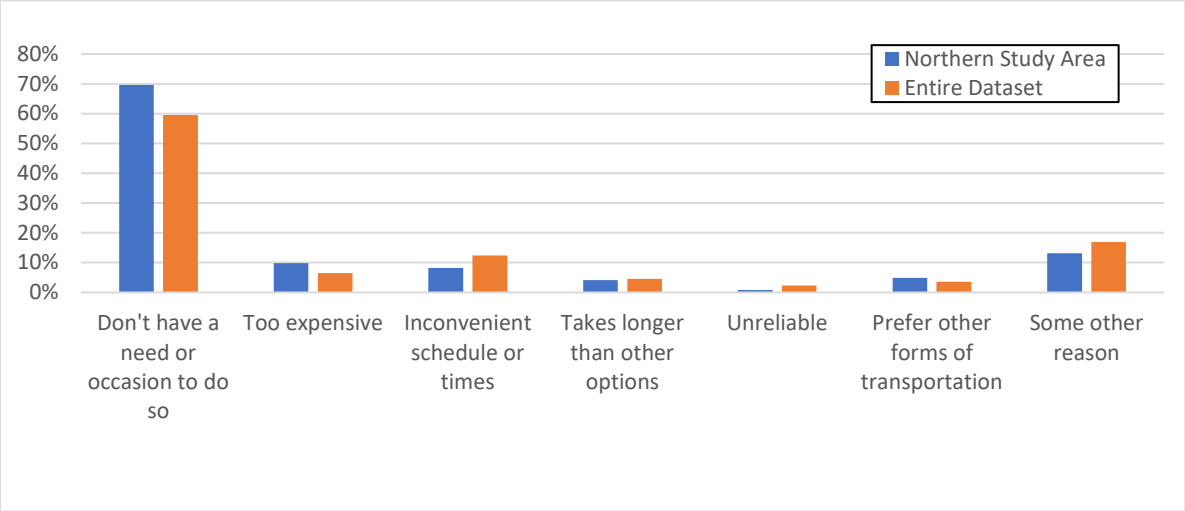


Source: 2016 Downeaster Rider Survey

Note: The survey question asked to survey respondents was: "How often do you use the Downeaster for these trips?"

The next question examined from the survey asked respondents why they do not ride the Downeaster more often (Figure 50). For both groups, the most common reason was that there was not a need or occasion to do so.

Figure 50 Reasons for not Riding Downeaster more Often

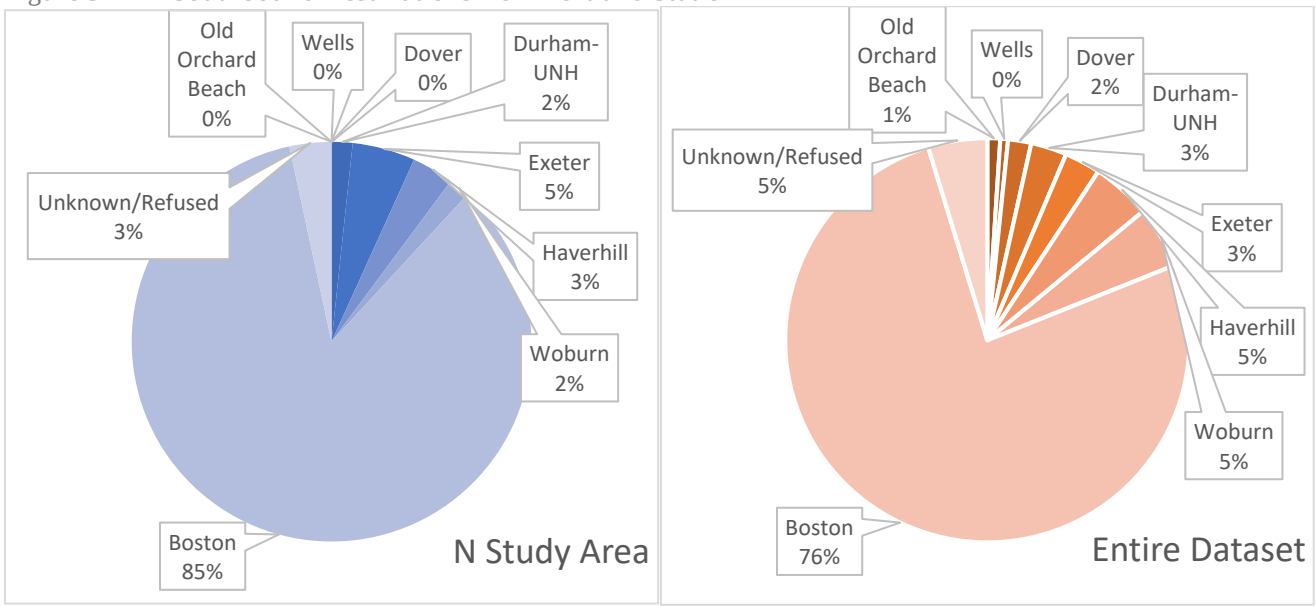


Source: 2016 Downeaster Rider Survey

Note: Respondents were asked to choose all that apply.

As part of this analysis, the destination of surveyed passengers was also examined in greater depth (Figure 51). This analysis, which focused specifically on Portland Station, found that the predominant destination in the southbound direction (for both groups) is Boston.

Figure 51 Southbound Destinations from Portland Station



Source: 2016 Downeaster Rider Survey

To better understand how similar the travel behavior is of those residing in the Northern Study Area compared to existing portions of the Downeaster, an additional analysis was conducted. This analysis examined trip purpose against where respondents got on and off the train (Table 21 and Table 22, respectively). As can be seen in the tables, the closer to Boston a station is, the more likely a respondent is to be taking the train for work purposes. Conversely, the further away from Boston a station is, the more likely a respondent is to be taking the train for leisure purposes. Using these results, one can conclude that respondents in the Northern Study Area seem to exhibit travel behavior that is consistent with travel observed in the northern portions of the Downeaster route.

Table 21 Trip Purpose by Where Respondents Got on the Train

		Trip Purpose							
		Commuting to or returning from work	Other business purpose (i.e. a meeting, conference, etc.)	Shopping, sightseeing or taking part in another leisure / recreation activity	Sporting, cultural, or entertainment event	Visiting friends or relatives	All other reasons	Unknown / Refused	Grand Total
Where did you get on the train?	Brunswick	10%	10%	26%	14%	27%	12%	0%	100%
	Freeport	12%	0%	59%	0%	24%	6%	0%	100%
	Portland	9%	6%	26%	27%	20%	10%	3%	100%
	Old Orchard Beach	13%	5%	44%	7%	18%	4%	9%	100%
	Saco	25%	2%	13%	23%	24%	6%	8%	100%
	Wells	25%	2%	22%	3%	32%	10%	7%	100%
	Dover	40%	3%	27%	13%	9%	8%	0%	100%
	Durham-UNH	46%	4%	10%	2%	15%	15%	8%	100%
	Exeter	58%	2%	14%	8%	8%	5%	8%	100%
	Haverhill	70%	0%	4%	13%	9%	4%	0%	100%
	Woburn	*Note: Woburn stop is only for drop-offs, not pick-ups going southbound							

Source: 2016 Downeaster Rider Survey

Table 22 Trip Purpose by Where Respondents Get Off the Train

		Trip Purpose							
		Commuting to or returning from work	Other business purpose (i.e. a meeting, conference, etc.)	Shopping, sightseeing or taking part in another leisure / recreation activity	Sporting, cultural, or entertainment event	Visiting friends or relatives	All other reasons	Unknown / Refused	Grand Total
Where will you get off the train?	Brunswick	4%	13%	17%	2%	51%	11%	2%	100%
	Freeport	0%	11%	28%	0%	56%	0%	6%	100%
	Portland	5%	7%	35%	8%	28%	13%	4%	100%
	Old Orchard Beach	4%	1%	49%	4%	22%	14%	5%	100%
	Saco	11%	13%	22%	5%	31%	15%	5%	100%
	Wells	12%	3%	27%	6%	40%	9%	4%	100%
	Dover	26%	3%	17%	10%	32%	5%	6%	100%
	Durham-UNH	32%	15%	9%	9%	15%	21%	0%	100%
	Exeter	43%	3%	15%	4%	22%	7%	6%	100%
	Haverhill	75%	0%	4%	0%	21%	0%	0%	100%
	Woburn	*Note: Woburn stop is only for pick-ups, not drop-offs going northbound							

Source: 2016 Downeaster Rider Survey

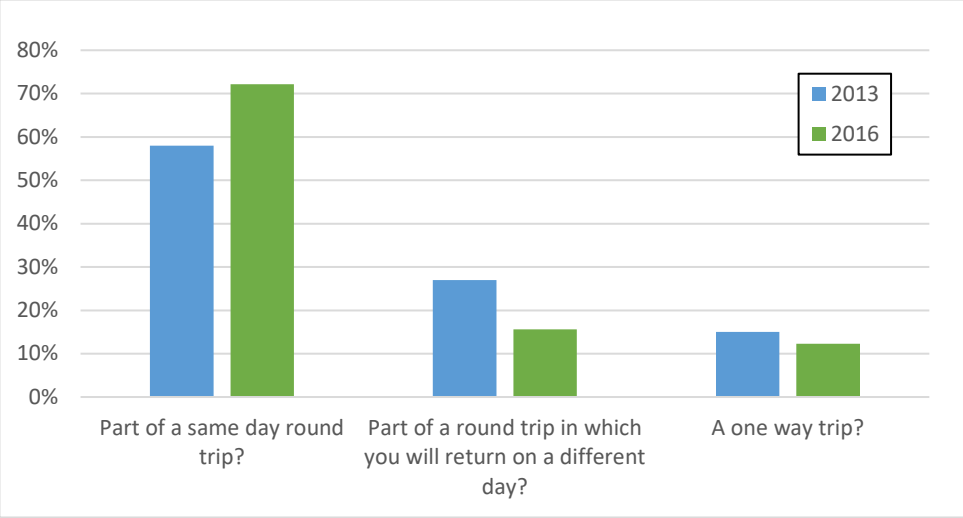
3.9.1.2 Historical Comparison of Northern Study Area

This subsection examines the data from historical Downeaster surveys, focusing specifically on riders from the Northern Study Area. As part of this analysis, the 2011, 2012, 2013, and 2016 surveys were examined.

One important thing to point out is that depending on the question, there may be data gaps, since questions were added or removed with each survey year.

The first question that was compared was whether trips from the Northern Study Area are being taken is part of a round trip or one-way trip. As shown in Figure 52, there has been a slight increase in the portion of trips being same day round trips between 2013 and 2016.

Figure 52 Survey Question: One Way vs Return Trip (Northern Study Area)

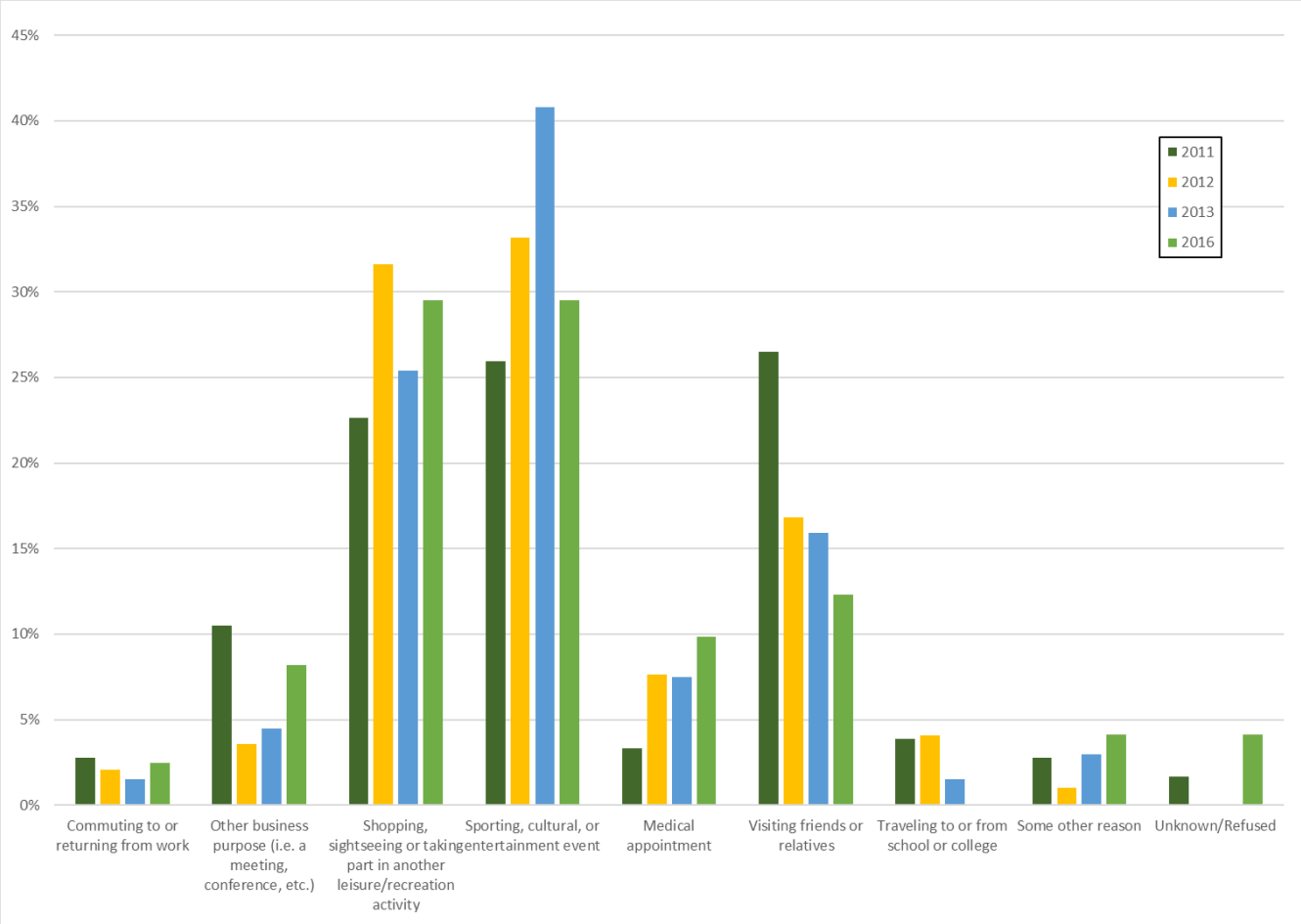


Source: 2013 and 2016 Downeaster Rider Surveys

Note: The question asked to survey respondents was: "Is the train trip you're on right now…"

The next question that was compared across the different surveys was trip purpose. As can be seen in Figure 53, there has been a general increasing trend for leisure travel among riders living in the Northern Study Area (as evidenced by the "shopping, sightseeing or taking part in another leisure/recreation activity" and "sporting, cultural, or entertainment event" categories).

Figure 53 Trip Purpose (Northern Study Area)



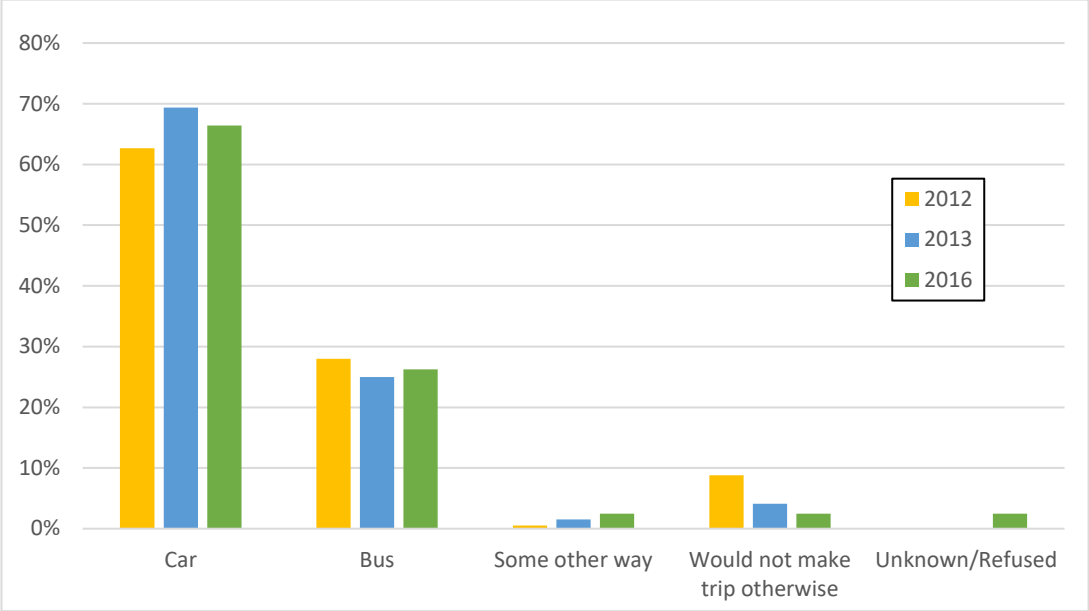
Source: 2011, 2012, 2013, and 2016 Downeaster Rider Surveys

Note: The question asked to survey respondents was: "Which one of the following best describes the overall purpose of your trip today on the Downeaster?"

When comparing the responses of how respondents would travel if the Downeaster were not available, it can be seen in Figure 54 that respondents in the Northern Study Area have consistently stated that the car would be their preferred alternative.

In terms of the frequency of making the same trip that they're on (Figure 55), respondents in the Northern Study Area have consistently responded that they are leisure travelers, making the same trip fewer than nine times per year.

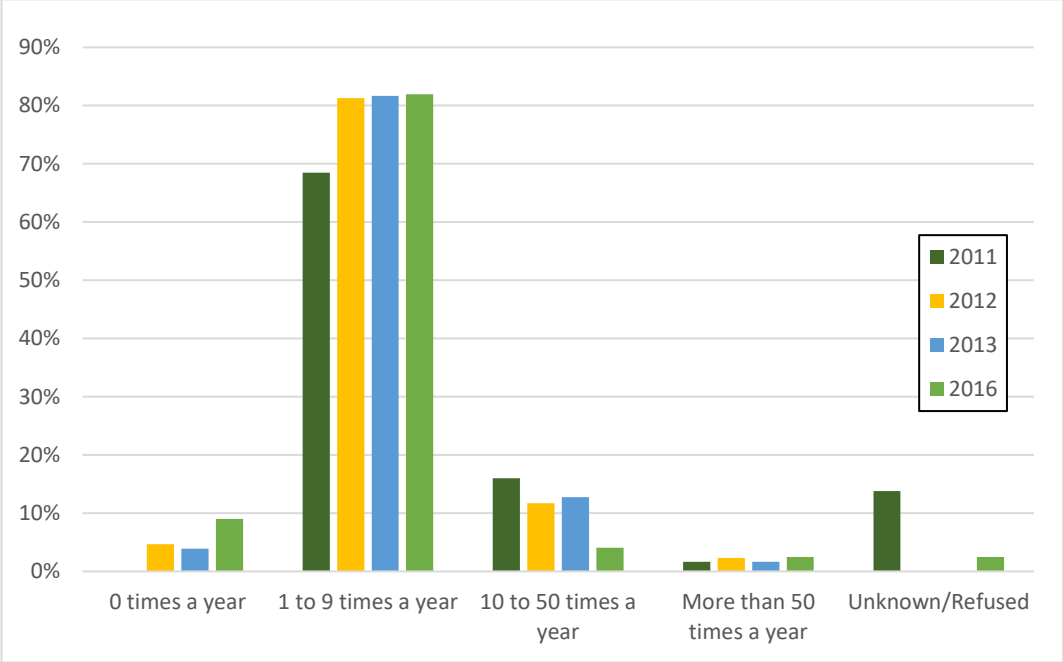
Figure 54 Alternative if Downeaster were not Available (Northern Study Area)



Source: 2012, 2013, and 2016 Downeaster Rider Surveys

Note: The question asked to survey respondents was: "If the Amtrak Downeaster were not an available option, how would you most likely make this trip?"

Figure 55 Frequency of Travel (Northern Study Area)

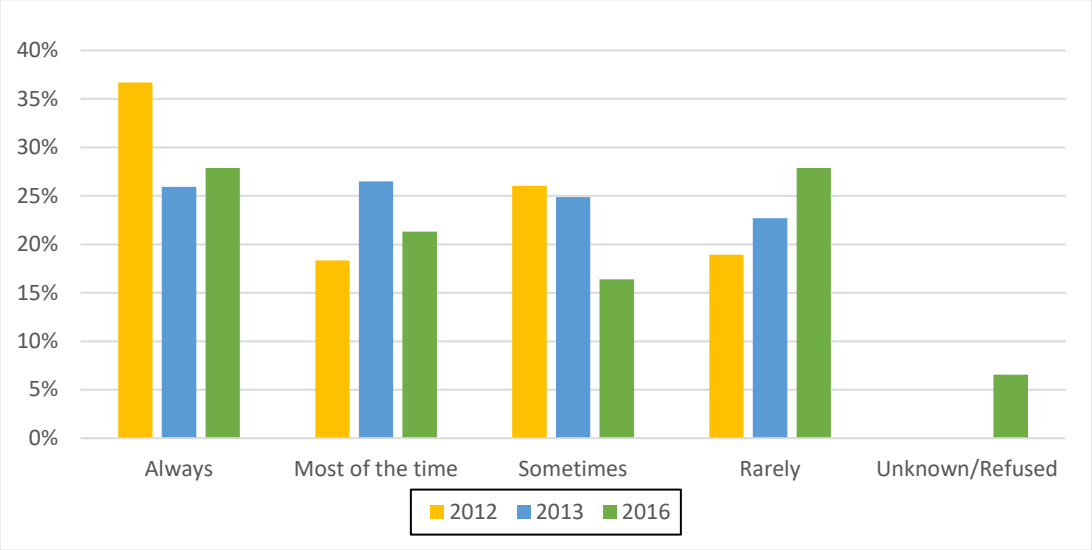


Source: 2011,2012, 2013, and 2016 Downeaster Rider Surveys

Note: The survey question asked to survey respondents was: "In an average year, how often do you make the trip you're on today, whether it is by train or some other mode of transportation?"

The next question examined how often riders from the Northern Study Area rode the Downeaster for the type of trip that they were on. Based on a comparison of historical datasets (see Figure 56), there is no clear trend on Downeaster loyalty/usage.

Figure 56 How Often Downeaster Used (Northern Study Area)

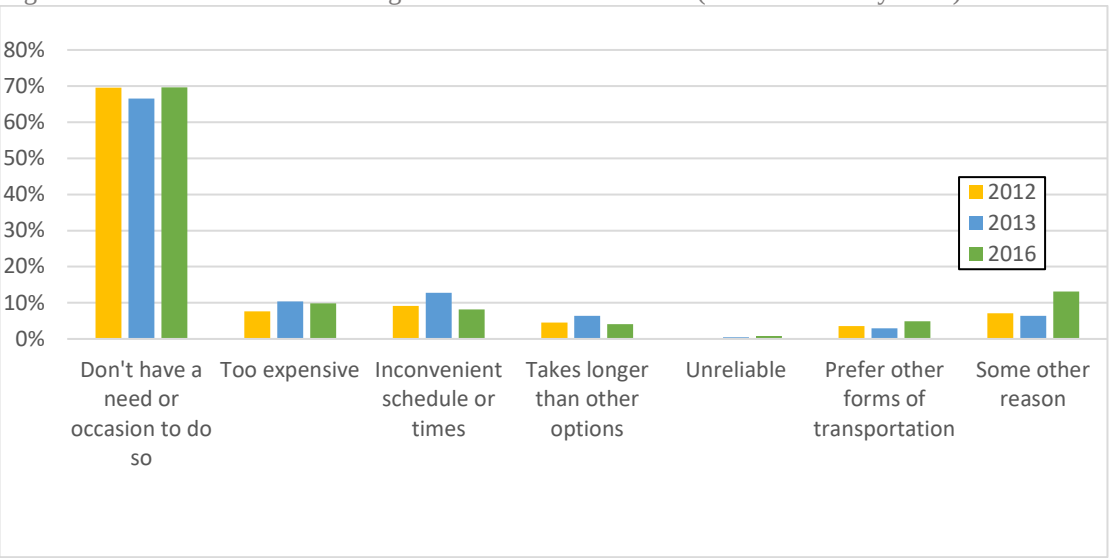


Source: 2012, 2013, and 2016 Downeaster Rider Surveys

Note: The survey question asked to survey respondents was: "How often do you use the Downeaster for these trips?"

In comparing why riders from the Northern Study Area do not ride the Downeaster more often, the predominant answer has been there is not a need or occasion to do so (Figure 57).

Figure 57 Reasons for not Riding Downeaster more Often (Northern Study Area)

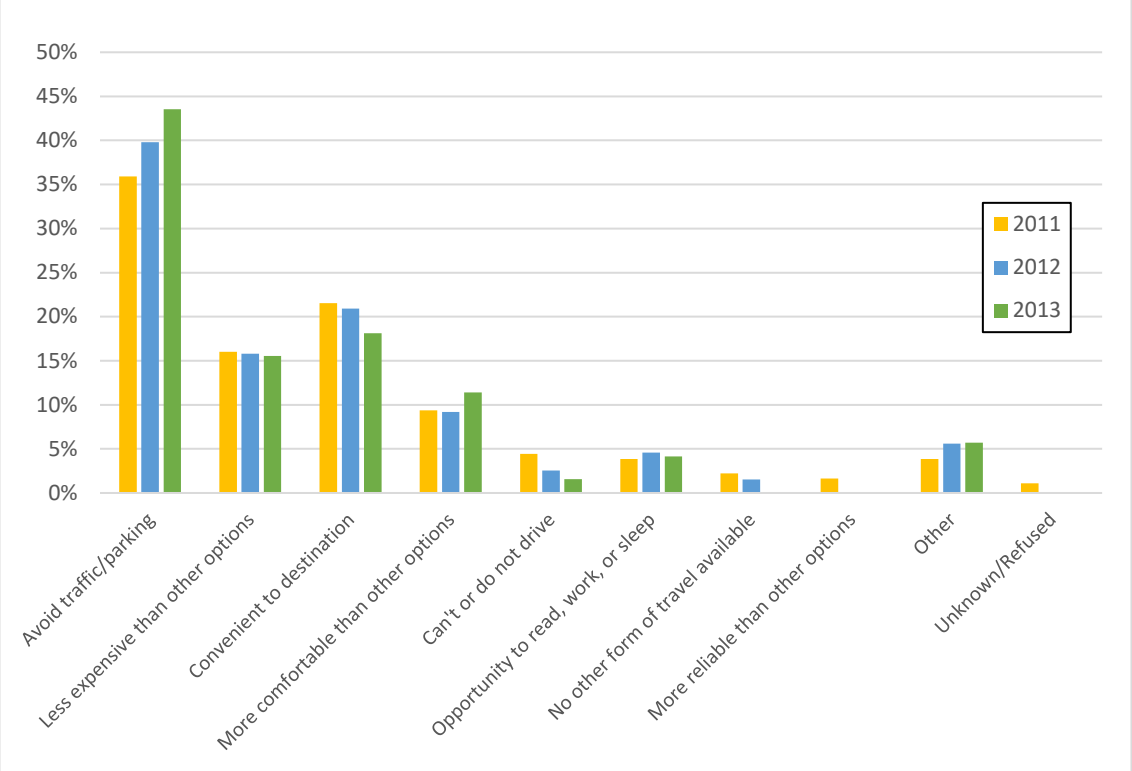


Source: 2012, 2013, and 2016 Downeaster Rider Surveys

Note: Respondents were asked to choose all that apply.

The last question that was examined was a question that was not asked in the 2016 survey, but was asked in the 2011, 2012, and 2013 surveys. This question asked why respondents chose to ride the Downeaster. As can be seen in Figure 58, the predominant reason for riding the Downeaster for respondents in the Northern Study Area was to avoid traffic and parking. It is also worth pointing out that this response had been trending upwards during the three years in which it was asked.

Figure 58 Reason for Riding the Downeaster (Northern Study Area)



Source: 2011, 2012, and 2013 Downeaster Rider Surveys

Note: The survey question asked to survey respondents was: "Which one of the following reasons best describes why you chose to ride the Amtrak Downeaster?"

3.9.2 Historical Ridership Data

This section offers a historical understanding of how the implementation of service improvements and additional stations have led to the robust ridership experienced along the Downeaster corridor today. Based on ridership and ticketing data provided by NNEPRA, average daily ridership for the service is presented in Table 23 and Figure 59.

Implementation of the Amtrak Downeaster service on December 15, 2001 resulted in the reinstatement of rail service along a corridor that had not seen a passenger train since 1965. Between opening day and August 2007, Amtrak offered four daily round trips between Portland, ME and Boston, MA. Strategic trackage improvements that were

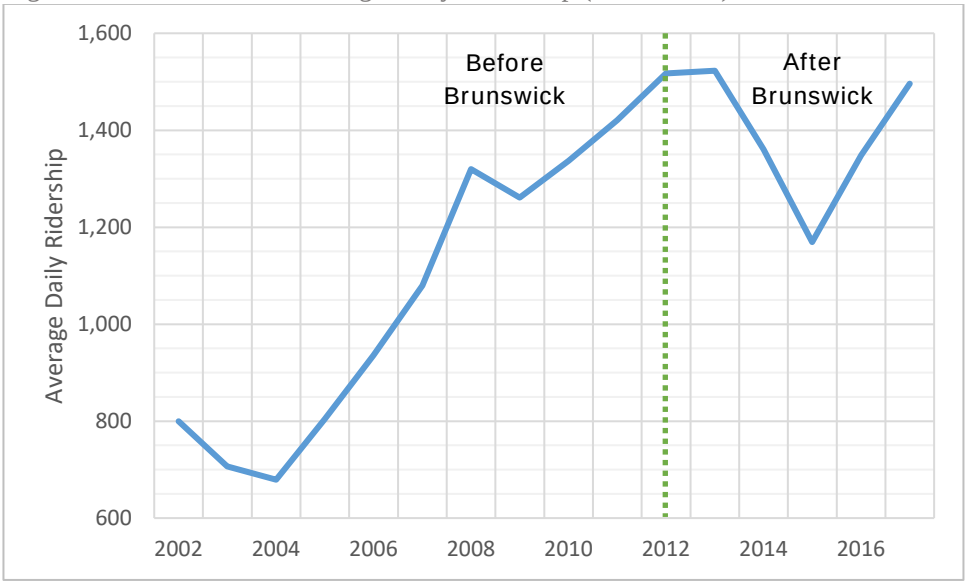
completed in August 2007 enabled faster speeds (change from 60 mph to 79 mph top speed reduced end-to-end travel time by 20 minutes) and the addition of one new round trip. This major change resulted in a 41 percent increase in average daily ridership between 2007 and 2012. Passenger rail service to new stations at Freeport and Brunswick was inaugurated on November 1, 2012 and ridership peaked in 2013 at 1,523 daily passengers. While ridership fell by 23 percent between 2012 and 2015, the service seems to have recovered, with 2017 average daily ridership levels comparable to the 2013 peak.

Table 23 Amtrak Downeaster Average Daily Ridership (2002, 2007, 2012, and 2017)

Year	Average Daily Ridership	Five Year Growth
2002	799	--
2007	1,079	35.0%
2012	1,517	40.5%
2017	1,496	-1.4%

Source: NNEPRA

Figure 59 Downeaster Average Daily Ridership (2002-2017)



Source: NNEPRA

3.9.3 Ridership Data by Train Number

To get a sense of the current service offerings and to understand which trains are most likely to conveniently serve the weekday commuter and weekend leisure traveler markets, the current weekday and weekend timetables for the Amtrak Downeaster are provided in Table 24 and Table 25, respectively.

Table 24 Amtrak Downeaster Weekday Service Schedule

Direction	Train Number	Route	Departure	Arrival
Inbound	680	Portland to Boston	5:20 AM	7:50 AM
	682	Brunswick to Boston	7:30 AM	10:50 AM
	684	Brunswick to Boston	11:05 AM	2:25 PM
	686	Portland to Boston	2:20 PM	4:50 PM
	688	Brunswick to Boston	5:25 PM	8:45 PM
Outbound	681	Boston to Portland	9:05 AM	11:35 AM
	683	Boston to Brunswick	1:05 PM	4:25 PM
	685	Boston to Brunswick	5:00 PM	8:15 PM
	687 (*)	Boston to Portland / Brunswick	6:15 PM	8:55 PM / 9:40 PM
	689 (*)	Boston to Portland / Brunswick	10:30 PM (**)	12:55 AM / 1:45 AM

Source: NNEPRA (May 1, 2018)

(*) Outbound service for these trains on Monday through Thursday terminates in Brunswick while Friday service ends in Portland.

(**) This train departs at 11:25 PM on evenings of Red Sox home games and concerts/events at TD Garden or Fenway Park.

Table 25 Amtrak Downeaster Weekend Service Schedule

Direction	Train Number	Route	Departure	Arrival
Inbound	690	Portland to Boston	6:20 AM	8:45 AM
	692	Brunswick to Boston	7:30 AM	10:50 AM
	694	Brunswick to Boston	11:20 PM	2:45 PM
	696	Portland to Boston	3:30 PM	6:00 PM
	698	Brunswick to Boston	6:05 PM	9:25 PM
Outbound	691	Boston to Brunswick	9:45 AM	1:05 PM
	693	Boston to Portland	12:10 PM	2:45 PM
	695	Boston to Brunswick	4:45 PM	8:05 PM
	697 (*)	Boston to Portland / Brunswick	7:35 PM	10:05 PM / 10:55 PM
	699 (*)	Boston to Portland / Brunswick	10:30 PM (**)	12:55 AM / 1:45 AM

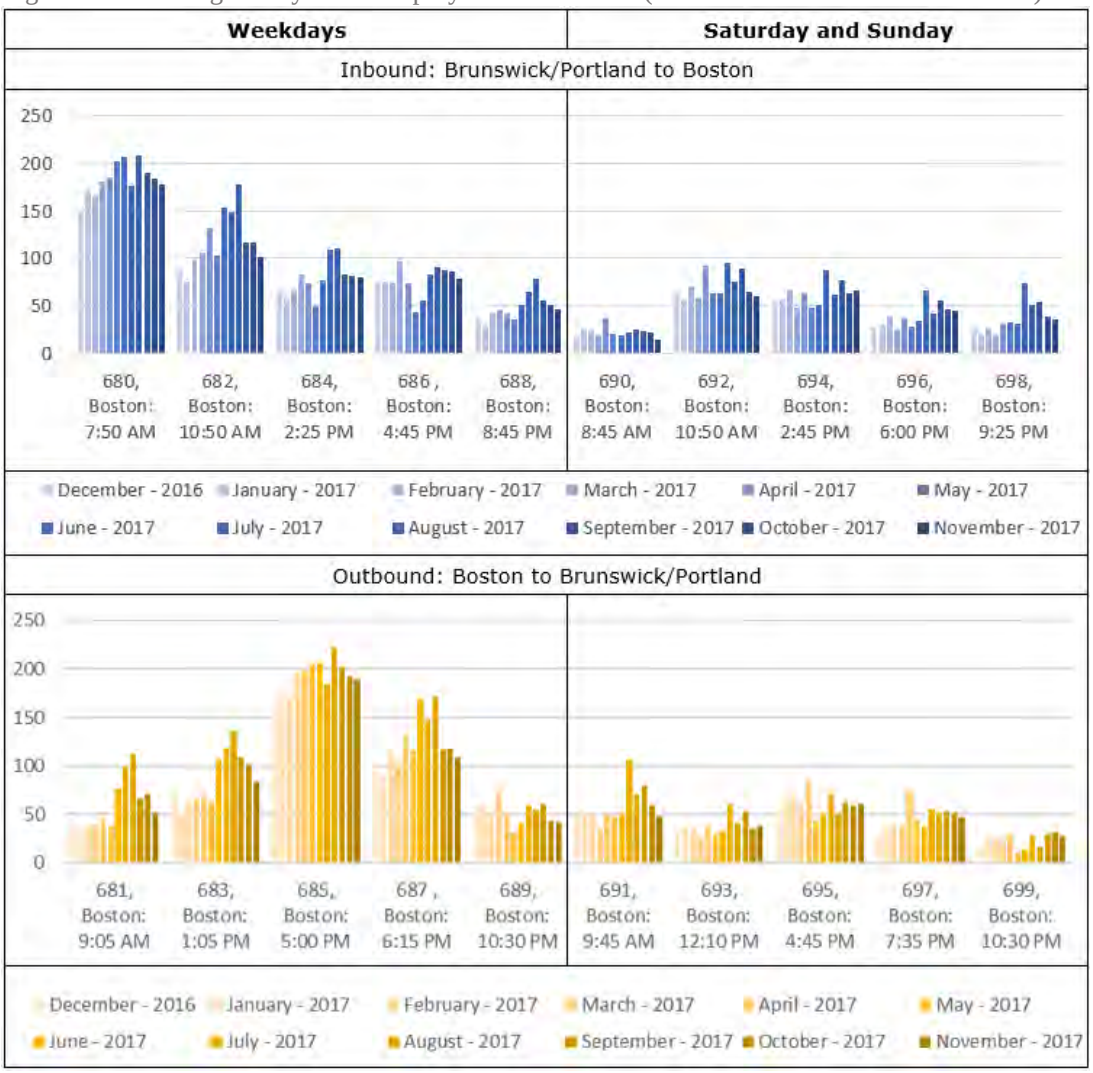
Source: NNEPRA (May 1, 2018)

(*) Outbound service for these trains terminates at Brunswick on Sunday and ends in Portland on Saturday.

(**) This train departs at 11:25 PM on evenings of Red Sox home games and concerts/events at TD Garden or Fenway Park.

Average daily ridership by train number by month for weekday and weekend service operated between December 2016 and November 2017 is provided in Figure 60. Maximum daily ridership of each train observation occurs within the center and gradually slopes downward to the left and right, indicating that the Downeaster experiences significant seasonal variation with ridership peaking during the summer months when tourists, in addition to regular commuters, make use of the service.

Figure 60 Average Daily Ridership by Train Number (December 2016-November 2017)



Source: NNEPRA

On weekdays, the inbound and outbound trains with the highest ridership correspond to Boston-based arrival and departure times that overlap with the standard commute schedule (i.e., the 680 inbound arriving to Boston at 7:50 AM and the return trip on the 685 outbound departing from Boston at 5:00 PM). Similarly, the second highest weekday ridership trains serve commutes that are shifted later in the day (i.e., the 682 inbound arriving to Boston at 10:50 AM and the 687 outbound departing from Boston at 6:15 PM). Aside from these two convenient train pairs, ridership on the other trains is significantly lower with limited evidence of reverse commuting. Thus, to realize a strong level of

weekday commuter-based ridership for a potential passenger rail service from Lewiston-Auburn, the service plan would need to provide inbound arrival and outbound departure times that closely align with traditional AM and PM peak commute times.

On weekends, the demand for rail service in both directions is evenly spread throughout the course of the day; however, the two trains with the highest ridership in both directions signal the presence of recreational/leisure day trips and overnight stays. In the inbound direction, the two trains with the highest ridership signal either the return of Massachusetts-based travelers from overnight stays in Portland or the arrival of Maine-based travelers to Boston for day trips (i.e., the 692 departing Brunswick at 7:30 AM and arriving to Boston at 10:50 AM and the 694 departing Brunswick at 11:20 AM and arriving to Boston at 2:45 PM). In the outbound direction, the two trains with the highest ridership correspond to the return of Maine-based travelers from Boston day trips (i.e., the 695 departing Boston at 4:45 and arriving to Brunswick at 8:05 PM) or the arrival of Massachusetts-based travelers returning from overnight stays in Maine (i.e., the 691 departing Brunswick at 9:45 AM and arriving to Boston at 1:05 PM). Thus, to capitalize on the strong existing weekend recreational/leisure-based markets between Maine and Massachusetts, the service plan for a potential passenger rail service should offer arrival and departure times that conveniently serve day trips and overnight stays.

3.9.4 Ridership Data by Station

Station-by-station average daily boardings (ons) and alightings (offs) for the period between December 2016 and November 2017 is presented in Table 26 and Figure 61, along with each station's share of total line ridership and the share of total non-Boston line ridership. Station-by-station counts of average daily ons and offs for each month during the period is provided in Figure 62.

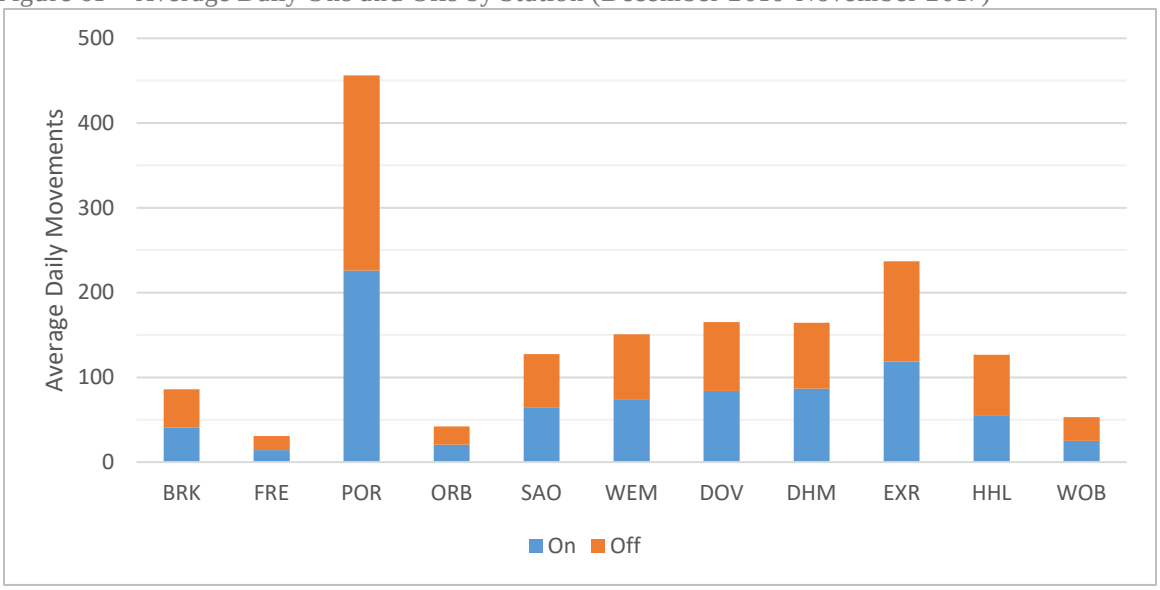
Activity along the Downeaster corridor is dominated by movements in and out of its major travel markets – Boston (43 percent) and Portland (16 percent). Aside from the two major markets, no single station accounts for more than eight percent of total ridership, with Brunswick and Freeport constituting a combined four percent of the line's ridership. Once movements at Boston's North Station are excluded from the analysis, Portland accounts for approximately 28 percent of non-Boston ridership and the three stations within New Hampshire each account for at least 10 percent.

Table 26 Average Daily Ons and Offs by Station (December 2016-November 2017)

Station	On	Off	Both	Share	Non-Boston Share
Brunswick, ME (BRK)	42	45	87	3.0%	5.3%
Freeport, ME (FRE)	15	17	32	1.1%	1.9%
Portland, ME (POR)	226	231	457	15.8%	27.7%
Old Orchard Beach, ME (ORB)	21	22	43	1.5%	2.6%
Saco, ME (SAO)	65	63	128	4.4%	7.8%
Wells, ME (WEM)	74	78	152	5.3%	9.2%
Dover, NH (DOV)	85	82	167	5.8%	10.1%
Durham, NH (DHM)	87	78	165	5.7%	10.0%
Exeter, NH (EXR)	119	119	238	8.3%	14.4%
Haverhill, MA (HHL)	55	73	128	4.4%	7.8%
Woburn, MA (WOB)	26	28	54	1.9%	3.3%
Boston, MA (BON)	627	606	1,233	42.8%	5.3%
ALL	1,442	1,442	2,884	100.0%	N/A

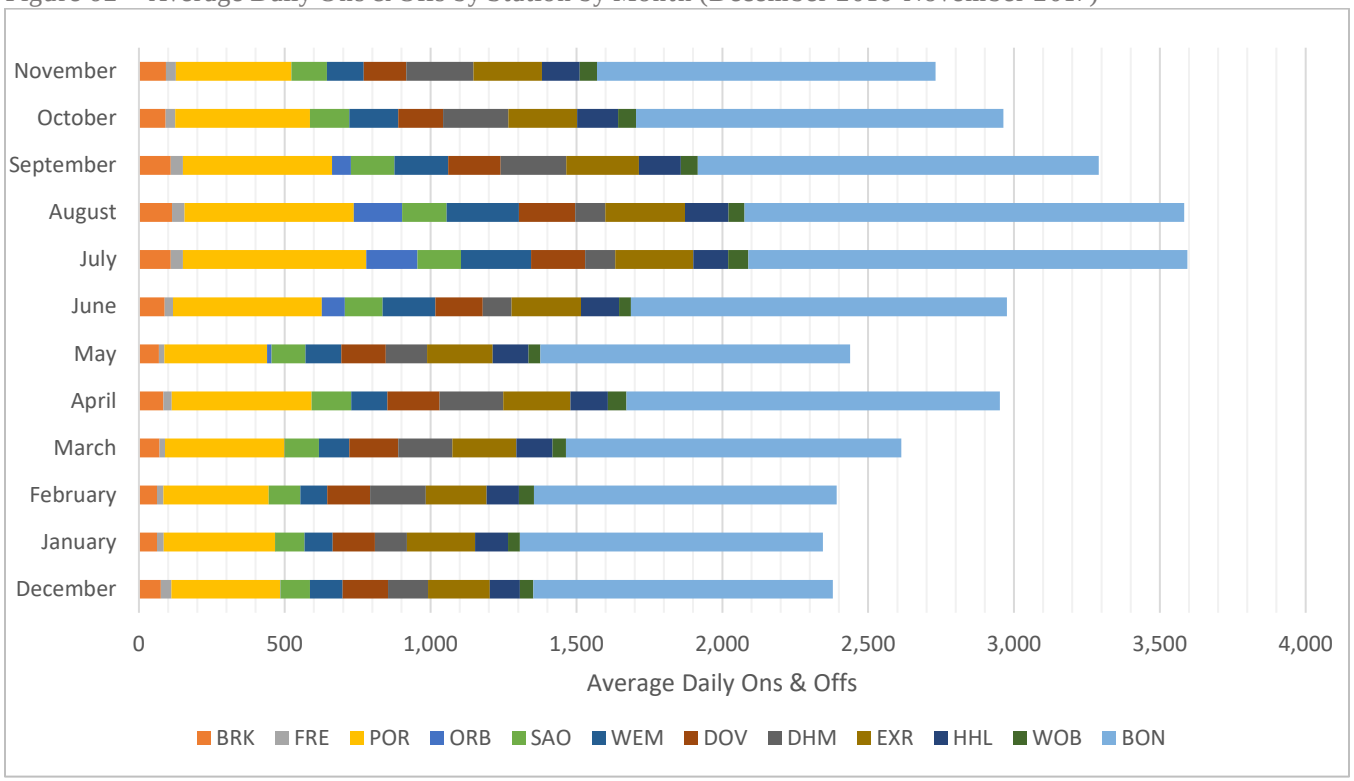
Source: NNEPRA

Figure 61 Average Daily Ons and Offs by Station (December 2016-November 2017)



Source: NNEPRA

Figure 62 Average Daily Ons & Offs by Station by Month (December 2016-November 2017)



Source: NNEPRA

3.9.5 Ridership Data between Station Pairs

Combined average daily boardings and alightings for Brunswick and Portland, as well as the distribution of activity between those stations and other Downeaster communities, is presented in Table 27 and Figure 63.

The majority of the Portland- and Brunswick-based activity (i.e., trips departing from or arriving to these stations) is focused on Boston. While non-Boston activity for Portland-based trips is distributed relatively evenly, non-Boston activity for Brunswick-based trips is heavily oriented towards Portland. Thus, the current Amtrak Downeaster service primarily provides utility for long-haul commute trips to Boston for Portland- or Brunswick-based travelers, but also proves useful for short-haul commute trips to Portland for Brunswick-based travelers.

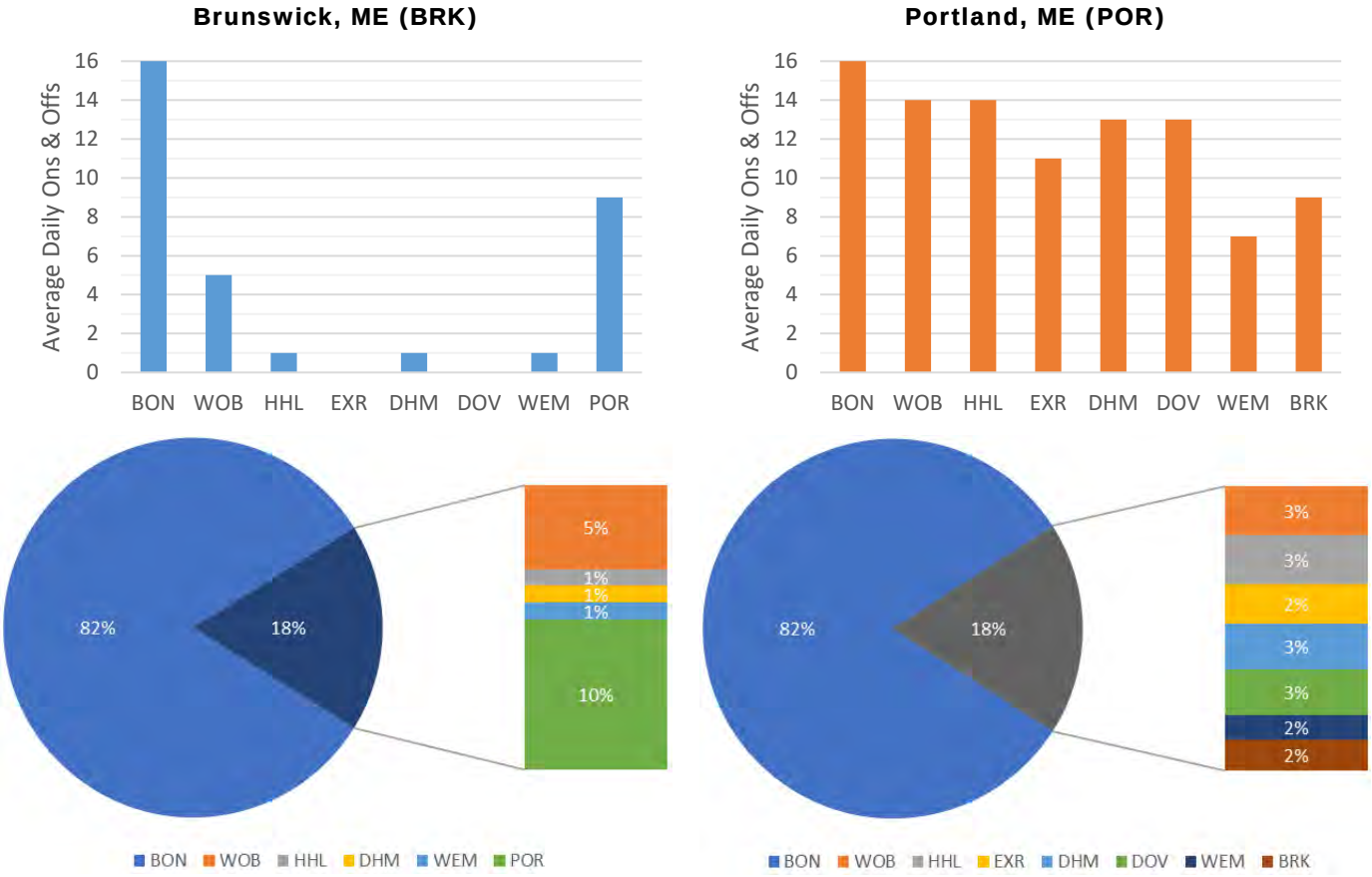
Table 27 Average Daily Ons & Offs by Station Pair (December 2016-November 2017)

	Portland, ME (POR)		Brunswick, ME (BRK)	
	Average Ons +Offs	Share	Average Ons + Offs	Share
Boston, MA (BON)	365	81.8%	79	82.3%
Woburn, MA (WOB)	14	3.1%	5	5.2%
Haverhill, MA (HHL)	14	3.1%	1	1.0%
Exeter, NH (EXR)	11	2.5%	0	0.0%
Durham, NH (DHM)	13	2.9%	1	1.0%
Dover, NH (DOV)	13	2.9%	0	0.0%
Wells, ME (WEM)	7	1.6%	1	1.0%
Portland, ME (POR)	N/A	N/A	9	9.4%
Brunswick, ME (BRK)	9	2.0%	N/A	N/A
ALL	446	100.0%	96	100.0%

Source: NNEPRA

Note: Ridership and ticketing data was not consistently available for Saco, ME (SAO), Old Orchard Beach, ME (ORB), and Freeport, ME (FRE) during this period and has been excluded.

Figure 63 Average Daily Ons & Offs by Station Pair (December 2016-November 2017)



Source: NNEPRA

Note: Ridership and ticketing data was not consistently available for Saco, ME (SAO), Old Orchard Beach, ME (ORB), and Freeport, ME (FRE) during this period and has been excluded.

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4

ECONOMIC DEVELOPMENT POTENTIAL

4.1 Introduction

To understand the potential for increased development within the Northern Study Area, as well as the Portland area, that would be generated as a result of a potential passenger rail service to Lewiston-Auburn, this chapter reviews population and employment growth trends before and after the 2012 extension of the Downeaster to Freeport and Brunswick, details development projects that have occurred adjacent to existing Downeaster stations over the past decade, and presents an alternative growth scenario that contemplates additional travel demand derived from stronger economic connections between the travel markets and new development adjacent to a potential passenger rail station in Lewiston-Auburn.

4.2 Population

To assess the change in population resulting from the 2012 Downeaster extension to Freeport and Brunswick in northeastern Cumberland County, average growth rates for the Southern Study Area, Cumberland County, and the State of Maine covering the periods from 2000 to 2009, 2009 to 2016, and 2000 to 2016 are provided in Table 28 and Figure 64.

The growth profile across the three time periods is quite similar for the Southern Study Area and the State of Maine, with a strong increase from 2000 to 2009 followed by moderate population growth between 2009 and 2016. Given that the trends for the Southern Study Area and the State of Maine city and statewide trends both reflect less

rapid growth from 2009 to 2016, one would expect a similar pattern to be reflected at the county level. However, the growth profile for Cumberland County shows a greater percentage increase in population from 2009 to 2016 relative to that recorded between 2000 and 2009.

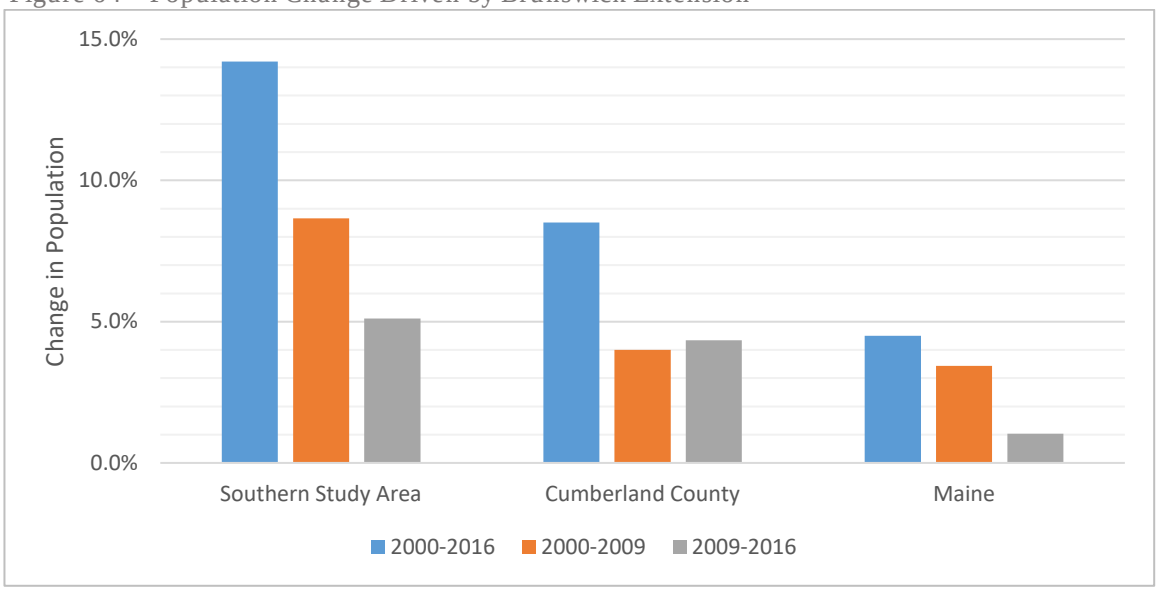
While correlation does not imply causation (i.e., other confounding variables may have been responsible for the county's higher growth rate from 2009 to 2016), the Cumberland County growth rate from 2009 to 2016 relative to that recorded between 2000 and 2009 suggests that the 2012 Downeaster extension to Freeport and Brunswick may have helped the portions of Cumberland County located outside of the Portland area grow at a relative rate that exceeded that of the city and state.

Table 28 Population Growth Before and After Brunswick Extension (2000-2016)

	2000-2009	2009-2016	2000-2016
Southern Study Area	8.7%	5.1%	14.2%
Cumberland County	4.0%	4.3%	8.5%
Maine	3.4%	1.0%	4.5%

Source: US Census Bureau – 2000 Decennial Census; 2005-2009 and 2012-2016 American Community Survey 5-Year Estimates

Figure 64 Population Change Driven by Brunswick Extension



Source: US Census Bureau – 2000 Decennial Census; 2005-2009 and 2012-2016 American Community Survey 5-Year Estimates

4.3 Employment

To understand the change in employment generated by the 2012 Downeaster extension to Freeport and Brunswick, annual unemployment rates for the Brunswick Micro, Portland-South Portland Metro, and the State of Maine from 2010 to 2017 are presented in Table 29 and Figure 65.

As indicated by the moving averages within Figure 65 (dotted lines), each of the geographies exhibits a similar downward logistic trend, reflecting moderate reductions in

the unemployment rate from 2010 to 2012, followed by a steep decrease between 2012 and 2015, and returning to a gradual decrease from 2015 to 2017. However, a comparison of the year over year change in the unemployment rate across the geographies reveals a different pattern. In 2011 and 2012, the year over year reduction in the unemployment rate was either -0.3 or -0.4 percent for both the Portland-South Portland Metro and the State of Maine while the Brunswick Micro experienced a smaller reduction of -0.1 percent each year. Although the magnitude of the unemployment rates differed, unemployed workers residing in the other two geographies were, nevertheless, securing new jobs at a relatively faster rate than those living in the Brunswick Micro during this two-year period.

In 2013, the unemployment rate for residents of the Brunswick Micro decreased by 1.0 percent compared to -0.6 and -0.9 percent reductions in the Portland-South Portland Metro and the State of Maine respectively. Despite trailing the Portland-South Portland Metro by 0.3 percentage points in 2012, the Brunswick Micro's significant reduction in 2013 was sufficient to bring its overall unemployment rate to 0.1 percent below that of the Portland-South Portland Metro. From 2014 to 2017, the Brunswick Micro continued to experience year over year reductions in the unemployment rate that were either identical to or within 0.2 percentage points of the changes recorded for the Portland-South Portland Metro and the State of Maine.

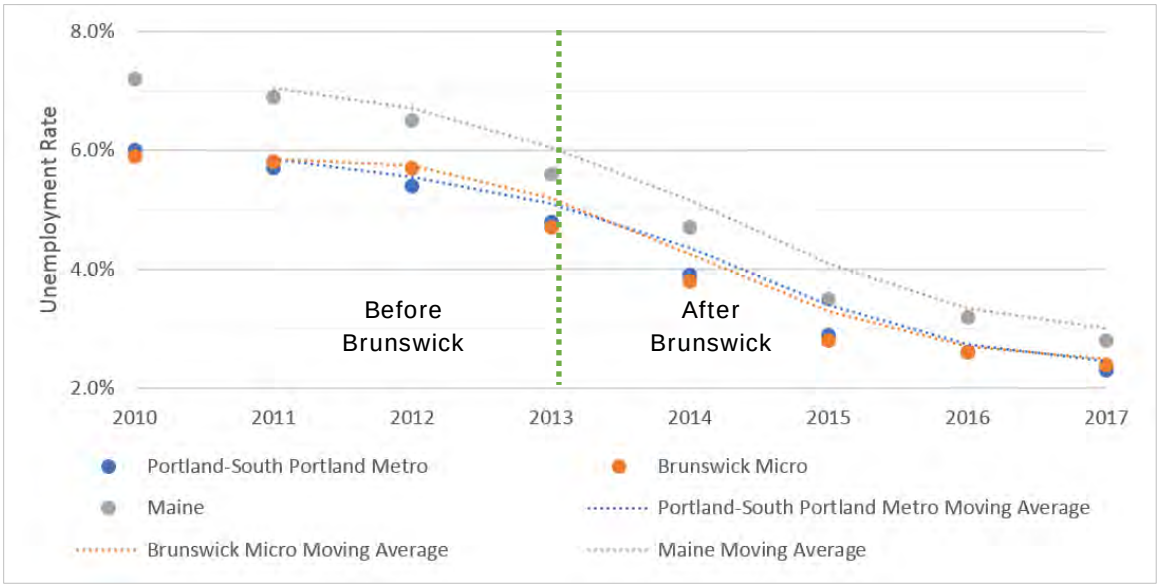
Although it is possible that the significant reduction in the 2013 unemployment rate for the Brunswick Micro relative to the other two geographies was due to other potential factors (e.g., major new employer or industry arriving to the area), the data suggests that the 2012 extension of Downeaster service to Brunswick may have assisted Brunswick-based workers in accessing additional employment opportunities further south.

Table 29 Comparison of Year over Year Change in Unemployment Rate Before and After Brunswick Extension (2010-2017)

	Unemployment Rate	**Year over Year Change in Unemployment Rate**		
Year	Brunswick Micro	Brunswick Micro	Portland- South Portland Metro	State of Maine
2010	5.9%	--	--	--
2011	5.8%	-0.1%	-0.3%	-0.3%
2012	5.7%	-0.1%	-0.3%	-0.4%
2013	4.7%	-1.0%	-0.6%	-0.9%
2014	3.8%	-0.9%	-0.9%	-0.9%
2015	2.8%	-1.0%	-1.0%	-1.2%
2016	2.6%	-0.2%	-0.3%	-0.3%
2017	2.4%	-0.2%	-0.3%	-0.4%

Source: Maine Department of Labor/Center for Workforce Research and Information

Figure 65 Comparison of Unemployment Rate Before and After Brunswick Extension (2010-2017)



Source: Maine Department of Labor/Center for Workforce Research and Information

4.4 New Development

To understand the extent to which a potential passenger rail service to Lewiston-Auburn could result in new real estate development adjacent to train stations, economic development reports commissioned by NNEPRA were consulted and a scan of recent Maine-based publications was conducted. This section presents a high-level summary of how the initial Downeaster service from Portland and the 2012 extension to Brunswick have spurred economic development in the surrounding areas.

4.4.1 New Development after Initial Service Introduced in 2001

The Center for Neighborhood Technology (CNT) published a report in 2008 that assessed the economic impacts of the Downeaster from 2005 to 2008[1]. The study indicated that between 2005 and 2008, proximity to existing or future Downeaster service was at least partially responsible for new economic development at Old Orchard Beach, Saco, Portland, and Brunswick.

At Old Orchard Beach, two hotels were constructed near the station during the three-year period as well as a $20 million residential and retail complex that was developed two blocks from the station in 2006. In Saco, the transformation of an old mill complex into a $110 million mixed-use complex called Island Point was attributed to the site's proximity to the train station. CNT went on to note that potential customers at the developer's focus groups "identified [proximity to the station] as a major attraction." Furthermore,

[1] Center for Neighborhood Technology. Amtrak *Downeaster Overview of Projected Economic Impacts*. 2008. Available at https://www.cnt.org/sites/default/files/publications/CNT_Downeaster-Projected-Benefits-FINAL-08.pdf

CNT mentioned that the developer's advertisements for Island Point "tout the station's proximity." The report also noted that a 30-acre site adjacent to the Portland Transportation Center (currently known as "Thompson's Point") was listed for the relatively high price of $12 million because of the development community's belief that it would serve as a prime site for a large mixed-use development. The study also noted that, at the time, developers in Brunswick were seeking approval from the Planning Board for a $30 million hotel, retail, office and residential complex that would leverage future proximity to the Downeaster and generate 200 jobs.

A 2005 study conducted by the Economic Development Research Group (EDRG) and KKO & Associates modeled the economic development benefits of the Downeaster in 2004[2]. EDRG quantified benefits from direct activities attributable to the Downeaster (increased visitor spending, additional economic development, and transportation cost savings) as well as spin-off activities that were indirectly generated by the rail service. The study estimated that, in 2004, the Downeaster was responsible for $15.122 million in business sales and the creation of 240 jobs in addition to the $1.284 million in business sales and 18 jobs that were attributed to Downeaster-related construction activities along the rail alignment and at station sites.

The 2005 EDRG report also quantified the amount of construction activity near existing stations in Old Orchard Beach and Saco that could be attributed to the Downeaster, which included the renovation of seven downtown establishments in Saco (valued at $1.3 million). Personal interviews revealed that approximately 38 percent ($468,000) of the construction activity was attributed to the owners' desires to enhance the properties given their lucrative proximity to the Saco station. Capital investments for a new downtown Chamber of Commerce building, which stands approximately 10 feet north of the edge of the platforms at Old Orchard Beach Station, totaled $640,000. Representatives from the chamber stated that the presence of the Downeaster and its potential to increase tourism to the area was partially responsible for their decision to construct a new building. Since roughly 25 percent of the decision to construct a new building could be attributed to the Downeaster, this 25 percent translated into approximately $160,000 in development spurred by the Downeaster. Thus, of the $1.94 million in construction activities near the stations in Saco and Old Orchard Beach in 2004, approximately one-third ($628,000) was attributable to the Downeaster.

4.4.2 New Development after Brunswick Extension in 2012

The 2008 CNT report also projected future economic benefits in 2030 that were expected to result from the Brunswick extension which was completed in 2012. Based on a $31.5 million investment to extend the Downeaster from Portland to Brunswick, thereby connecting the Downeaster with seasonal service along the Rockland Branch, CNT estimated the following economic development impacts in 2030:

- Cumulative construction investments of $7.2 billion;

[2] Economic Development Research Group and KKO & Associates. Economic Benefits of Amtrak Downeaster Service. 2005. Available at https://www.edrgroup.com/pdf/report-downeaster-final.pdf

- Construction/rehabilitation of over 42,000 housing units and 6.8 million square feet of commercial real estate;
- Creation of 17,800 jobs;
- $244 million in annual transportation cost savings for residents;
- $2.4 billion annual increase in resident and visitor purchasing power; and
- $75 million annual increase in state and local tax revenues.

The 2005 EDRG study also estimated the 2015 economic development impacts that would likely occur as a result of current or planned development proximate to the four existing stations (Saco, Old Orchard Beach, Wells, and Dover) as well as the two stations that are now served via the Brunswick extension (Freeport and Brunswick). While the anticipated economic development impacts near the four existing stations was expected to be substantial ($17.552 million in total business sales and 343 new jobs), the economic development impacts from activities near the then-planned stations at Freeport (100-key hotel and conference center located within the train station complex) and Brunswick (160,000 square foot retail and office complex) were significantly greater, with an expected $95.642 million in total business sales and 1,002 new jobs.

In addition to these modeling-based studies, there are numerous less rigorous, anecdotal reports within Maine-based publications that demonstrate positive attitudes among residents and the development community regarding rail transit's ability to generate positive economic impacts in the communities served.

The upcoming $105 million sports and entertainment complex at Thompson's Point, which is located between the Portland Transportation Center and Fore River, offers the strongest example of the positive influence that proximity to rail transit can have on adjacent parcels. Chris Thompson, owner of the development company undertaking the effort, commented that "the proximity to the transportation center was a huge factor for us in our initial decision to develop here." [3] After attending the December 2016 groundbreaking for the development, Portland Mayor Ethan Strimling offered the following positive endorsement of passenger rail's potential to catalyze development adjacent to stations:

> "We're starting to see a revitalization here and it's very exciting. We already have a number of small businesses, an ice skating rink and a concert venue on the water. All of this borders on the transportation hub,

[3] Amtrak – The Great American Stations. "Examining the Economic Impact of the Downeaster." 2017. Available at: http://www.greatamericanstations.com/examining-the-economic-impact-of-the-downeaster/

> which is vital to communities and especially important to Portland. What we have seen over time is the economic development that occurs around these hubs as commuters come into town or people learn about our city and start to see how unique it is." [3]

Similar sentiments have been voiced by developers and municipal staff located outside of bustling, urbanized Portland who have seen firsthand how proximity to rail transit has affected positive change in their communities. For example, the transformation of a contaminated brownfield in Brunswick into an economically vibrant area that is anchored by a rail station increased the value of the station site tenfold between 2008 and 2011 according to town property assessors, while also garnering 97 new full-time positions. In fact, the owner of a restaurant and a representative from JHR Development both noted that "our restaurants would cite the rail service as one of the primary reasons for locating at Brunswick Station." [4]

In Saco, where Chinburg Properties is developing a mixed-use complex featuring 150 apartments in an old tannery mill across the street from the station (Saco Mill No. 4), the developer similarly noted "… the fact that it's so close to an Amtrak station is a huge plus because we believe that many of our tenants will utilize the services of the train. When we advertise our new property, we talk about the convenience of living so close and being able to drive less." [3] According to the Saco City Administrator, Kevin Sutherland, over $900 million in economic development activity is underway in Saco and Biddeford, some of which is undoubtedly attributable to the Downeaster. The city administrator went on to say that "having the Amtrak station here in our region is a great way for our residents to commute to Portland and Boston for work. You are finding more and more that people have less of a desire to drive to work or to events." [3]

4.5 Analysis of Economic Development Potential

A comparison of the population and employment change for the Brunswick area, Portland area, and the State of Maine before and after the 2012 Downeaster extension to Freeport and Brunswick suggests that at least some of the recent growth experienced northeast of Portland can be attributed to the introduction of new passenger rail service to the area.

A review of new station-area development that took place after the Downeaster was launched in 2001, as well as after the service was extended to Freeport and Brunswick in 2012, demonstrates that private developers view the provision of passenger rail service as a premium amenity and market it as such. For parcels that are proximate to Downeaster stations, private developers appear to be more than willing to take significant financial risks to implement new residential, retail, commercial, and mixed-use complexes. Based on statements from elected officials and municipal staff, these station-area developments tend to act as catalysts for revitalizing the surrounding areas by transforming industrial sites into new housing units, job opportunities, and tax revenues.

[4] Amtrak – Great American Stations. "Economic Development: Brunswick, ME." 2018. Available at: http://www.greatamericanstations.com/why-invest/case-studies/economic-development-brunswick-me/

Thus, it is likely that the operation of the rail service will strengthen the existing social and economic connections shared by the Northern and Southern Study Areas and lead to population and employment growth that is greater than what is currently anticipated within the Maine STDM ("General New Development"). Moreover, the evidence presented above suggests that the introduction of a potential passenger rail service at a new station in Lewiston-Auburn will likely lead private developers to construct new housing units, as well as retail and commercial office space, proximate to the station, thereby generating additional new residential and employment opportunities ("Station-Area TOD").

Therefore, in addition to developing baseline ridership projections driven by the 2040 population end employment forecasts derived from the Maine STDM, this study will also generate ridership projections for a "Growth Scenario" that accounts for the population and employment increases expected to occur as a result of General New Development and Station-Area TOD.

4.6 Estimated Growth

For the Growth Scenario, the number of new residents and employment opportunities within the Northern Study Area and the Southern Study Area that are assumed to be generated by a potential passenger rail service to Lewiston-Auburn is presented in Table 30.

Table 30 Assumed 2040 Population and Employment Increase for Growth Scenario

	2040 New Residents			**2040 New Employment**		
	General New Development	Station-Area TOD	Total	General New Development	Station-Area TOD	Total
Northern Study Area	2,400	500	2,900	1,500	300	1,800
Lewiston-Auburn	*2,000*	*500*	*2,500*	*1,100*	*300*	*1,400*
Remaining Northern Study Area	*400*	--	*400*	*400*	--	*400*
Southern Study Area	2,800	500	3,300	3,500	300	3,800
Total	5,200	1,000	6,200	5,000	600	5,600

As the Growth Scenario contemplates the addition of 5,200 and 1,000 new residents due to General New Development and Station-Area TOD, respectively, it assumes there will be more people living proximate to the station than in the Base Scenario. Similarly, given that the Growth Scenario includes 5,000 and 600 new jobs as a result of General New Development and Station-Area TOD, respectively, it assumes there will be more people reporting to work sites that are proximate to the station than in the Base Scenario.

In addition to the operating characteristics of a potential passenger rail service (e.g., frequency, speed, etc.), both the magnitude and proximity of residents and jobs to the service function as fundamental inputs into projecting future passenger rail trips. Thus, as the Growth Scenario assumes 6,200 and 5,600 new residents and jobs, respectively, beyond the Base Scenario, it is anticipated that projected ridership for the Growth Scenario will be greater (i.e., more rail trips will occur) than the Base Scenario.

4.6.1 Comparison of Population Growth

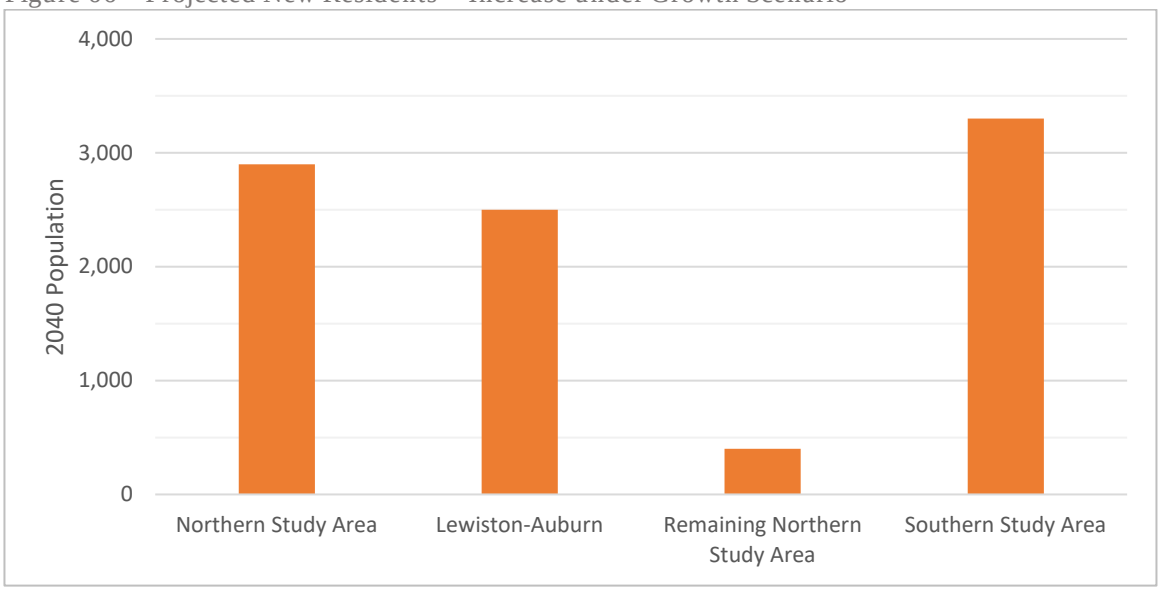
Projections of new residents within the Northern Study Area and the Southern Study Area under the Growth Scenario are provided in Table 31 and Figure 66.

Relative to the 2040 population forecast provided by the Maine STDM, the Growth Scenario anticipates 6,200 additional new residents, reflecting a two percent increase for a total of 468,986 residents within the Northern Study Area and the Southern Study Area. Within the Growth Scenario, stronger connections between the two travel markets (General New Development) are anticipated to generate 5,200 additional residents (84 percent of growth) while new housing units adjacent to the station (Station-Area TOD) are expected to attract 1,000 additional residents (16 percent). New TOD within the station-area is expected to result in 500 additional residents within the Northern Study Area and another 500 within the Southern Study Area beyond the 2,400 and 2,800 new residents, respectively, anticipated to come as a result of General New Development. The population increase from General New Development and Station-Area TOD is anticipated to result in a one and two percent increase in population within the Northern Study Area and the Southern Study Area, respectively.

Table 31 Projected New Residents – Base Scenario vs. Growth Scenario

	New Residents from Growth Scenario			**2040 Updated Population**	
	General New Development	Station-Area TOD	Total Increase	Value	Percentage Increase
Northern Study Area	2,400	500	2,900	299,166	1.0%
Lewiston-Auburn	*2,000*	*500*	*2,500*	*62,770*	*4.1%*
Remaining Northern Study Area	*400*	-	*400*	*236,396*	*0.2%*
Southern Study Area	2,800	500	3,300	169,820	2.0%
Total	5,200	1,000	6,200	468,986	2.3%

Figure 66 Projected New Residents – Increase under Growth Scenario



4.6.2 Comparison of Employment Growth

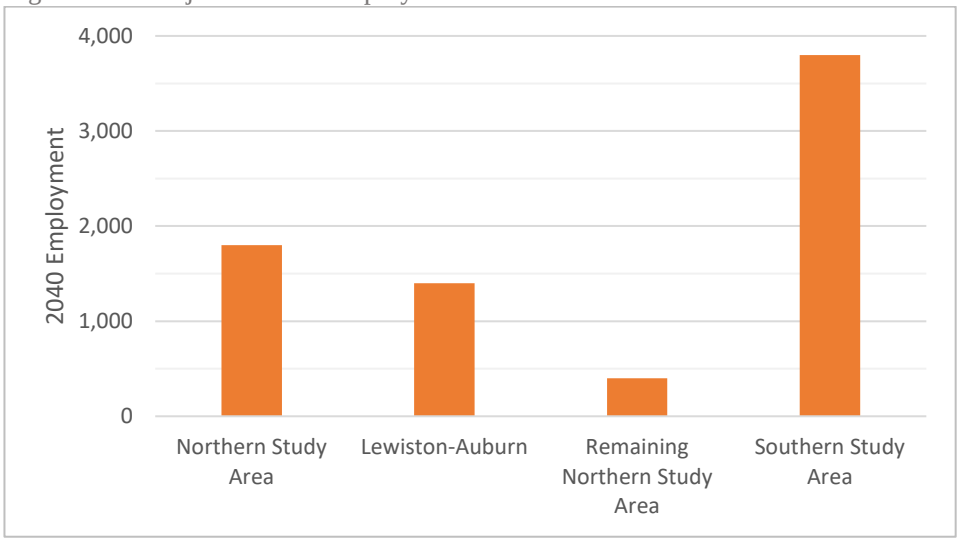
Projections of new employment opportunities within the Northern Study Area and the Southern Study Area under the Growth Scenario are provided in Table 32 and Figure 67.

Relative to the 2040 employment forecast provided by the Maine STDM, the Growth Scenario anticipates 5,600 additional new residents, reflecting a two percent increase for a total of 272,972 jobs within the Northern Study Area and the Southern Study Area. Within the Growth Scenario, stronger connections between the two travel markets (General New Development) are anticipated to generate 5,000 additional jobs (89 percent of growth) while new retail and office sites adjacent to the station (Station-Area TOD) are expected to attract 600 additional jobs (11 percent). New TOD within the station-area is expected to result in 300 additional jobs within the Northern Study Area and another 300 within the Southern Study Area beyond the 1,500 and 3,500 new jobs, respectively, that are anticipated to come as a result of General New Development. The employment increase from General New Development and Station-Area TOD is expected to result in a one and three percent increase in employment opportunities within the Northern Study Area and the Southern Study Area, respectively.

Table 32 Projected New Employment – Base Scenario vs. Growth Scenario

	New Employment from Growth Scenario			**2040 Updated Employment**	
	General New Development	Station-Area TOD	Total Increase	Value	Percentage Increase
Northern Study Area	1,500	300	1,800	133,195	1.4%
Lewiston-Auburn	*1,100*	*300*	*1,400*	*44,674*	*3.2%*
Remaining Northern Study Area	*400*	-	*400*	*88,521*	*0.5%*
Southern Study Area	3,500	300	3,800	139,777	2.8%
Total	5,000	600	5,600	272,972	2.1%

Figure 67 Projected New Employment – Increase under Growth Scenario



5

PUBLIC OUTREACH

5.1 Introduction

While data can be collected to understand how people travel today and potentially would use a passenger rail service to Lewiston-Auburn, there is also a human element to travel that must be considered. To better understand and account for this, public outreach was an integral part of this study.

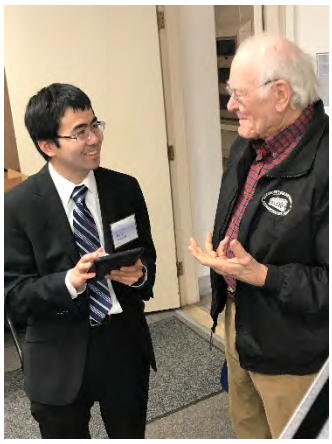
To connect with the people living and working in the Study Area, two open houses (one in Portland and one in Lewiston) were organized. Each open house was structured to provide the public with information on the project and to solicit input from the public on their travel patterns/preferences.

For those that were unable to attend one of the open houses, a project website (http://www.nnepra.com/projects/lewistonauburn-passenger-rail-service-plan) was developed, which also included an online survey to solicit input.

The data obtained from these two open houses and the online survey are discussed in greater detail in subsequent sections.

5.2 Portland Open House

The Portland Open House was held on Tuesday, March 27, 2018 from 4:30 PM to 6:30 PM at Portland City Hall, Room 24 (389 Congress Street, Portland, ME 04101).



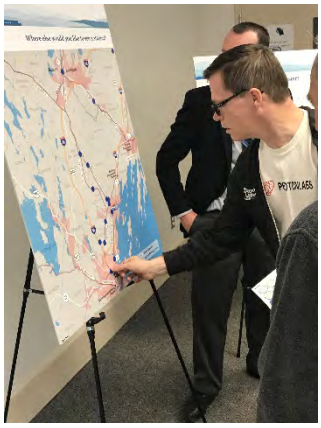
This open house was used to provide the public with information on the Lewiston-Auburn Passenger Rail Project and to solicit input from the public on their travel patterns/preferences via dot voting on boards and a tablet survey. Specifically, there were eight stations where attendees were asked the following questions (a detailed summary of attendee responses is included in the "Data/Feedback Received" section):

- Station 1: Where do you live? What is the most frequent type of trip taken from home? Where is the location of this most frequent trip taken from home?
- Station 2: How frequently do you travel to Lewiston-Auburn? For what purposes?
- Station 3: If train service were available between Lewiston-Auburn and Portland, would you ride it? For what purposes would you ride it?
- Station 4: What is the most you would pay for a one-way train ride between Lewiston-Auburn and Portland?
- Station 5: What would make your more likely to use the train?
- Station 6: Once at your desired station stop, how would you arrive at your destination?
- Station 7: Where else would you like to see a station?
- Station 8: Do you use the Downeaster? For what purposes?

An on-call interpretive service was available at the open house but there were no requests for interpretive service.

5.2.1 Who Attended?

Eight consultant team members were on hand for the open house, along with four members of the project committee (Patricia Quinn, Stephen Houdlette, Dick Grandmaison, and Mary Ann Hayes).



A total of 28 members of the public signed in to the open house. All attendees on the sign-in sheet resided in the greater Portland area.

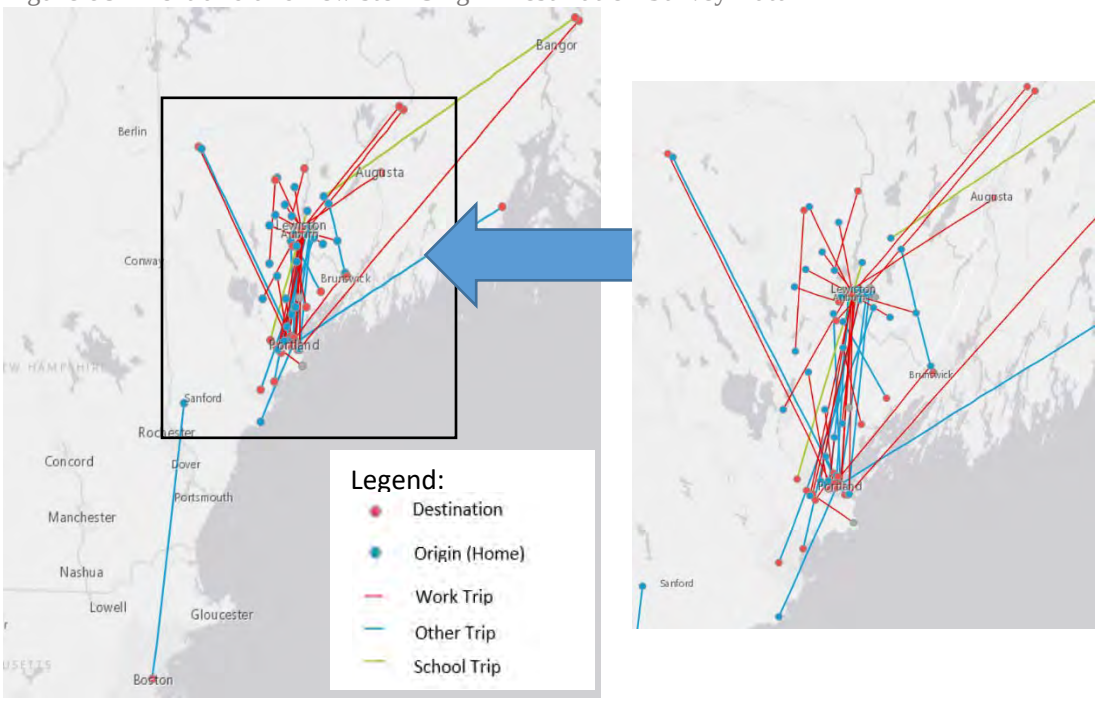
5.2.2 Data/Feedback Received

This section details the data received from Portland area residents at both the Portland and Lewiston open houses (except where noted). The data received from the two open houses was combined because Portland area residents were asked the same questions, regardless of which open house they attended.

Station 1: Where do you live? What is the most frequent type of trip taken from home? Where is the location of this most frequent trip taken from home?

Attendees were asked where they live, the most frequent type of trip taken from home, and the destination of that most frequent trip taken from home. Data was collected via tablets and uploaded into a web application for processing. Figure 68 below represents the data collected from both the Portland and Lewiston open houses by all attendees, regardless of residence location.

Figure 68 Portland and Lewiston Origin-Destination Survey Data



Note: The maps depicted above include data from Portland and Lewiston open houses

Station 2: How frequently do you travel to Lewiston-Auburn? For what purposes?

Attendees were asked how frequently they travel to Lewiston-Auburn and for what purposes using a dot voting exercise on a poster board. The raw number of responses is included as Table 33, while the percentage of responses is included as Table 34. Recreation/Cultural Events were defined as any type of leisure travel, including trips to festivals, concerts, visiting friends/family, and sporting events.

Table 33 Portland Open House: Frequency of Travel to L-A by Trip Type (Raw Numbers)

	Trip Types				
	Work	**School**	**Medical Appointments**	**Recreation / Cultural Events**	**Shopping**
Seldom (Less than once a month)	11	2	-	7	3
Infrequently (1 to 3 times per month)	4	-	3	5	2
Often (1 to 2 times per week)	3	-	1	3	1
Frequently (3 to 4 times per week)	2	-	-	-	-
Very frequently (5+ times per week)	4	-	-	2	1
TOTAL	24	2	4	17	7

Table 34 Portland Open House: Frequency of Travel to L-A by Trip Type (Percent)

	Trip Types				
	Work	**School**	**Medical Appointments**	**Recreation / Cultural Events**	**Shopping**
Seldom (Less than once a month)	46%	100%	0%	41%	43%
Infrequently (1 to 3 times per month)	17%	0%	75%	29%	29%
Often (1 to 2 times per week)	13%	0%	25%	18%	14%
Frequently (3 to 4 times per week)	8%	0%	0%	0%	0%
Very frequently (5+ times per week)	17%	0%	0%	12%	14%
TOTAL	100%	100%	100%	100%	100%

Comments received from the public included:

- "I would travel a lot more if there were passenger rail" (2 dots added)
- "Right now I'd travel Portland-Lewiston once per week. If the train was running I'd travel 2 times/week round trip."
- "What multi-modal facilities are going to be available" (1 dot added)

Station 3: If train service were available between Lewiston-Auburn and Portland, would you ride it? For what purposes would you ride it?

Attendees were asked if they would ride a train between Lewiston-Auburn and Portland and for what purposes using a dot voting exercise on a poster board. Yes or no answers to the first question were recorded in Figure 69, and the purposes they would ride it were recorded in Figure 70.

Figure 69 Portland Open House: If train service were available between Lewiston-Auburn and Portland, would you ride it?

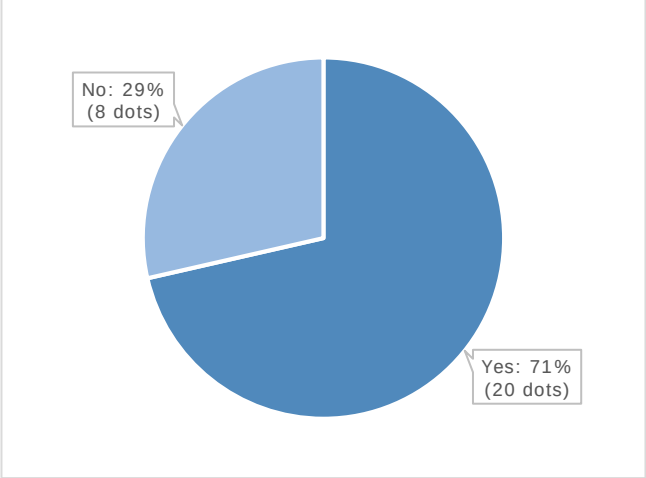
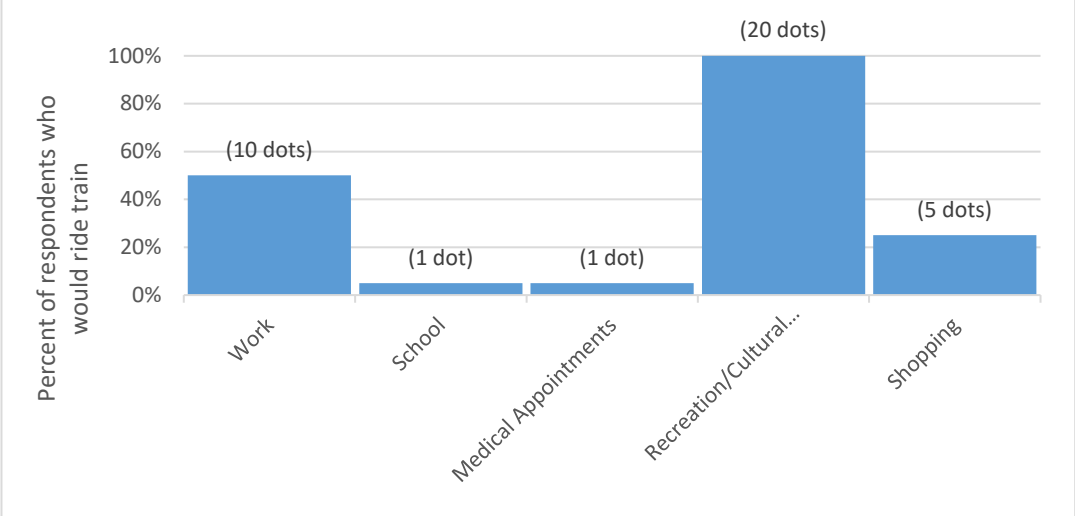


Figure 70 Portland Open House: For what purposes would you ride the train?



Note: Respondents were asked to choose all that apply

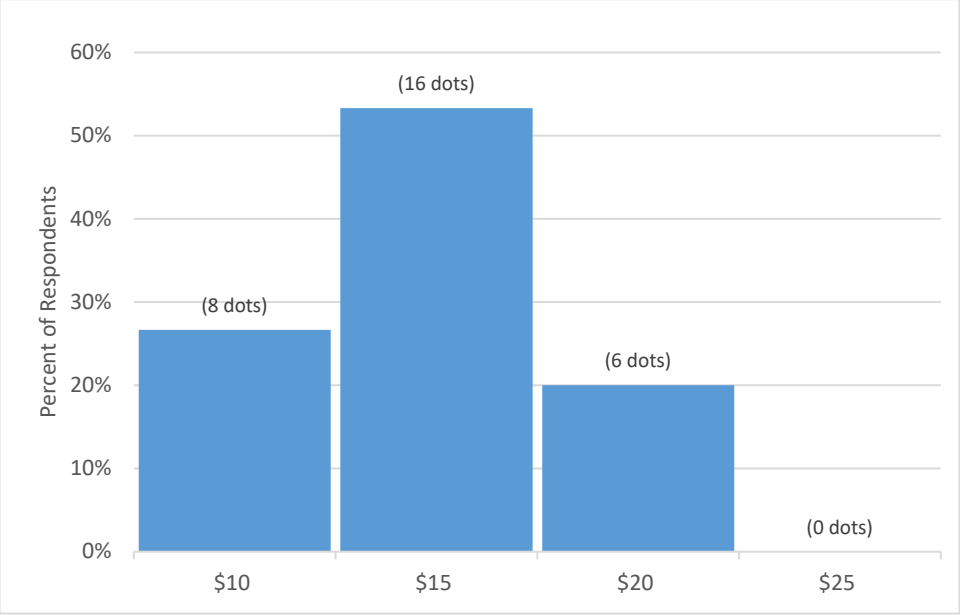
Attendees were also asked if they travel for any other reason. Comments from the public included:

- "I would use rail service to visit CMMC. Rainbow Bikes, Fuel Restaurant, and many other stores and restaurants"
- "I am unlikely to go to LA, but may travel to stops south (Yarmouth, E. Deering)"I (someone added a dot)
- "Can't answer w/o a cost for trips"

<u>Station 4:</u> What is the most you would pay for a one-way train ride between Lewiston-Auburn and Portland?

Attendees were asked what was the most they were willing to pay for a one-way train ride between Lewiston-Auburn and Portland using a dot voting exercise on a poster board. Their responses were recorded in Figure 71.

Figure 71 Portland Open House: What is the most you would pay for a one-way train ride between Lewiston-Auburn and Portland?



Comments from the public included:

- Comments under *Between Lewiston-Auburn and Portland?*
  - "$10 – Round Trip"

Station 5: What would make you more likely to use the train?

Attendees were asked what would make them more likely to use the train using a dot voting exercise on a poster board. The raw number of responses is included in Table 35, while the percentage of responses is included in Table 36.

Table 35 Portland Open House: Reasons to ride the train (Raw Numbers)

	On-board amenities	Proximity to destination	High frequency of service (Many trains per day)	Amenities at station	Lower cost than driving and parking	Travel time competitive to driving
1st (Most important)	2	14	21	-	6	2
2nd	-	3	5	-	3	9
3rd	2	6	1	3	6	4
4th	3	3	-	2	2	4
5th	8	-	-	3	2	2
6th (Least important)	3	-	-	11	1	1
TOTAL	18	26	27	19	20	22

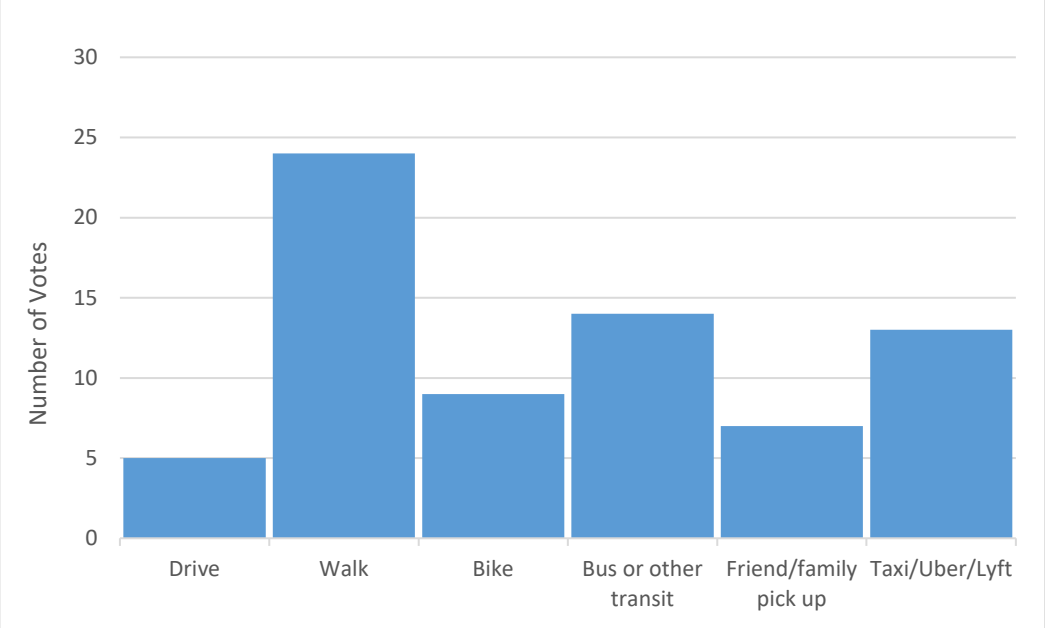
Table 36 Portland Open House: Reasons to ride train (Percent)

	On-board amenities	Proximity to destination	High frequency of service (Many trains per day)	Amenities at station	Lower cost than driving and parking	Travel time competitive to driving
1st (Most important)	11%	54%	78%	0%	30%	9%
2nd	0%	12%	19%	0%	15%	41%
3rd	11%	23%	4%	16%	30%	18%
4th	17%	12%	0%	11%	10%	18%
5th	44%	0%	0%	16%	10%	9%
6th (Least important)	17%	0%	0%	58%	5%	5%
TOTAL	100%	100%	100%	100%	100%	100%

Station 6: Once at your desired station stop, how would you arrive at your destination?

Attendees were asked how they would arrive at their destination after they reached their desired stop using a dot voting exercise on a poster board. Their responses were recorded in Figure 72.

Figure 72 Portland Open House: Once at your desired station stop, how would you arrive at your destination?



Note: Respondents were asked to choose all that apply

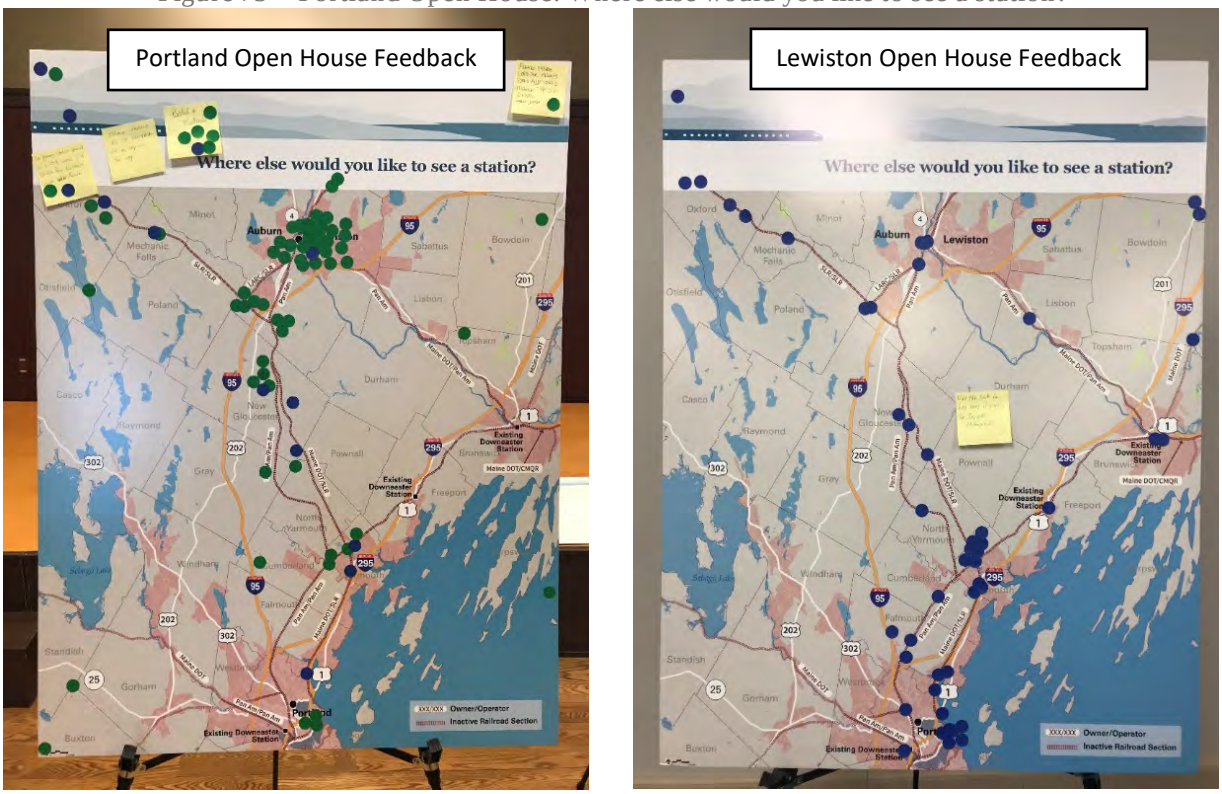
Comments from public included:

- "Assume that there is bike on train" (1 dot added)
- "Car share/bike share, all above"

Station 7: Where else would you like to see a station?

Attendees were asked in addition to stations in Lewiston-Auburn and Portland, where else they would like to see a station. Using a map on a poster board, attendees placed dots to indicate where else they would like to see a station. Since Portland residents attended open houses in both Lewiston and Portland, the results from this exercise are depicted in two boards (a separate board was used at each open house). The blue dots in the photos represent the feedback received from Portland area residents (the green dots in the Lewiston Open House board represent votes from those residing in the Northern Study Area). Pictures of these boards are included in Figure 73.

Figure 73 Portland Open House: Where else would you like to see a station?



Note: 1. Green dots denote feedback received from Northern Study Area residents

2. Blue dots denote feedback received from Portland residents

Comments from public included:

- "Use the SLR to help keep it viable for freight restoration"

Station 8: Do you use the Downeaster? For what purposes?

Attendees were asked if they use the Downeaster and for what purposes using a dot voting exercise on a poster board. Yes or no answers to the first question were recorded in Figure 74, and the purposes they ride the Downeaster were recorded in Figure 75.

Figure 74 Portland Open House: Do you use the Downeaster?

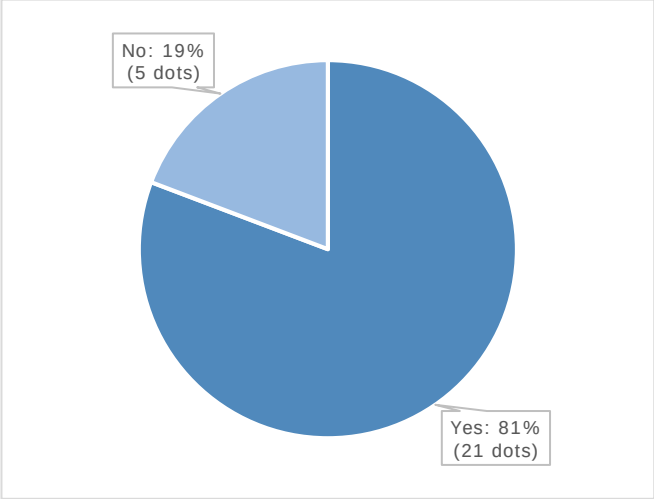
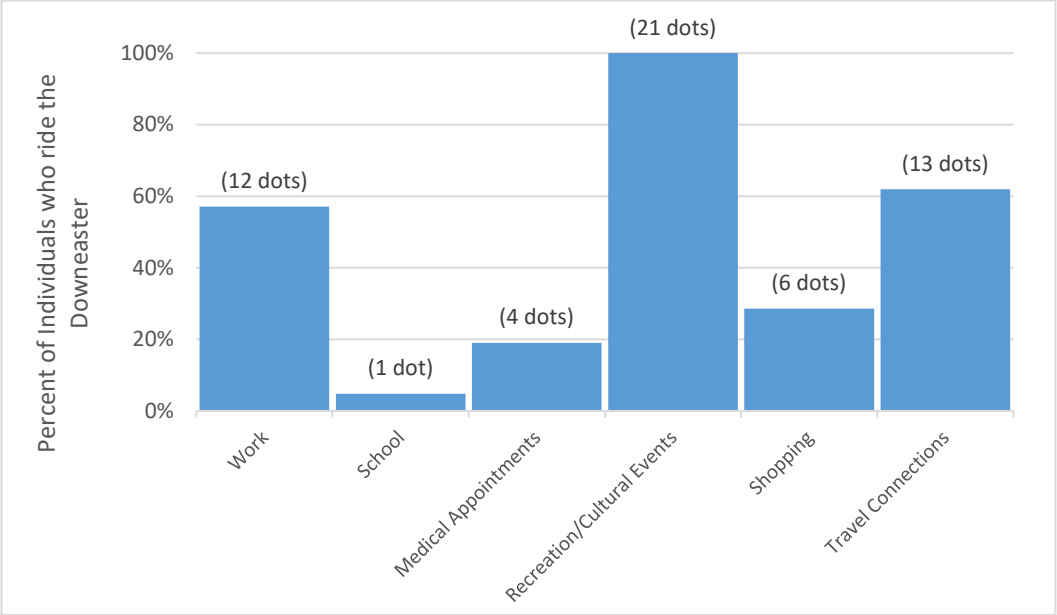


Figure 75 Portland Open House: For what purposes do you use the Downeaster?



Note: Respondents were asked to choose all that apply

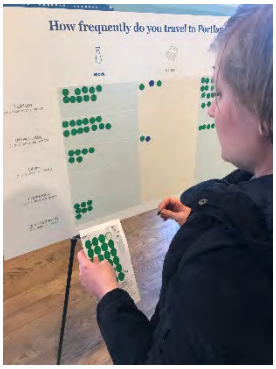
Comments from public included:

- Comments under *Do you travel for any other reason?*:
  - "meetings in Boston. Also meetings in NYC"
  - "NY or DC meetings always by Amtrak from Boston"
- General comments included:
  - "Trolley Service to Waterfront. ↓ Traffic ↑ Business Win win!"

5.3 Lewiston Open House

The Lewiston Open House was held on Wednesday, March 28, 2018 from 4:30 PM to 6:30 PM at Lewiston Public Library, Callahan Hall (200 Lisbon St, Lewiston, ME 04240).

This open house was used to provide the public with information on the Lewiston-Auburn Passenger Rail Project and to solicit input from the public on their travel patterns/preferences via dot voting on boards and a tablet survey. Specifically, there were ten stations where attendees were asked the following questions (a detailed summary of attendee responses is included in the "Data/Feedback Received" section):



- Station 1: Where do you live? What is the most frequent type of trip taken from home? Where is the location of this most frequent trip taken from home?
- Station 2: How frequently do you travel to Portland? For what purposes?
- Station 3: How frequently do you travel to Boston? For what purposes?
- Station 4: If train service were available between Lewiston-Auburn and Portland, would you ride it? For what purposes would you ride it?
- Station 5: If train service were available between Lewiston-Auburn and Boston, would you ride it? For what purposes would you ride it?
- Station 6: What is the most you would pay for a one-way train ride? (Between Lewiston-Auburn and Portland, Between Lewiston-Auburn and Boston)
- Station 7: What would make your more likely to use the train?
- Station 8: Once at your desired station stop, how would you arrive at your destination?
- Station 9: Where else would you like to see a station?
- Station 10: Do you use the Downeaster? For what purposes?

An on-call interpretive service was available at the open house but there were no requests for interpretive service.

5.3.1 Who Attended?

Ten consultant team members were on hand for the open house, along with seven project committee members (Patricia Quinn, Stephen Houdlette, Rep. Golden, Rep. Sheats, Lincoln Jeffers, Dick Grandmaison, and Bob Stone). A total of 90 members of the public signed in to the open house. The majority of those who signed in (82 people) resided in the Northern Study Area (Lewiston-Auburn and surrounding communities). The remaining people who signed in (8 people) resided in the greater Portland area.

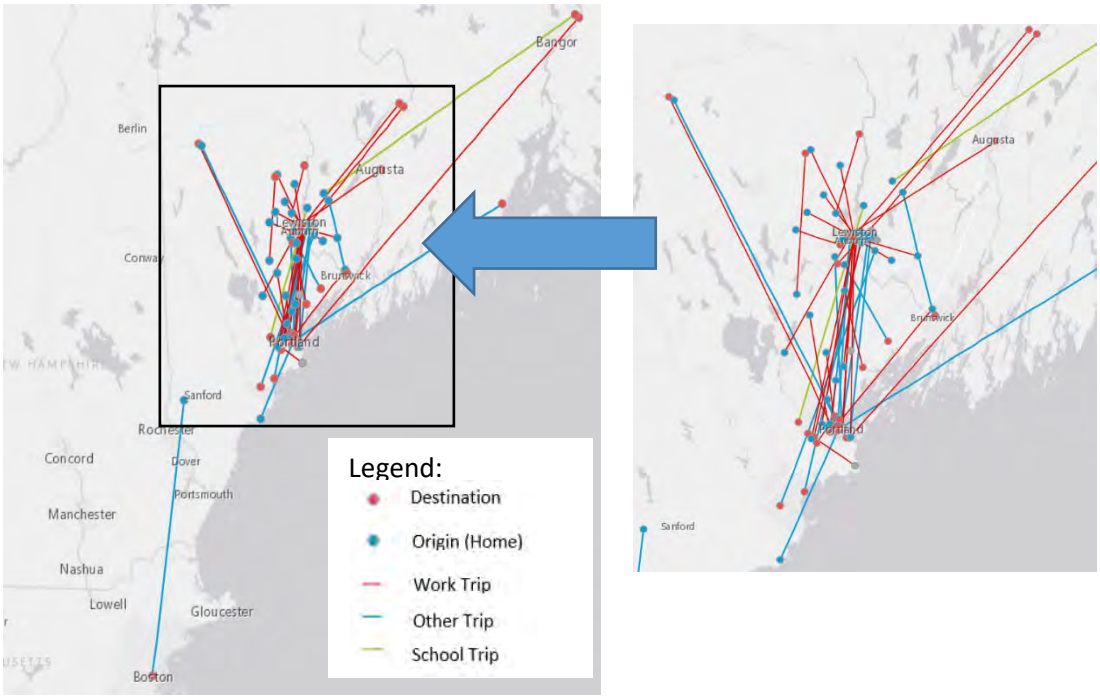
5.3.2 Data/Feedback Received

This section details the data received from the Northern Study Area residents at both the Portland and Lewiston open houses (except where noted). The data received from the two open houses was combined because Northern Study Area residents were asked the same questions, regardless of which open house they attended.

<u>Station 1:</u> Where do you live? What is the most frequent type of trip taken from home? Where is the location of this most frequent trip taken from home?

Attendees were asked where they live, the most frequent type of trip taken from home, and the destination of that most frequent trip taken from home. Data was collected via tablets and uploaded into a web application for processing. Figure 68 represents the data collected from both the Portland and Lewiston open houses by all attendees, regardless of residence location.

Figure 68 Portland and Lewiston Origin-Destination Survey Data Collected



Note: The maps depicted above include data from Portland and Lewiston open houses

Station 2: How frequently do you travel to Portland? For what purposes?

Attendees were asked how frequently they travel to Portland and for what purposes using a dot voting exercise on a poster board. The raw number of responses is included in Table 37, while the percentage of responses is included in Table 38. Recreation/Cultural Events were defined as any type of leisure travel, including trips to festivals, concerts, visiting friends/family, and sporting events. Travel connections were defined as trips taken to connect to another travel mode in Portland (airport, intercity bus, or train).

Table 37 Lewiston Open House: Frequency of Travel to Portland by Trip Type (Raw Numbers)

	Trip Types					
	Work	School	Medical Appointments	Recreation/ Cultural Events	Shopping	Travel Connections
Seldom (Less than once a month)	14	3	17	19	23	34
Infrequently (1 to 3 times per month)	17	-	3	30	21	19
Often (1 to 2 times per week)	7	1	5	17	18	7
Frequently (3 to 4 times per week)	-	-	-	4	1	2
Very frequently (5+ times per week)	7	-	-	-	-	-
TOTAL	45	4	25	70	63	62

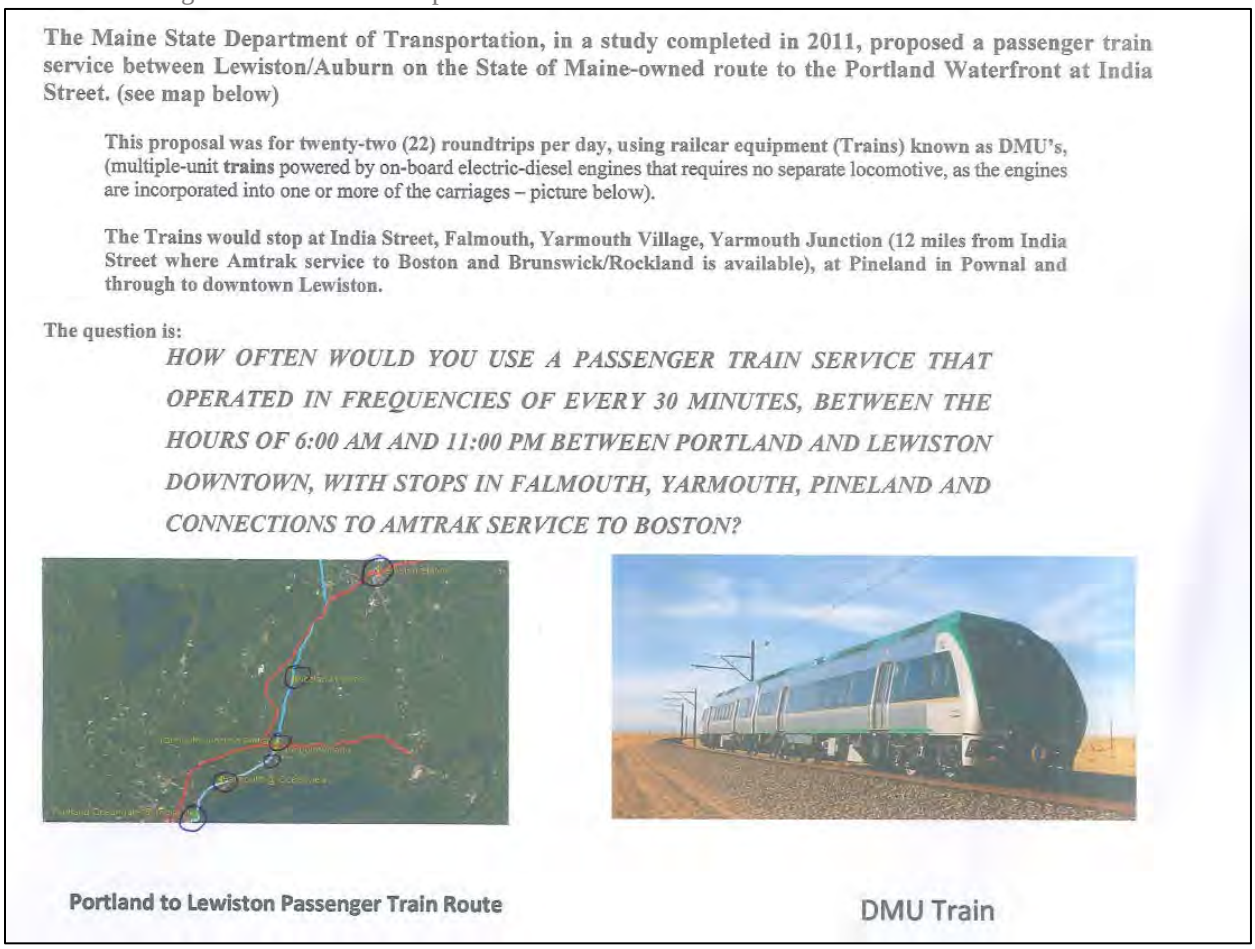
Table 38 Lewiston Open House: Frequency of Travel to Portland by Trip Type (Percent)

	Trip Types					
	Work	School	Medical Appointments	Recreation/ Cultural Events	Shopping	Travel Connections
Seldom (Less than once a month)	31%	75%	68%	27%	37%	55%
Infrequently (1 to 3 times per month)	38%	0%	12%	43%	33%	31%
Often (1 to 2 times per week)	16%	25%	20%	24%	29%	11%
Frequently (3 to 4 times per week)	0%	0%	0%	6%	2%	3%
Very frequently (5+ times per week)	16%	0%	0%	0%	0%	0%
TOTAL	100%	100%	100%	100%	100%	100%

Attendees were also asked if they travel for any other reason. Comments received from the public included a typed document (see Figure 76) and the following written on Post it Notes:

- "Bethel – Skiing/White Mtns./Other Recreation"
- "Connection to Brunswick?"
- "Bates College runs a shuttle between campus and Portland – is this considered?"
- "Visit friends and family" (five people added dots for this comment)

Figure 76 Lewiston Open House: Document attached to board at Station 2



<u>Station 3:</u> How frequently do you travel to Boston? For what purposes?

Attendees were asked how frequently they travel to Boston and for what purposes using a dot voting exercise on a poster board. The raw number of responses is included in Table 39, while the percentage of responses is included in Table 40. Recreation/Cultural Events were defined as any type of leisure travel, including trips to festivals, concerts, visiting friends/family, and sporting events. Travel connections were defined as trips taken to connect to another travel mode in Boston (airport, intercity bus, or train).

Table 39 Lewiston Open House: Frequency of Travel to Boston by Trip Type (Raw Numbers)

	Trip Types					
	Work	School	Medical Appointments	Recreation/ Cultural Events	Shopping	Travel Connections
Seldom (Less than once a month)	14	-	5	49	12	46
Infrequently (1 to 3 times per month)	6	-	2	15	5	10
Often (1 to 2 times per week)	1	-	-	1	1	2
Frequently (3 to 4 times per week)	1	-	-	1	1	-
Very frequently (5+ times per week)	-	-	-	-	-	-
TOTAL	22	-	7	66	19	58

Table 40 Lewiston Open House: Frequency of Travel to Boston by Trip Type (Percent)

	Trip Types					
	Work	School	Medical Appointments	Recreation/ Cultural Events	Shopping	Travel Connections
Seldom (Less than once a month)	64%	0%	71%	74%	63%	79%
Infrequently (1 to 3 times per month)	27%	0%	29%	23%	26%	17%
Often (1 to 2 times per week)	5%	0%	0%	2%	5%	3%
Frequently (3 to 4 times per week)	5%	0%	0%	2%	5%	0%
Very frequently (5+ times per week)	0%	0%	0%	0%	0%	0%
TOTAL	100%	0%	100%	100%	100%	100%

Station 4: If train service were available between Lewiston-Auburn and Portland, would you ride it? For what purposes would you ride it?

Attendees were asked if they would ride a train between Lewiston-Auburn and Portland and for what purposes using a dot voting exercise on a poster board. Yes or no answers to the first question were recorded in Figure 77, and the purposes they would ride it were recorded in Figure 78. Recreation/Cultural Events were defined as any type of leisure travel, including trips to festivals, concerts, visiting friends/family, and sporting events. Travel connections were defined as trips taken to connect to another travel mode in Portland (airport, intercity bus, or train).

Figure 77 Lewiston Open House: If train service were available between Lewiston-Auburn and Portland, would you ride it?

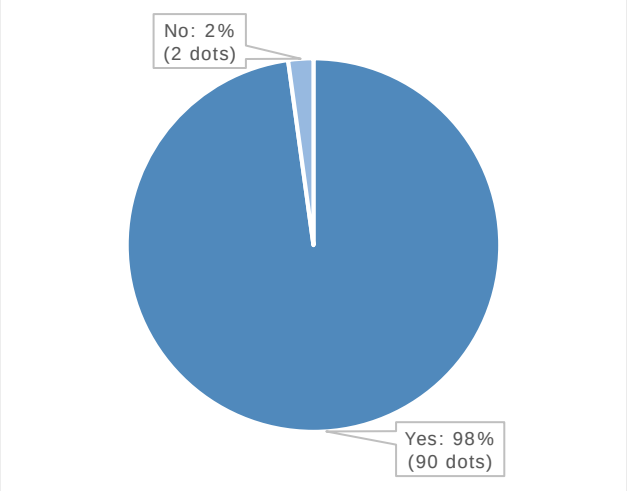
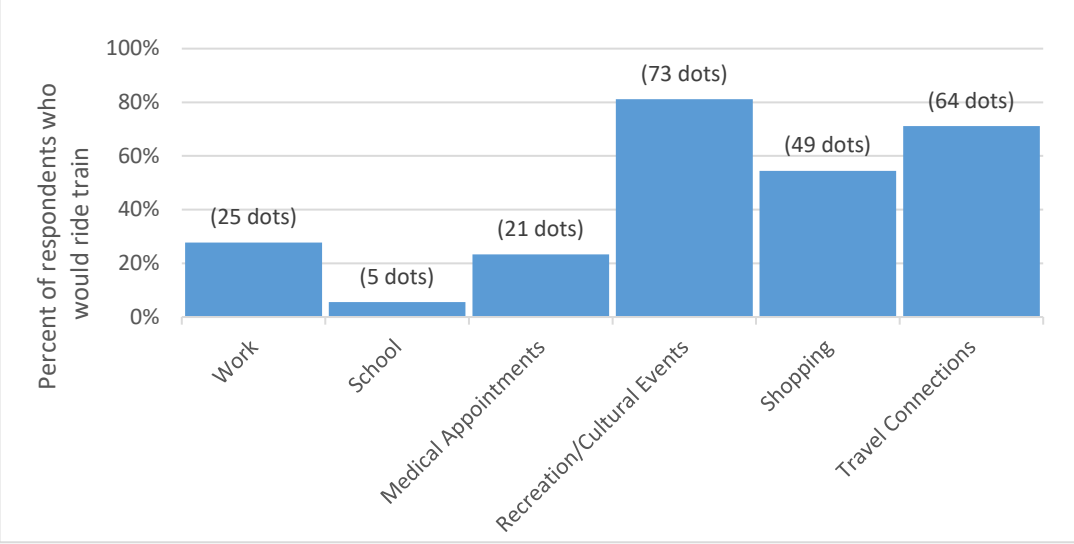


Figure 78 Lewiston Open House: For what purposes would you ride it?



Note: Respondents were asked to choose all that apply

Comments from the public included a typed letter (see Figure 79) and the following written on Post it Notes:

- Comments under *If train service were available between Lewiston-Auburn and Portland, would you ride it?* (in the *Yes* box):
    - "Some older people want to travel but can't drive a car" (someone else responded to this comment with "Great point!")
    - "Portland real estate high: train would allow better connection to work in Portland"
    - "Congressman Poliquin would write a support letter for funding"
- Comments under *For what purposes would you ride it?:*
    - "Being unable to drive for medical reasons, rail service to L-A would expand my social and economic options. Currently a lack of rail service is limiting on job opportunities and networking."
    - "Get extra passengers by promoting to rail fans. To them the journey is the destination."
    - "Train would also help those of us who are bad with directions."
    - "We employ 40+ people. About 1/3 commute from Portland area to Lewiston. Train would open up huge opportunities."

Figure 79 Lewiston Open House: Document attached to board at Station 4

CommunityConcepts

South Paris
17-19 Market Sq.
PO Box 278
S. Paris, ME 04281
(207) 743-7716
Fax: 743-6513

Lewiston
240 Bates Street
Lewiston, ME 04240
795-4065

Wilton
284 Main Street
Wilton, ME 04924
(207) 645-9512
Fax: 645-2609

Public Transportation Addressing the Needs of Low-Income People

Since 1965 Community Concepts, Inc. has offered a variety of housing, economic development and social services for the communities in Androscoggin, Franklin and Oxford Counties of Maine. Our services support the basic needs of low income families and promote self-sufficiency.

Our mission is to strengthen individuals, families and communities in Western Maine by providing diverse programs, by engaging in strategic partnerships, and through advocacy that addresses the barriers to promote economic opportunities for all.
One of the services that CCI provides is free transportation for medical appointments, cancer treatment, kidney dialysis and for everyday needs, such as groceries, laundromat, bank, and more. Our transportation services are available to anyone who is 60+ years of age, low income, a cancer patient and/or a veteran. Others can use the program for a modest fee.

We provide 600-1000 trips per day to a range of destinations. We rely on volunteers who use their vehicles to provide this service and we reimburse them for their mileage. For many of our clients, their transportation needs are greater than what we can offer them, especially if they need daily transportation to work and for children to childcare, for example.

A Community Needs Assessment CCI commissioned in 2016 indicates that 1 in 11 households in our primary service area (7,170 people), and 1 in 6 in Lewiston-Auburn (4,211 people), do not own a car. The proportions are highest among young households and older households.

Furthermore, the Maine Department of Transportation estimates that current transportation programs only met 14% of the need in 2012.

Public transit can be a ride out of poverty. A Harvard University study (Raj Chetty and Nathaniel Hendren, 2015) has identified access to public transportation as one of the most important factors that provide a person with the opportunity and the highest chances of moving from the bottom fifth to the top fifth of income across generations. Providing residents in the L/A area who do not own a car with the option of riding the train to Portland and beyond expands their options for employment, education and medical treatment. Furthermore, we need public transportation, like the train, that stops in the center city and offers a schedule of trips to accommodate jobs that require working evening or weekend hours.

C. Shawn Yardley
Chief Executive Officer

Transportation Community Services Children's Services Family Services Housing & Property Management

Station 5: If train service were available between Lewiston-Auburn and Boston, would you ride it? For what purposes would you ride it?

Attendees were asked if they would ride a train between Lewiston-Auburn and Boston and for what purposes using a dot voting exercise on a poster board. Yes or no answers to the first question were recorded in Figure 80, and the purposes they would ride it were recorded in Figure 81. Recreation/Cultural Events were defined as any type of leisure travel, including trips to festivals, concerts, visiting friends/family, and sporting events. Travel connections were defined as trips taken to connect to another travel mode in Boston (airport, intercity bus, or train).

Figure 80 Lewiston Open House: If train service were available between Lewiston-Auburn and Boston, would you ride it?

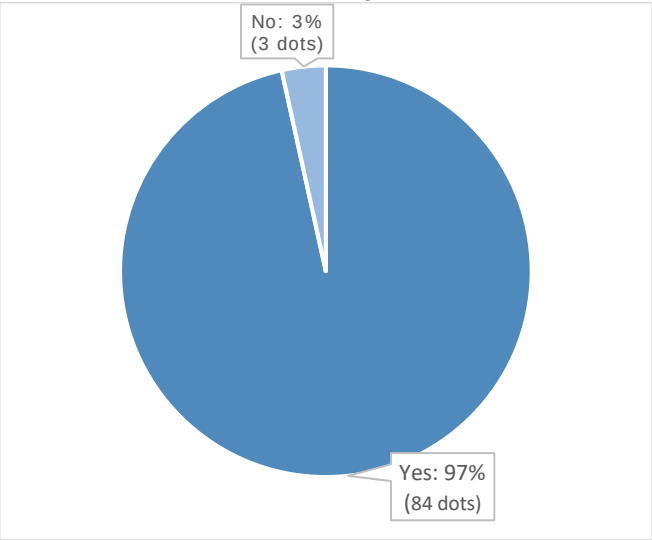
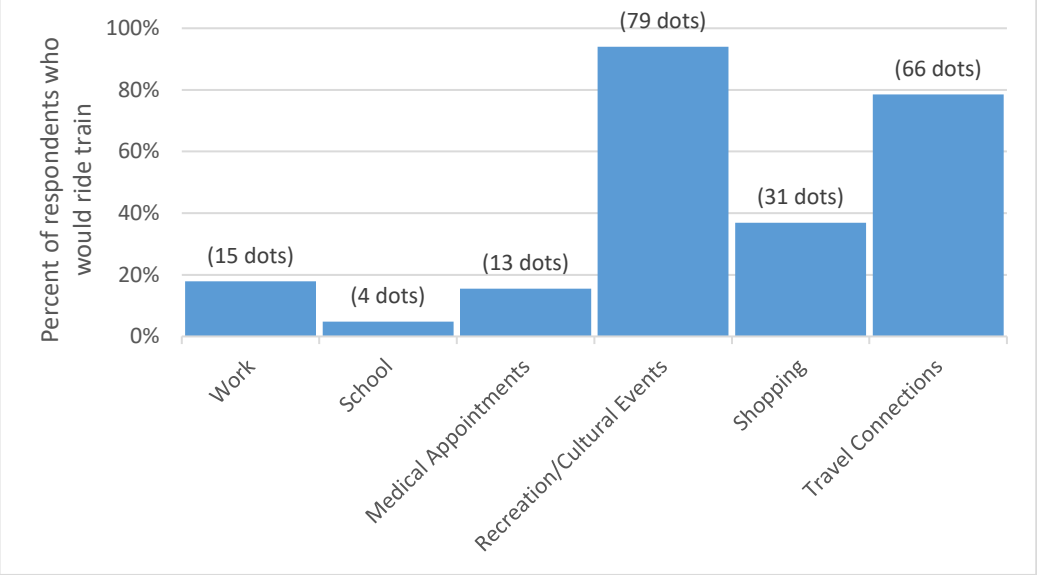


Figure 81 Lewiston Open House: For what purposes would you ride it?



Note: Respondents were asked to choose all that apply

Attendees were also asked if they travel for any other reason. Comments from the public included:

- "Events ranging from sporting to comic/geek culture. Going both directions, people going south as well as others coming north." (2 dots added)
- "Family and friends" (5 dots added)
- "Academic or professional conference" (1 dot added)

Station 6: What is the most you would pay for a one-way train ride? (Between Lewiston-Auburn and Portland, Between Lewiston-Auburn and Boston)

Attendees were asked what was the most they were willing to pay for one-way train rides between Lewiston-Auburn and Portland or Boston using a dot voting exercise on a poster board. Their responses were recorded in Figure 82 and Figure 83, respectively.

Figure 82 Lewiston Open House: What is the most you would pay for a one-way train ride between Lewiston-Auburn and Portland?

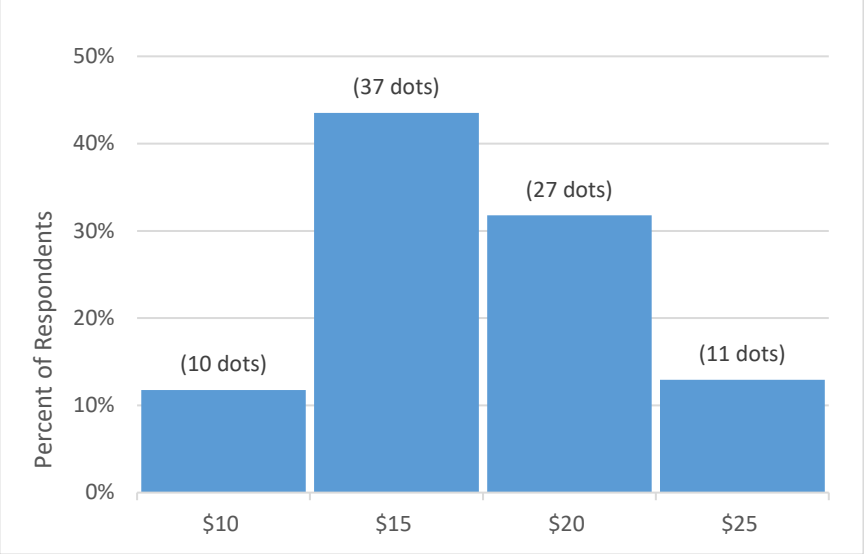
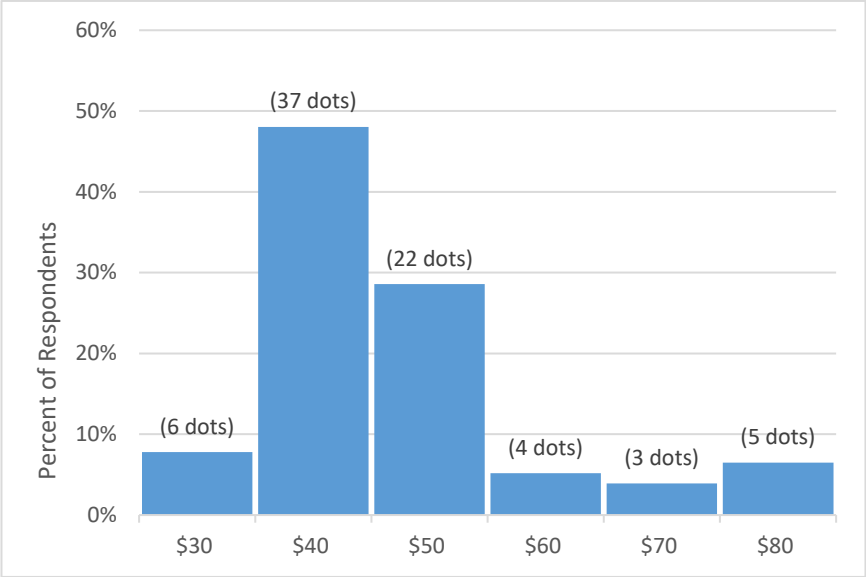


Figure 83 Lewiston Open House: What is the most you would pay for a one-way train ride between Lewiston-Auburn and Boston?



Comments from the public included:

- Comments under *$15 between Lewiston-Auburn and Portland*
  - "from/to Yarmouth"
- Comments under *$20 between Lewiston-Auburn and Portland*
  - "Too much money for a one-way ticket"
  - "$20 for a round trip ok"
- General comments included:
  - "Some sort of frequent rider prices essential" (2 people added dots)

Station 7: What would make you more likely to use the train?

Attendees were asked what would make them more likely to use the train using a dot voting exercise on a poster board. The raw number of responses is included in Table 41, while the percentage of responses is included in Table 42.

Table 41 Lewiston Open House: Reasons to Ride the Train (Raw Numbers)

	On-board amenities	Proximity to destination	High frequency of service (Many trains per day)	Amenities at station	Lower cost than driving and parking	Travel time competitive to driving	Direct train to Boston
1st (Most important)	1	26	30	1	23	5	21
2nd	3	24	22	1	17	14	8
3rd	18	3	13	1	12	14	6
4th	11	5	8	-	9	10	13
5th	6	2	3	3	5	8	10
6th	17	3	1	6	4	6	5
7th (Least important)	8	1	-	31	-	2	1
TOTAL	64	64	77	43	70	59	64

Table 42 Lewiston Open House: Reasons to Ride the Train (Percent)

	On-board amenities	Proximity to destination	High frequency of service (Many trains per day)	Amenities at station	Lower cost than driving and parking	Travel time competitive to driving	Direct train to Boston
1st (Most important)	2%	41%	39%	2%	33%	8%	33%
2nd	5%	38%	29%	2%	24%	24%	13%
3rd	28%	5%	17%	2%	17%	24%	9%
4th	17%	8%	10%	0%	13%	17%	20%
5th	9%	3%	4%	7%	7%	14%	16%
6th	27%	5%	1%	14%	6%	10%	8%
7th (Least important)	13%	2%	0%	72%	0%	3%	2%
TOTAL	100%	100%	100%	100%	100%	100%	100%

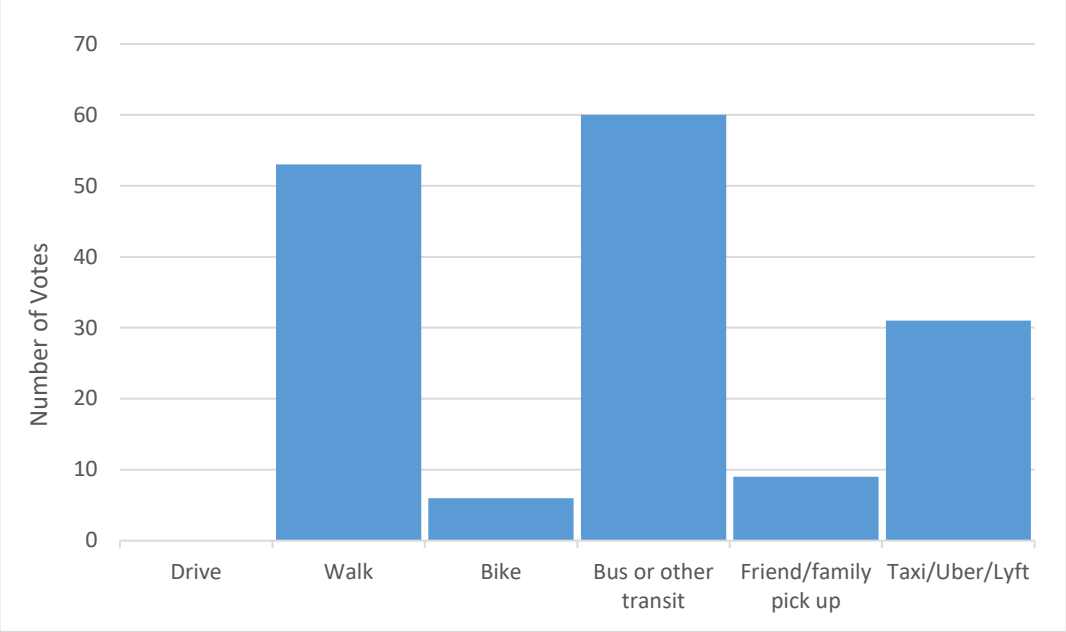
Comments from the public included:

- Comments under *Proximity to destination*
  - "Proximity to origin as well"
- Comments under *Lower cost than driving and parking*
  - "Convenience more than cost" (2 dots added)
- Comments under *Travel time competitive to driving*
  - "A reliable service that's at least comparable to how fast I could drive" (1 dot added)
- Comments under *Direct train to Boston*
  - "multi-modal ? facilities" (1 dot added)
  - "If round trip – must be able to get one after the event" (2 dots added)
- General comments included:
  - "Vehicle Parking: Safe, Close by, Low Cost, = High Importance"

Station 8: Once at your desired station stop, how would you arrive at your destination?

Attendees were asked how they would arrive at their destination after they reached their desired stop using a dot voting exercise on a poster board. Their responses were recorded in Figure 84.

Figure 84 Lewiston Open House: Once at your desired station stop, how would you arrive at your destination?



Note: Respondents were asked to choose all that apply

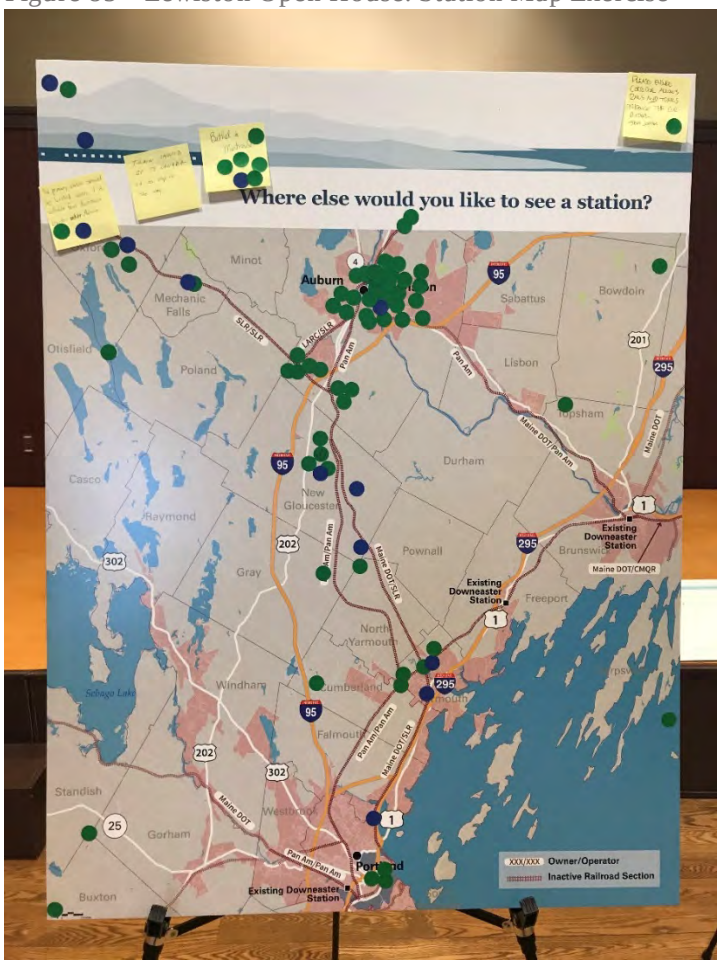
Comments from the public included:

- "Need bikes on board guarantee" (2 dots added)
- "Want to preserve trail w/ rail opportunity" (1 dot added)

Station 9: Where else would you like to see a station?

Attendees were asked in addition to stations in Lewiston-Auburn and Portland, where else they would like to see a station. Using a map on a poster board, attendees placed dots to indicate where else they would like to see a station. Green dots were placed by attendees that resided in the Northern Study Area while blue dots were placed by attendees that resided in the greater Portland area. A picture of this board was included in Figure 85.

Figure 85 Lewiston Open House: Station Map Exercise



Note: 1. Green dots denote feedback received from Northern Study Area residents

2. Blue dots denote feedback received from Portland residents

Comments from the public included:

- "Please ensure corridor allows rails and trails through the corridor" (1 dot added)
- "The primary station should be located where it is walkable from downtown Lewiston and/or Auburn" (2 dots added)
- "Train should go to Canada – LA as stop on the way"
- "Bethel and Montreal" (4 dots added)

Station 10: Do you use the Downeaster? For what purposes?

Attendees were asked if they use the Downeaster and for what purposes using a dot voting exercise on a poster board. Yes or no answers to the first question were recorded in Figure 86, and the purposes they ride the Downeaster were recorded in Figure 87. Recreation/Cultural Events were defined as any type of leisure travel, including trips to festivals, concerts, visiting friends/family, and sporting events. Travel connections were defined as trips taken to connect to another travel mode (airport, intercity bus, or Amtrak Northeast Corridor).

Figure 86 Lewiston Open House: Do you use the Downeaster?

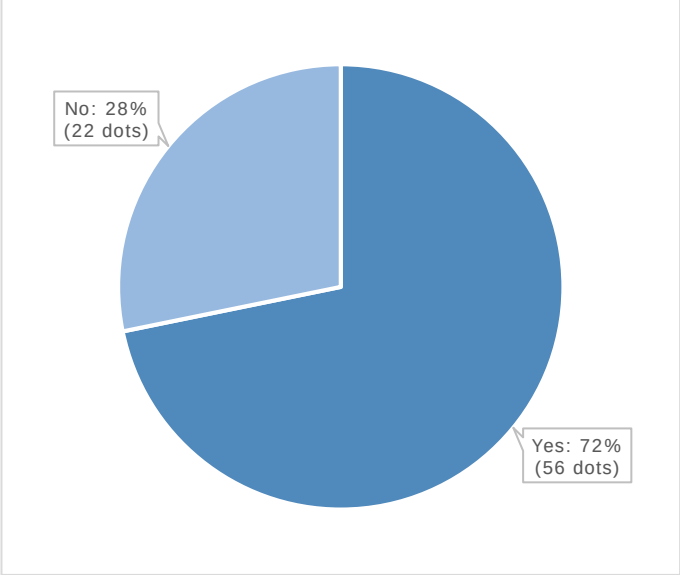
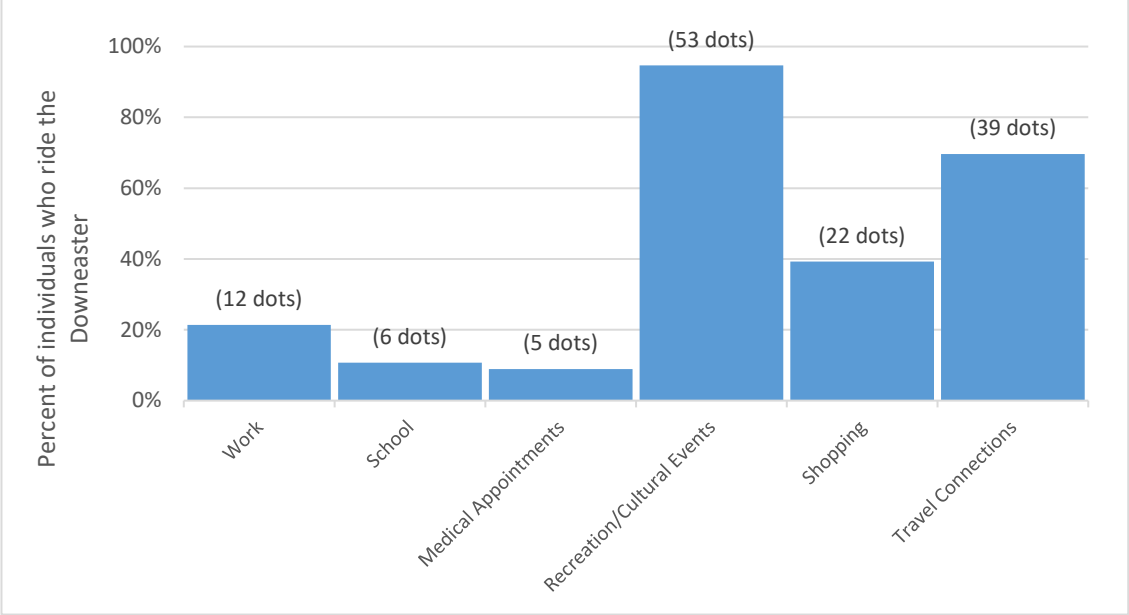


Figure 87 Lewiston Open House: For what purposes do you use the Downeaster?



Note: Respondents were asked to choose all that apply

Comments from the public included:

- Comments under *Do you use the Downeaster?* (in the *No* box):
  - "Train way too slow to Boston. Now I take the bus or I drive." (1 dot added)
  - "North-South Rail Link missing. A Link would make this better connection." (1 dot added)
  - "2x – inconvenient to come into North Station" (1 dot added)
- Comments under *Do you travel for any other reason?*:
  - "Used it a couple years ago to help a client learn to travel to work on his own."
  - "For an academic conference"
- General comments included:
  - "Glad to see this as a real possibility. We need this."
  - "Am a: Big advocate of passenger rail: travel, economic, environmental, nostalgia, convenience, transport connection to CT (family)"

5.4 Online Survey

In addition to the two open houses, an online survey was established to solicit input from individuals who were unable to attend one of the open houses. This survey was administered using Survey Monkey and asked questions similar to the ones asked at the open houses. The survey was opened on Thursday, March 29, 2018, the day after the last open house. It was closed on Friday, April 20, 2018. Altogether, a total of 502 people responded to the survey.

This section summarizes the results obtained from the survey for both respondents residing in Portland and the Northern Study Area.

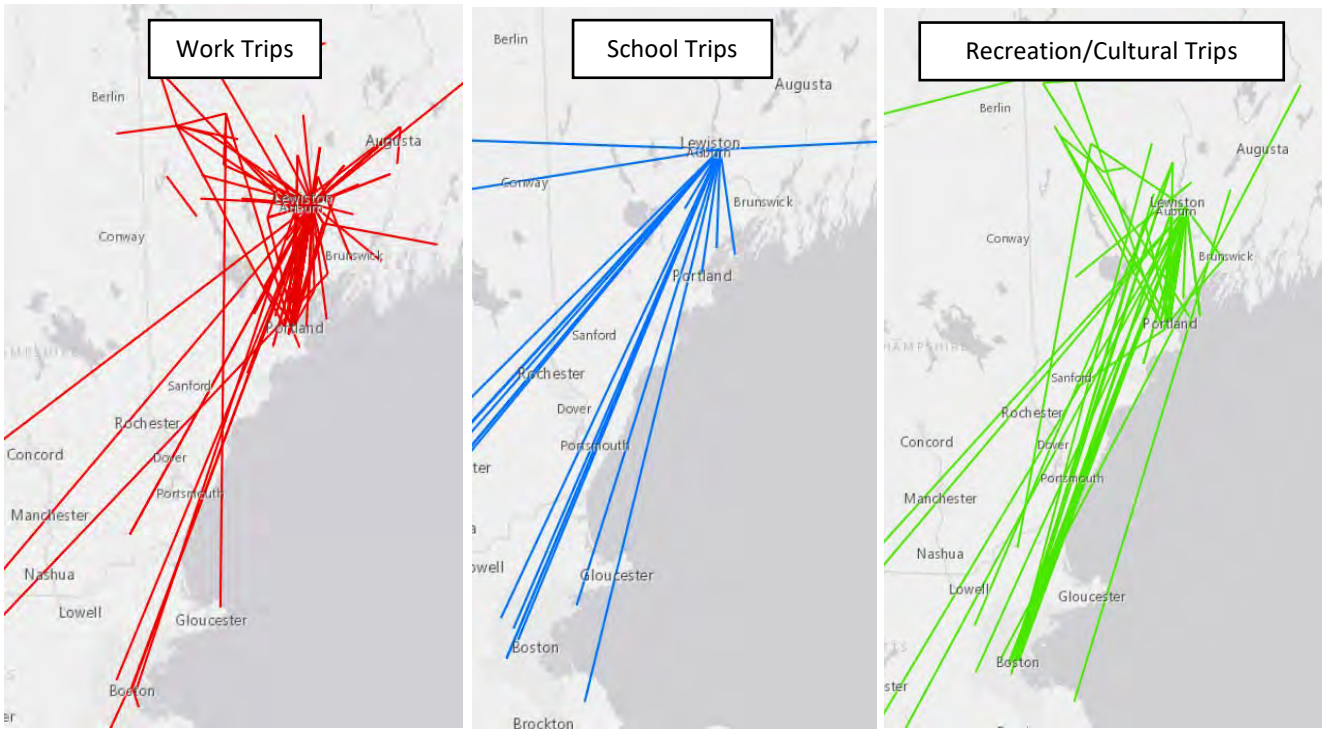
5.4.1 Data/Feedback Received from Portland Residents

This section details the online survey data received from Portland residents (except where noted). Results are separated by questions, indicated by the bold text.

Where do you live? What is the most frequent type of trip taken from home? Where is the location of this most frequent trip taken from home?

Survey respondents were asked where they live, the most frequent type of trip taken from home, and the destination of that most frequent trip taken from home. Data from the survey was uploaded into a web application for processing. Figure 88 represents the data collected from both Portland and Northern Study Area residents.

Figure 88 Online Survey: Work, School, and Recreation/Cultural Trips



Note: The maps depicted above include data from Portland and Northern Study Area residents

How frequently do you travel to Lewiston-Auburn? For what purposes?

Survey respondents were asked how frequently they travel to Lewiston-Auburn and for what purposes. The results are included as Table 43. Recreation/Cultural Events were defined as any type of leisure travel, including trips to festivals, concerts, visiting friends/family, and sporting events.

Table 43 Online Survey (Portland): Frequency of Travel to L-A by Trip Type

	Trip Type				
	Work	School	Medical Appointments	Recreation/ Cultural Events	Shopping
No Response	27.9%	51.2%	39.5%	30.2%	27.9%
Seldom (Less than once a month)	9.3%	41.9%	44.2%	23.3%	46.5%
Infrequently (1 to 3 times per month)	14.0%	0.0%	16.3%	37.2%	18.6%
Often (1 to 2 times per week)	4.7%	0.0%	0.0%	7.0%	4.7%
Frequently (3 to 4 times per week)	11.6%	7.0%	0.0%	2.3%	2.3%
Very frequently (5+ times per week)	32.6%	0.0%	0.0%	0.0%	0.0%
TOTAL	100%	100%	100%	100%	100%

If train service were available between Lewiston-Auburn and Portland, would you ride it? For what purposes would you ride it?

Survey respondents were asked if they would ride a train between Lewiston-Auburn and Portland. Yes or no answers to the first question were recorded in Figure 89, and the purposes they would ride it were recorded in Figure 90.

Figure 89 Online Survey (Portland): If train service were available between Lewiston-Auburn and Portland, would you ride it?

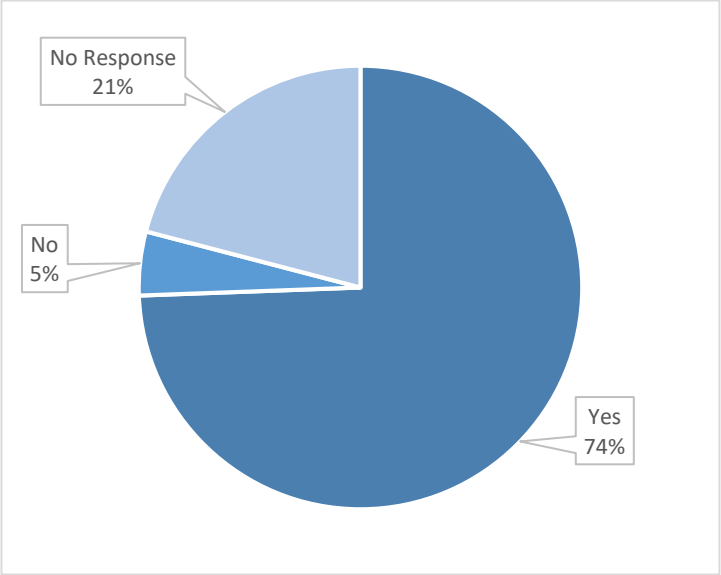
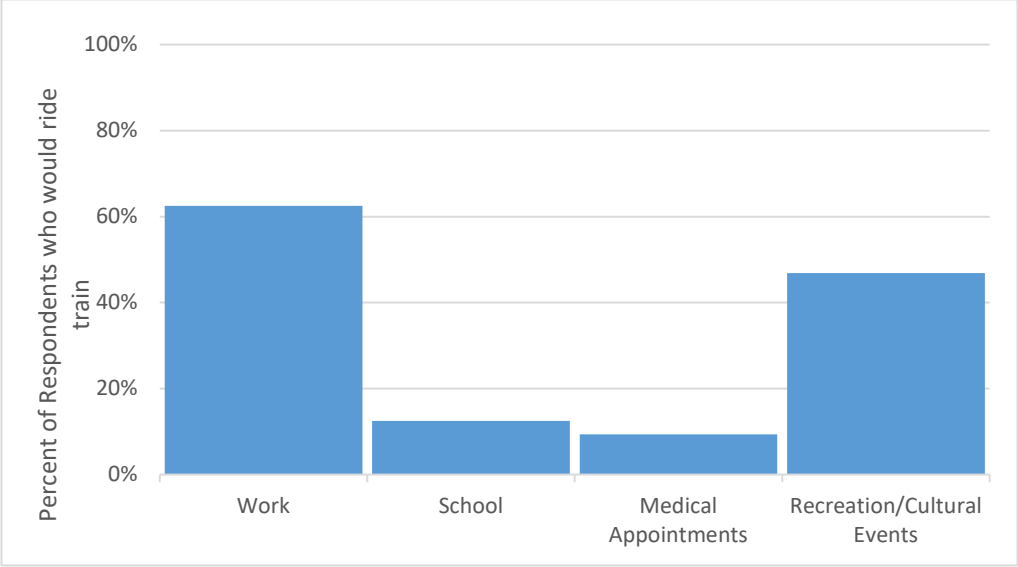


Figure 90 Online Survey (Portland): For what purposes would you ride the train?

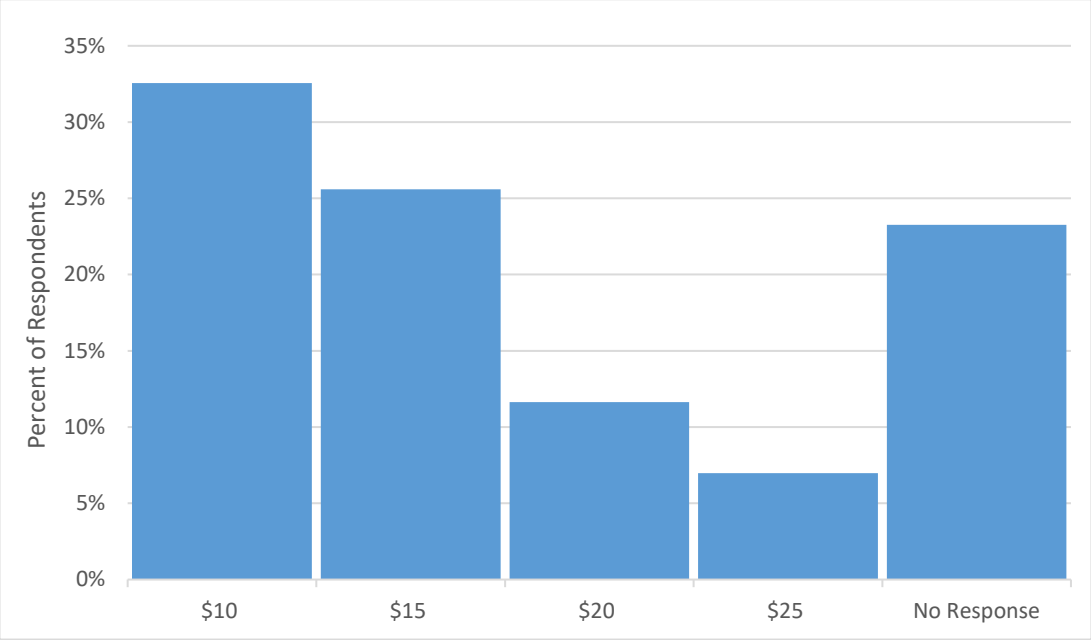


Note: Respondents were asked to choose all that apply

What is the most you would pay for a one-way train ride between Lewiston-Auburn and Portland?

Survey respondents were asked what was the most they were willing to pay for a one-way train ride between Lewiston-Auburn and Portland. Their responses were recorded in Figure 91.

Figure 91 Online Survey (Portland): What is the most you would pay for a one-way train ride between Lewiston-Auburn and Portland?



What would make you more likely to use the train?

Survey respondents were asked what would make them more likely to use the train. Their responses are included in Table 44.

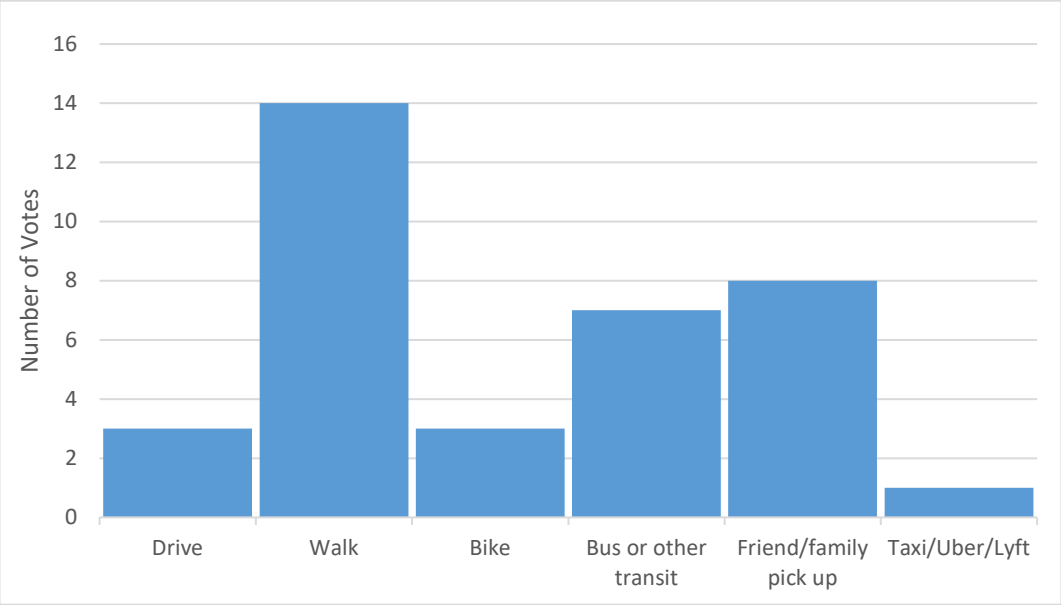
Table 44 Online Survey (Portland): Reasons to ride the rain

	On-board amenities	Proximity to destination	High frequency of service (Many trains per day)	Amenities at station	Lower cost than driving and parking	Travel time competitive to driving
1st (Most important)	3%	31%	38%	3%	22%	6%
2nd	13%	34%	16%	3%	19%	15%
3rd	9%	9%	19%	6%	16%	39%
4th	3%	9%	9%	19%	28%	30%
5th	50%	16%	6%	16%	9%	3%
6th (Least important)	22%	0%	13%	52%	6%	6%
TOTAL	100%	100%	100%	100%	100%	100%

Once at your desired station stop, how would you arrive at your destination?

Survey respondents were asked how they would arrive at their destination after they reached their desired stop. Their responses were recorded in Figure 92.

Figure 92 Online survey (Portland): Once at your desired station stop, how would you arrive at your destination?



Note: Respondents were asked to choose all that apply

Where else would you like to see a station?

Survey respondents were asked in addition to stations in Lewiston-Auburn and Portland, where else they would like to see a station. Responses included:

- Augusta
- Bangor
- Bethel
- Cumberland
- Falmouth
- Gray
- Montreal
- Mechanic Falls
- North Yarmouth
- Oxford
- Pineland
- Poland
- Yarmouth

Do you use the Downeaster? For what purposes?

Survey respondents were asked if they use the Downeaster and for what purposes using a dot voting exercise on a poster board. Yes or no answers to the first question were recorded in Figure 74, and the purposes they ride the Downeaster were recorded in Figure 75.

Figure 93 Online Survey (Portland): Do you use the Downeaster?

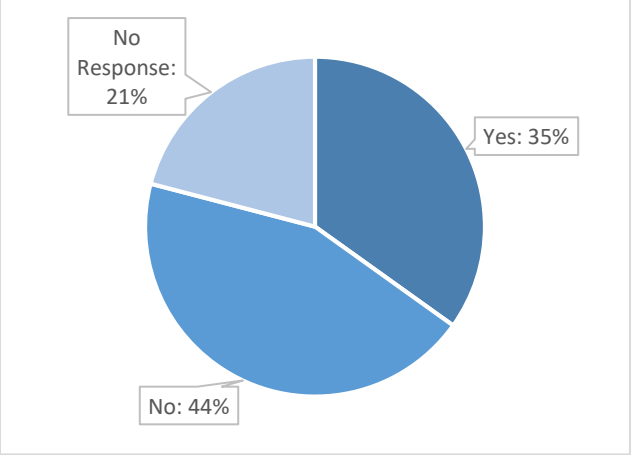
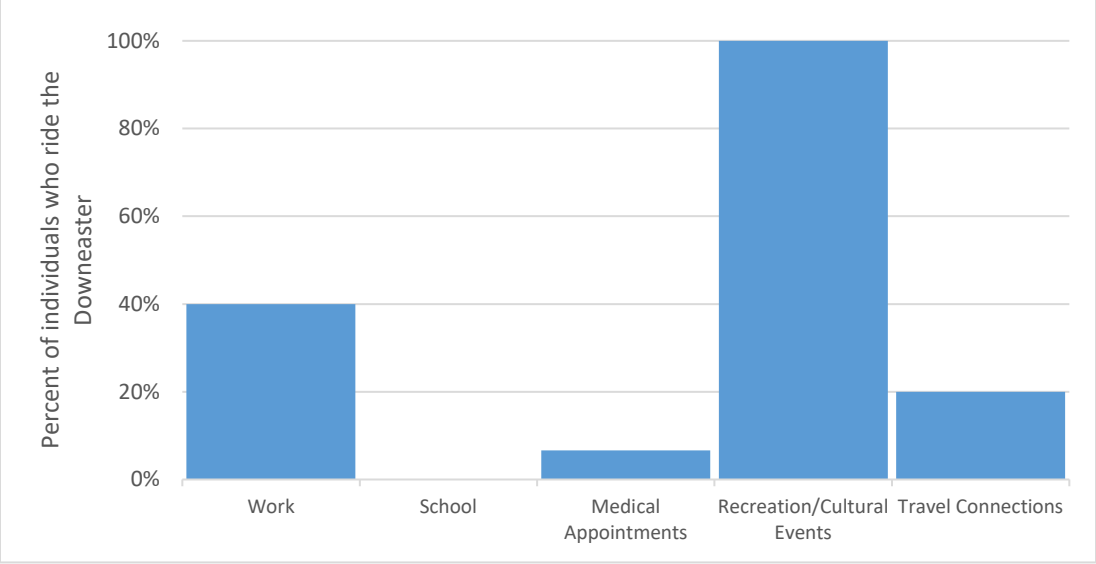


Figure 94 Online Survey (Portland): For what purposes do you use the Downeaster?



Note: Respondents were asked to choose all that apply

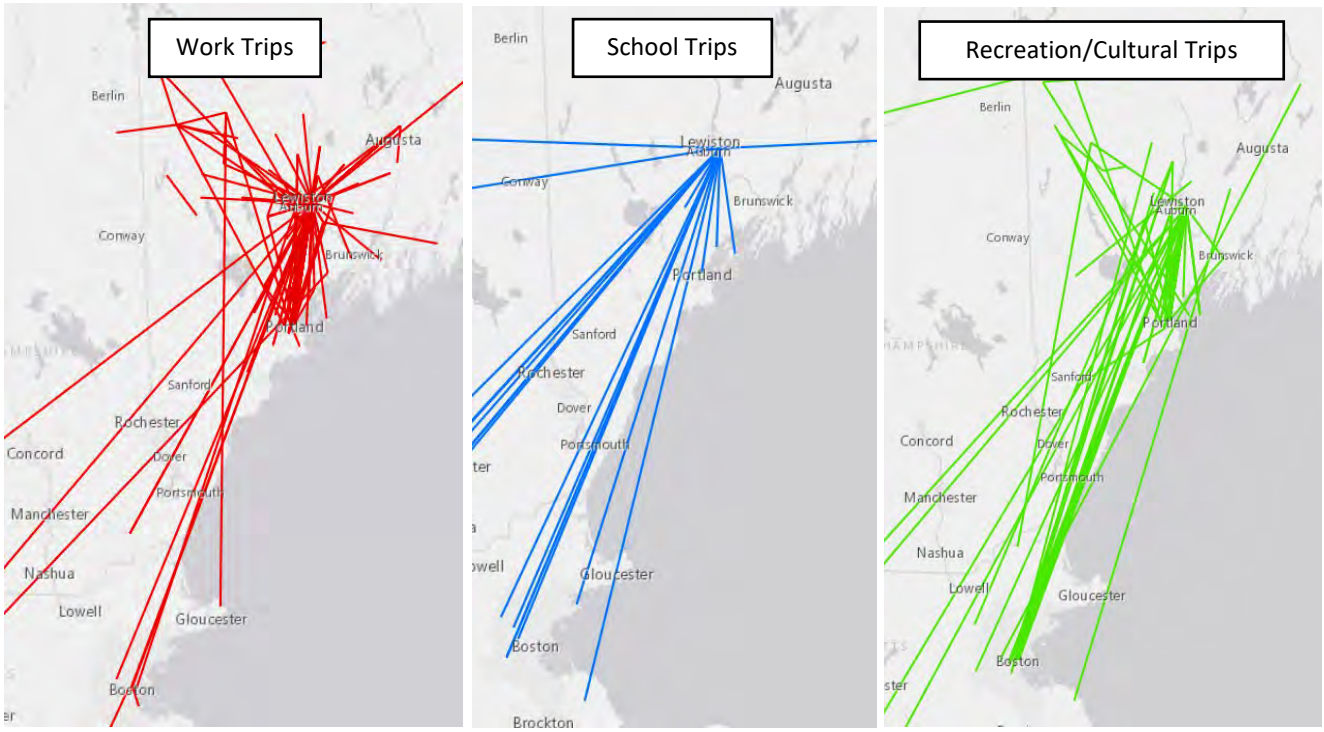
5.4.2 Data/Feedback Received from Northern Study Area Residents

This section details the online survey data received from Northern Study Area residents (except where noted). Results are separated by questions, indicated by the bold text.

Where do you live? What is the most frequent type of trip taken from home? Where is the location of this most frequent trip taken from home?

Survey respondents were asked where they live, the most frequent type of trip taken from home, and the destination of that most frequent trip taken from home. Data from the survey was uploaded into a web application for processing. Figure 88 represents the data collected from both Portland and Northern Study Area residents.

Figure 88 Online Survey: Work, School, and Recreation/Cultural Trips



Note: The maps depicted above include data from Portland and Northern Study Area residents

How frequently do you travel to Portland? For what purposes?

Survey respondents were asked how frequently they travel to Portland and for what purposes. The results are included as Table 45. Recreation/Cultural Events were defined as any type of leisure travel, including trips to festivals, concerts, visiting friends/family, and sporting events. Travel connections were defined as trips taken to connect to another travel mode in Portland (airport, intercity bus, or train).

Table 45 Online Survey (N Study Area): Frequency of Travel to Portland by Trip Type

	Trip Types					
	Work	School	Medical Appointments	Recreation/ Cultural Events	Shopping	Travel Connections
No Response	27.9%	38.8%	21.9%	14.3%	14.1%	15.0%
Seldom (Less than once a month)	35.0%	50.0%	52.9%	14.1%	17.9%	45.5%
Infrequently (1 to 3 times per month)	18.8%	8.0%	22.1%	48.7%	50.7%	34.2%
Often (1 to 2 times per week)	8.9%	1.3%	2.5%	18.1%	12.9%	3.6%
Frequently (3 to 4 times per week)	2.7%	1.1%	0.7%	3.6%	3.8%	1.1%
Very frequently (5+ times per week)	6.7%	0.7%	0.0%	1.3%	0.7%	0.7%
TOTAL	100%	100%	100%	100%	100%	100%

How frequently do you travel to Boston? For what purposes?

Survey respondents were asked how frequently they travel to Boston and for what purposes. The results are included in Table 46. Recreation/Cultural Events were defined as any type of leisure travel, including trips to festivals, concerts, visiting friends/family, and sporting events. Travel connections were defined as trips taken to connect to another travel mode in Boston (airport, intercity bus, or train).

Table 46 Online Survey (N Study Area): Frequency of Travel to Boston by Trip Type

	Trip Types					
	Work	School	Medical Appointments	Recreation/ Cultural Events	Shopping	Travel Connections
No Response	32.6%	37.5%	31.0%	17.6%	21.2%	18.8%
Seldom (Less than once a month)	54.5%	56.3%	63.4%	48.0%	52.9%	56.0%
Infrequently (1 to 3 times per month)	10.9%	5.1%	4.5%	31.0%	23.0%	22.5%
Often (1 to 2 times per week)	1.3%	0.7%	0.9%	2.7%	2.0%	1.8%
Frequently (3 to 4 times per week)	0.4%	0.2%	0.2%	0.4%	0.7%	0.4%
Very frequently (5+ times per week)	0.2%	0.2%	0.0%	0.2%	0.2%	0.4%
TOTAL	100%	100%	100%	100%	100%	100%

If train service were available between Lewiston-Auburn and Portland, would you ride it? For what purposes would you ride it?

Survey respondents were asked if they would ride a train between Lewiston-Auburn and Portland and for what purposes. Yes or no answers to the first question were recorded in Figure 95, and the purposes they would ride it were recorded in Figure 96. Recreation/Cultural Events were defined as any type of leisure travel, including trips to festivals, concerts, visiting friends/family, and sporting events. Travel connections were defined as trips taken to connect to another travel mode in Portland (airport, intercity bus, or train).

Figure 95 Online Survey (N Study Area): If train service were available between Lewiston-Auburn and Portland, would you ride it?

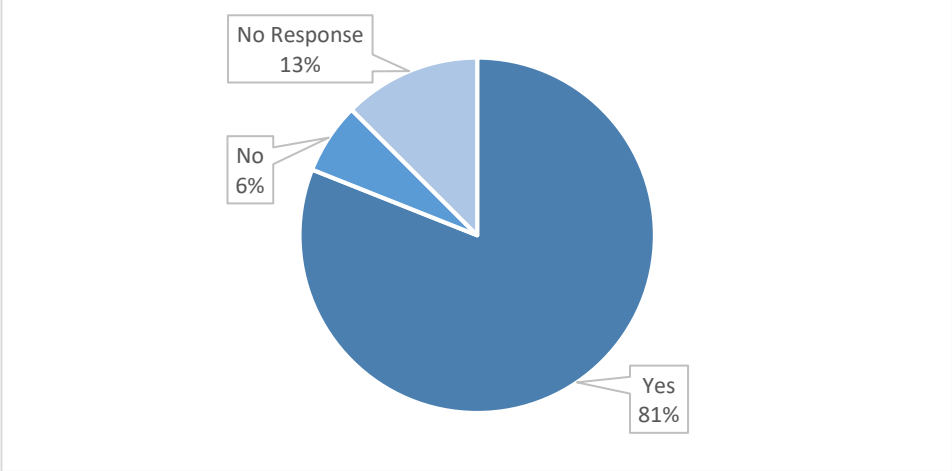
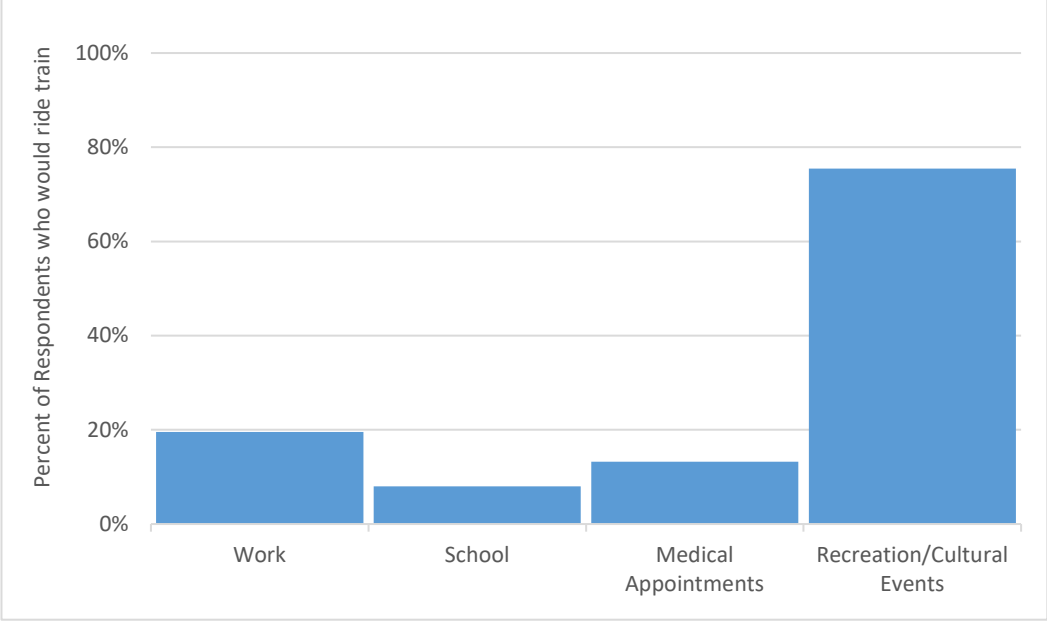


Figure 96 Online Survey (N Study Area): For what purposes would you ride it to Portland?



Note: Respondents were asked to choose all that apply

If train service were available between Lewiston-Auburn and Boston, would you ride it? For what purposes would you ride it?

Survey respondents were asked if they would ride a train between Lewiston-Auburn and Boston and for what purposes. Yes or no answers to the first question were recorded in Figure 97, and the purposes they would ride it were recorded in Figure 98. Recreation/Cultural Events were defined as any type of leisure travel, including trips to festivals, concerts, visiting friends/family, and sporting events. Travel connections were defined as trips taken to connect to another travel mode in Boston (airport, intercity bus, or train).

Figure 97 Online Survey (N Study Area): If train service were available between Lewiston-Auburn and Boston, would you ride it?

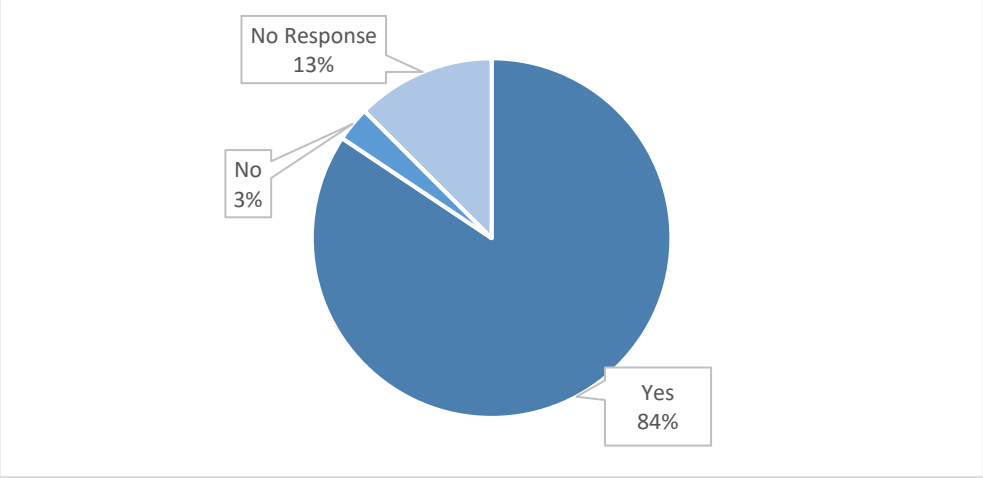
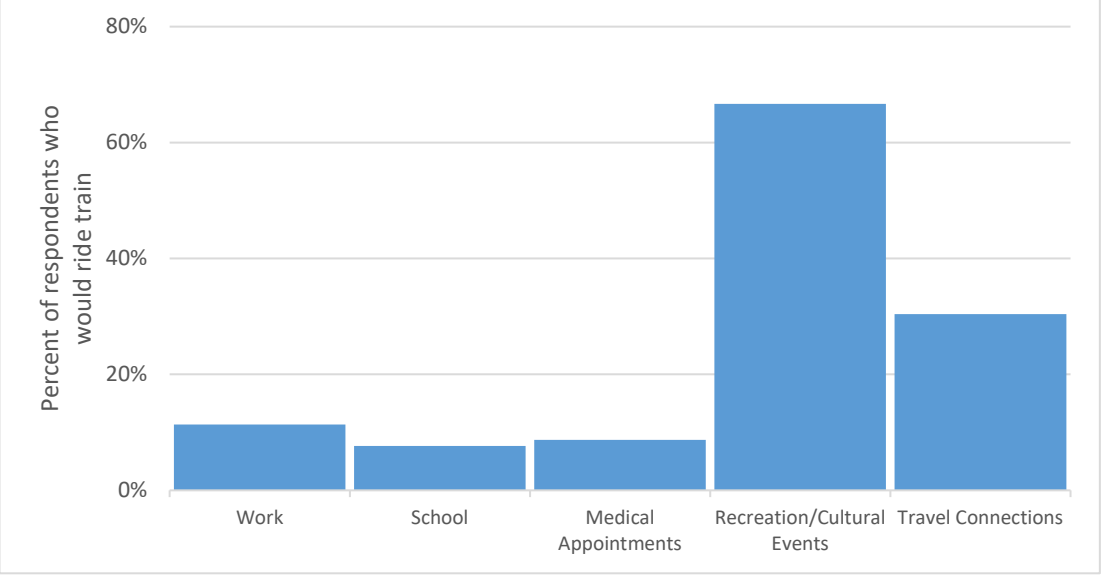


Figure 98 Online Survey (N Study Area): For what purposes would you ride it to Boston?



Note: Respondents were asked to choose all that apply

What is the most you would pay for a one-way train ride? (Between Lewiston-Auburn and Portland, Between Lewiston-Auburn and Boston)

Survey respondents were asked what was the most they were willing to pay for one-way train rides between Lewiston-Auburn and Portland or Boston. Their responses were recorded in Figure 99 and Figure 100, respectively.

Figure 99 Online Survey (N Study Area): What is the most you would pay for a one-way train ride between Lewiston-Auburn and Portland?

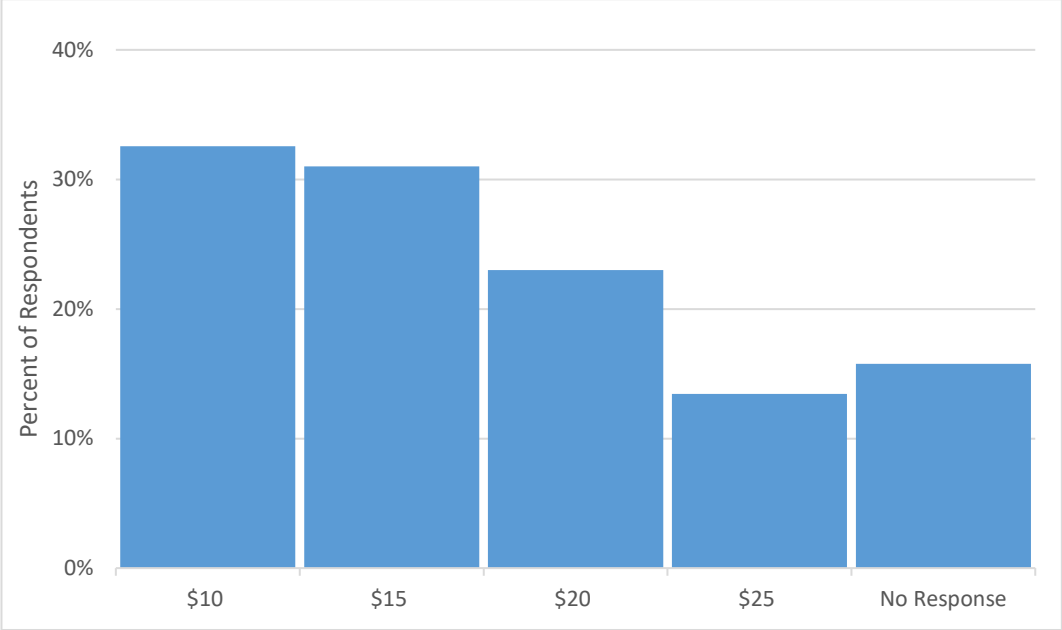
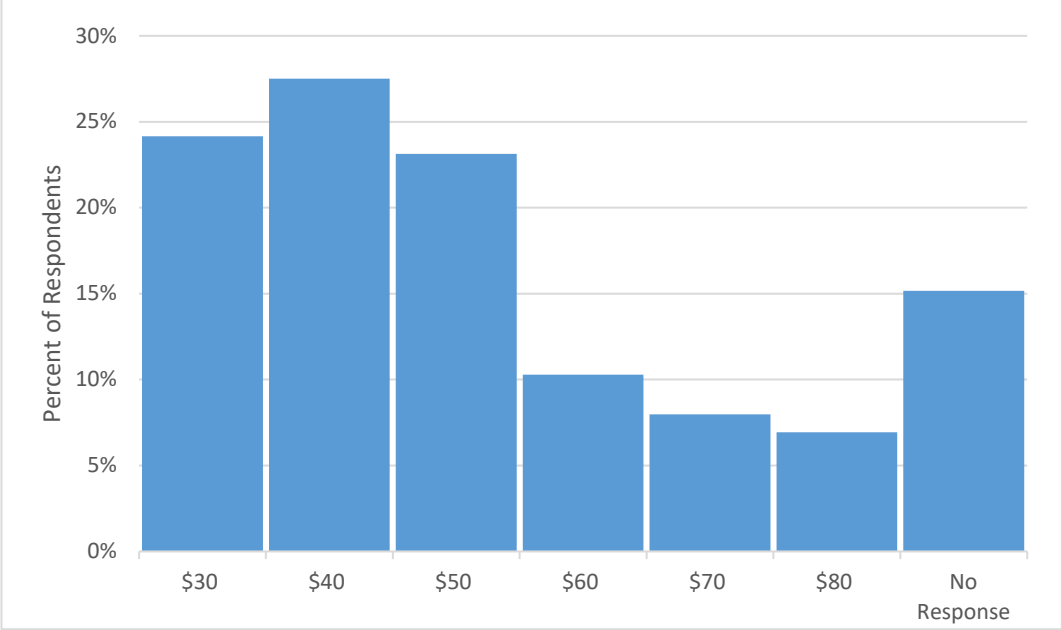


Figure 100 Online Survey (N Study Area): What is the most you would pay for a one-way train ride between Lewiston-Auburn and Boston?



What would make you more likely to use the train?

Survey respondents were asked what would make them more likely to use the train. Their responses are included in Table 47.

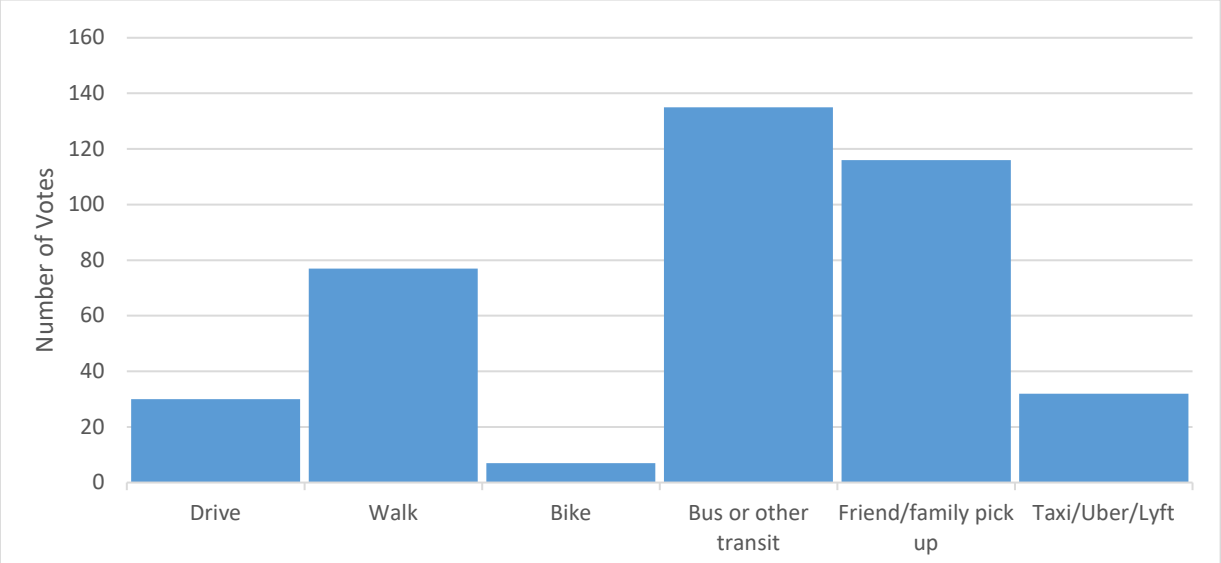
Table 47 Online Survey (N Study Area): Reasons to Ride the Train

	On-board amenities	Proximity to destination	High frequency of service (Many trains per day)	Amenities at station	Lower cost than driving and parking	Travel time competitive to driving	Direct train to Boston
1st (Most important)	6%	14%	26%	3%	25%	10%	20%
2nd	8%	18%	18%	3%	20%	25%	11%
3rd	10%	15%	14%	7%	19%	20%	13%
4th	11%	22%	16%	4%	15%	15%	16%
5th	17%	15%	16%	9%	14%	12%	16%
6th	35%	8%	5%	25%	2%	15%	7%
7th (Least important)	13%	7%	5%	50%	4%	4%	17%
TOTAL	100%	100%	100%	100%	100%	100%	100%

Once at your desired station stop, how would you arrive at your destination?

Survey respondents were asked how they would arrive at their destination after they reached their desired stop. Their responses were recorded in Figure 101.

Figure 101 Online Survey (N Study Area): Once at your desired station stop, how would you arrive at your destination?



Note: Respondents were asked to choose all that apply

Where else would you like to see a station?

Survey respondents were asked in addition to stations in Lewiston-Auburn and Portland, where else they would like to see a station. Responses included:

- Bangor
- Bethel
- Cumberland
- Falmouth
- Freeport
- Gorham
- Gray
- Mechanic Falls
- Montreal
- New Gloucester
- Orono
- Oxford
- Poland
- Portsmouth
- Pineland
- Rockland
- South Paris
- Topsham
- Waterville
- Westbrook
- Windham
- Yarmouth

Do you use the Downeaster? For what purposes?

Survey respondents were asked if they use the Downeaster and for what purposes. Yes or no answers to the first question were recorded in Figure 102, and the purposes they ride the Downeaster were recorded in Figure 103. Recreation/Cultural Events were defined as any type of leisure travel, including trips to festivals, concerts, visiting friends/family, and sporting events. Travel connections were defined as trips taken to connect to another travel mode (airport, intercity bus, or Amtrak Northeast Corridor).

Figure 102 Online Survey (N Study Area): Do you use the Downeaster?

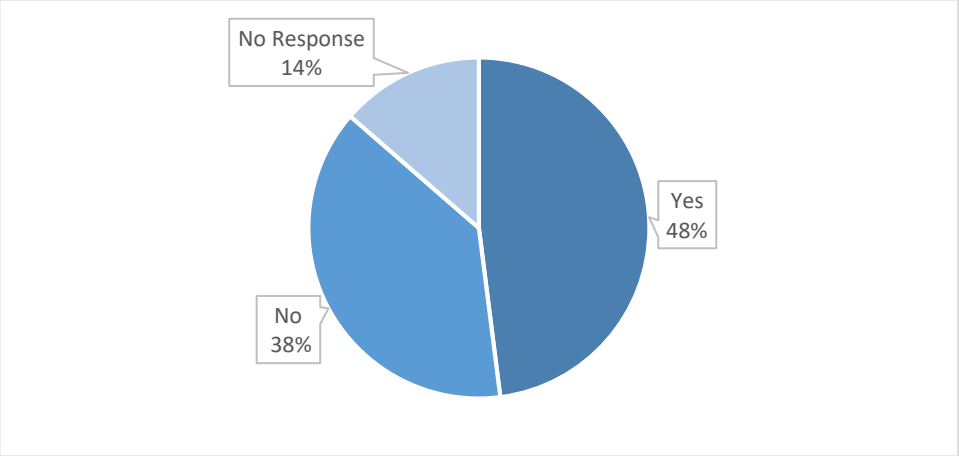
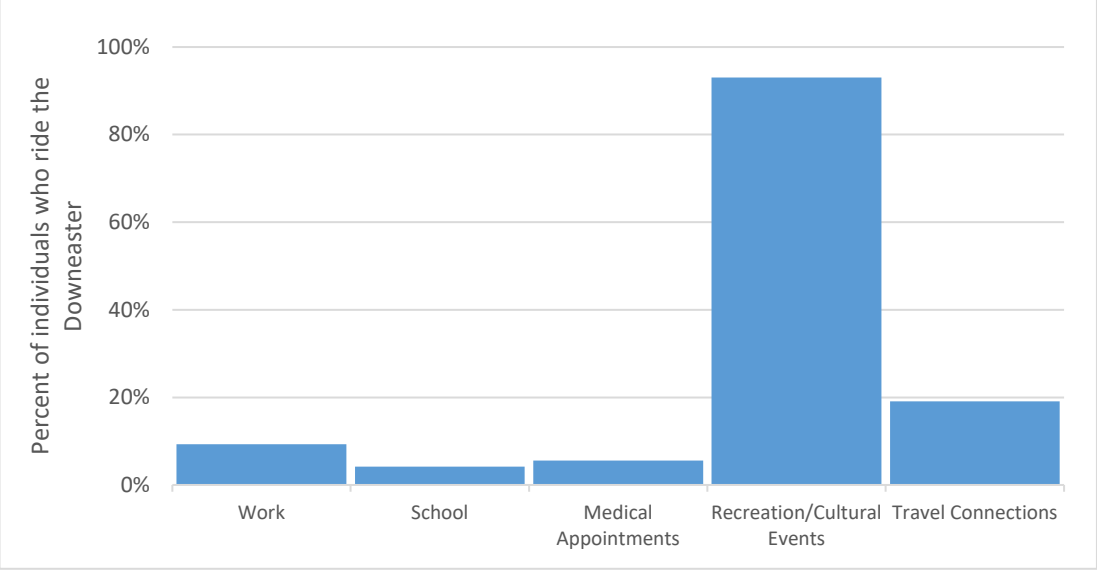


Figure 103 Online Survey (N Study Area): For what purposes do you use the Downeaster?



Note: Respondents were asked to choose all that apply

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6

RIDERSHIP POTENTIAL

6.1 Introduction

The goal of the transit propensity assessment is to establish an understanding of the demand and desire for transit service using available data and public input. This effort establishes an understanding of who travels between the Northern Study Area and the Southern Study Area today; who would potentially use a passenger rail service tomorrow; and who, with the right regional master plan, may consider changing their travel choices.

Portland and Lewiston-Auburn are about 30 miles apart and connected primarily by the Maine Turnpike (I-95). The potential for transit demand in this corridor could be drawn from two markets; first, the diversion of existing trips in the corridor from the highways to the rail service, and second, new trips that would be induced by the service, either that are currently not being made or from increased economic development in the corridor.

Several factors could contribute to incremental future rail ridership associated with a new passenger rail service in the Portland to Lewiston-Auburn corridor:

- Modal shift or diversion of existing (or future baseline) trips to rail from other modes, principally automobile and intercity bus;
- Ridership associated with alternative growth scenarios resulting from more concentrated demographic growth and new development attracted by the presence of a passenger rail service;
- For trips with a regional destination beyond Portland, ridership association with the convenience of a one-seat ride versus the need to transfer at Portland

- Trips that currently are taken locally and mostly by automobile, but are now more attractive to be taken on passenger rail to further destinations, due to reduced impedance (e.g., not needing to drive/park, increased productivity while on the train).

Using the data presented in chapters 2 through 5, propensity of rail passenger demand was prepared for new service between the Northern and Southern Study Areas. The potential range of rail modal shares from the existing rail and transit data in the region has been estimated and compared against corridors considered comparable to Portland and Lewiston-Auburn. A range of rail modal shares to total estimated trips was applied by purpose, in the corridor to derive a range of average daily ridership levels. The results are presented as a range rather than a single ridership estimate, covering a range of assumptions with respect to service frequency and perceived trip time, but also reflecting the variability inherent in high-level planning estimates.

An alternative Growth Scenario was also developed. The Growth Scenario was based on the potential for new economic activity in the corridor. For trips between Lewiston-Auburn and points south of Portland, factors were developed that adjust the rail modal share upward or downward based on the relative convenience, perceived trip time and impedance associated with travel by rail.

The estimate of increased propensity for total travel in the corridor results from estimates of potential new residential and employment development in the corridor, particularly in proximity to rail stations, as well as potential increased trip-making in the rail corridor that better ties together the two distinct urban areas. To the extent that new passenger rail service can better tie these urban areas together and better link their economies, or even to create the perception that the urban areas are closer together and more easily accessible than before, increased trip-making between the urban areas is expected with a share of these incremental trips expected to use passenger rail. Essentially, what currently is a mostly intercity travel market begins to take on the characteristics of an extended urban metropolitan area, in terms of the type and frequency of trips that are made. The potential for this market depends upon the extent to which residents, businesses and institutions in Portland consider Lewiston-Auburn within the orbit of greater Portland, and the extent to which the inverse is true.

The potential for this kind of shift in trip-making needs to be tempered by the distances and by the trip time difference using passenger rail rather than traveling by car, given the relatively good existing highway access. However, time spent on the train can be more productive, less stressful, and less prone to delay than time spent driving.

It is recognized that there is a relatively high level of confidence in the size of the first incremental market – associated with modal shift. The ridership associated with the incremental markets is more speculative. The following results of the passenger rail service analysis between Portland and Lewiston-Auburn summarizes these potential incremental ridership markets and ridership range.

6.2 Methodology

The principal source of data for estimating rail ridership potential was the Maine statewide travel demand database, which includes daily automobile trip and person-trip data for the entire state, for current conditions and a future horizon year of 2040. Daily trips are stratified by four trip purposes: home-based work trips, home-based shopping trips, home-based other trips, and non-home-based trips. The latter three trip purposes were grouped together for reporting purposes as non-work trips.

Travel zones were aggregated within the two Study Areas, surrounding Lewiston-Auburn and Portland. The aggregation was intended to create zones or sub-regions with similar trip-making characteristics, particularly with respect to the propensity of using rail, which is a function of distance from stations. Therefore, sub-regions were created for the areas immediately adjacent to existing and potential stations, along with sub-regions that fall within concentric geographic rings of varying distances from the stations.

Trip tables, for each of the four trip purposes, were created at the level of the aggregated sub-regions, focused on the Northern Study Area. Summary trip tables organized study are trip-making into four geographic travel markets, for each of the trip purposes:

- Trips productions (origins) within the Northern Study Area with attractions (destinations) within the Southern Study Area
- Trips productions (origins) within the Southern Study Area with attractions (destinations) within the Northern Study Area
- Trips productions (origins) within the Northern Study Area with attractions (destinations) along the Downeaster corridor in New Hampshire and Massachusetts, including central Boston
- Trips productions (origins) within the Downeaster corridor catchment areas in New Hampshire and Massachusetts, with attractions (destinations) within the Northern Study Area

These trip tables include person trips by automobile, which is the set of trips that may potentially divert to rail. Separate estimates of rail and transit usage in selected corridors were used to develop data on overall travel volumes by mode. The aggregated state trip tables for 2040 were compared with projected population and employment within each study area sub-region, to provide a basis for estimating trip generation rates for residential and employment development.

Figure 104 illustrates the process that was used to generate ridership estimates for the baseline scenario. A straightforward direct demand estimating tool was developed, enabling rail mode shares to be applied to sub-region total trips to estimate rail ridership. The ridership data were then aggregated into the four geographic markets and two primary trip purposes (work and non-work). Ridership estimates are then presented in terms of daily trips. Demand during peak travel periods (daily and seasonal), and the associated requirements for service and infrastructure to support the peaks, are not explicitly considered in this analysis and are potential subjects for subsequent future study.

Figure 105 and Figure 106 show the additional steps in the process followed to generate estimates for the alternative high-end scenario, with Figure 104 describing the process used to analyze the Lewiston-Auburn-to-Portland markets and Figure 105 showing the adjustments that were made to develop estimates for the travel markets from Lewiston-Auburn extending beyond the Maine state line into New Hampshire and Massachusetts.

Figure 104 Travel Propensity Estimation Methodology – Baseline – All Markets

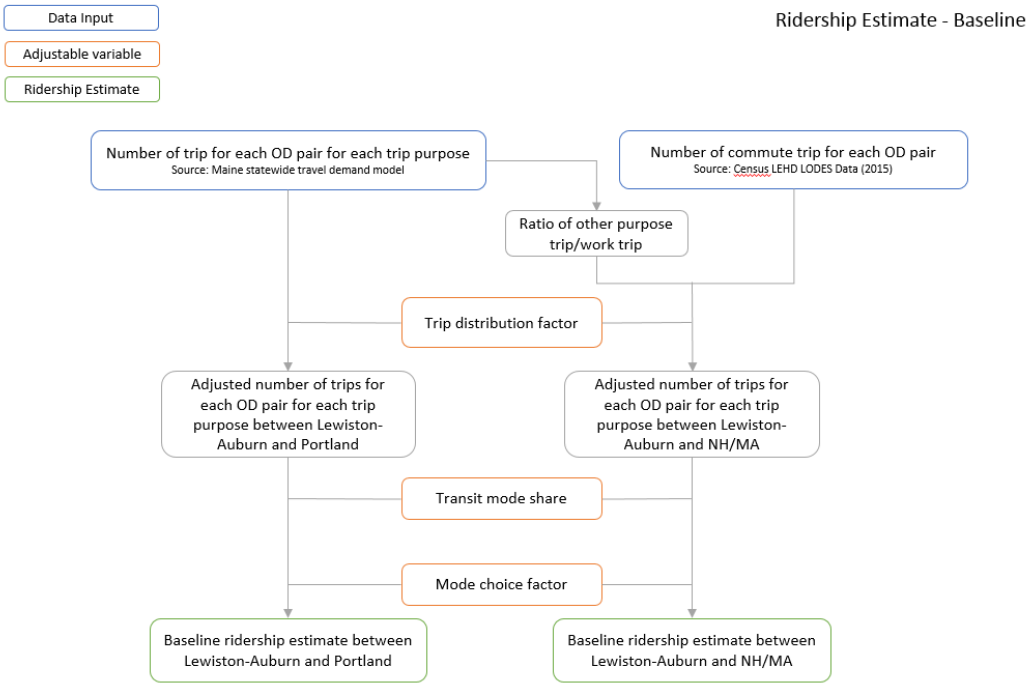


Figure 105 Travel Propensity Estimation Methodology – Growth Scenario Estimate – Market between Lewiston-Auburn and Portland

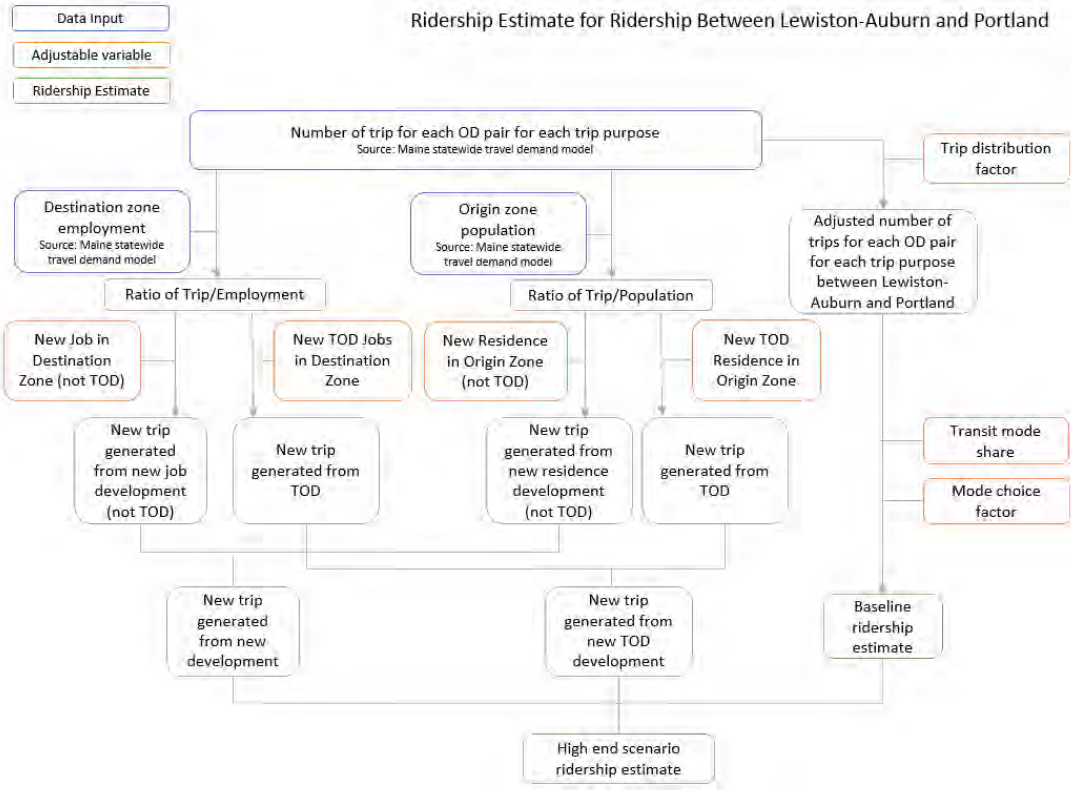
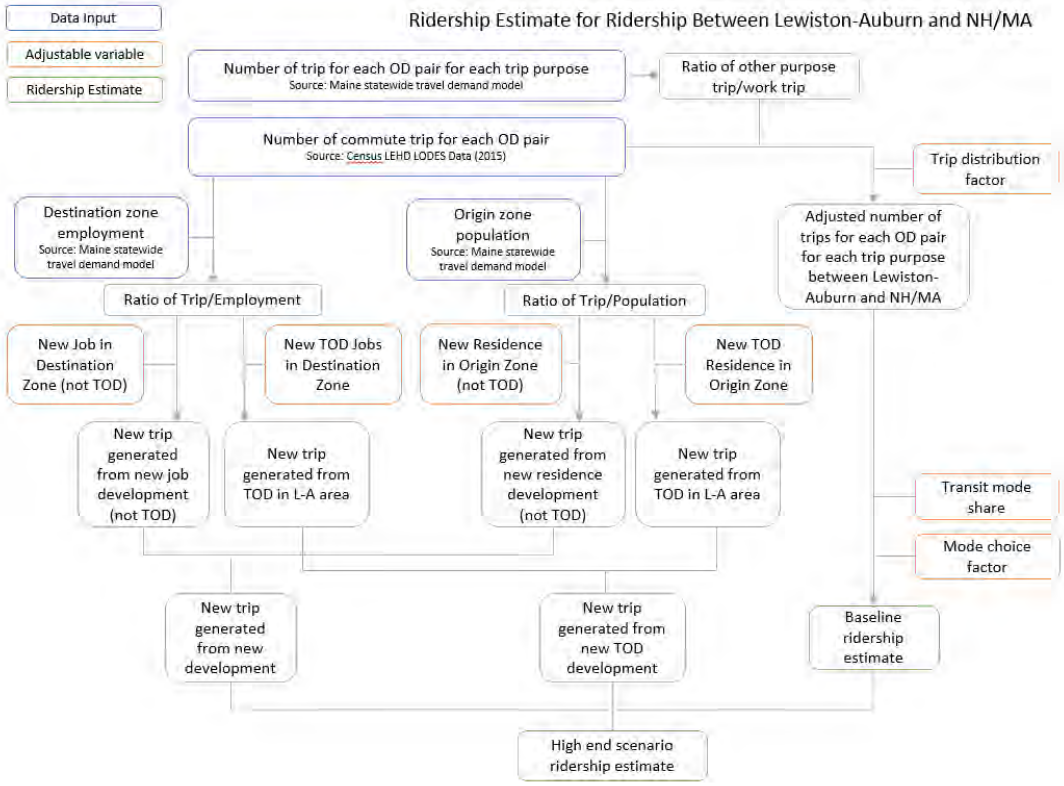


Figure 106 Travel Propensity Estimation Methodology – Growth Scenario Estimate – Market between Lewiston-Auburn and New Hampshire and Massachusetts



The direct demand tool was enhanced to perform additional calculations to support the analysis of an alternative growth scenario that was used to generate estimated ridership. Four processes were added. The first process enables adjusting mode shares upward or downward based on the expected performance of the rail service, including frequency and other variables. Mode shares can be adjusted at the individual sub-region level, or they can be adjusted globally by applying a factor to all sub-regions participating in a particular market, which preserves the relative share potential of sub-regions based on distance and accessibility to rail stations.

The second process enables additional population and employment to be introduced within any of the sub-regions that comprise the Northern Study Area. The number of new residents and workers is translated into daily trips using the trip generation rates calculated from the Maine state data. These trips then are distributed geographically in the same manner as the baseline trips, and mode shares applied to estimate incremental ridership.

The third process introduces the potential for adding population and employment in the sub-regions that correspond to the train stations in Lewiston-Auburn and Portland. This feature is only applicable to the station area sub-regions. The trip distribution and mode choice assumptions can be entered independently for these trips, enabling assumptions that are more responsive to the availability of rail service.

The fourth process permits adjustment to the share of total trips being made between the Northern and Southern Study Areas. It changes the geographic distribution of trips to favor trip-making in the markets along the rail corridor. It applies a factor to the trip table for trips that have one endpoint in the Northern Study Area and the other endpoint either in the Southern Study Area or along the Downeaster corridor in sub-regions attached to Downeaster stations.

Ridership estimates and associated modal shares are reported for each geographic market and trip purpose sub-market.

6.3 Travel Markets

Four geographic travel markets were identified in Chapter 3 for the corridor between Lewiston-Auburn and Portland:

- Northern Study Area to Southern Study Area
- Southern Study Area to Northern Study Area
- Northern Study Area to points south of Portland along the Downeaster service corridor, including the New Hampshire coastal communities and greater Boston
- Points south of Portland along the Downeaster service corridor, including the New Hampshire coastal communities and greater Boston to the Northern Study Area

In addition, these travel markets can be divided into two sub-markets by trip purpose – commute trips to and from places of employment (work trips) and all other trips (non-work trips). Table 48 presents the estimated magnitude of these travel markets in 2040, based on the Maine statewide travel demand data, with the distribution of trips across the Maine state line to specific areas within New Hampshire and Massachusetts synthesized from data obtained from the U.S. Census. Figure 107 shows the relative magnitude of the work trip and non-work trip markets within these geographic travel markets. Figure 108, Figure 109, Figure 110 and Figure 111 show the proportion of total trip-making that occurs with one end in the Northern Study Area and the other end point somewhere along this potential rail corridor. These data also indicate that travel within these markets constitutes a significant but minority share of total trip-making in the region. Not surprisingly, travel within the Northern and Southern Study Areas dominates total travel.

Table 48 Daily Trips by Travel Market

		Daily Trips		
		Work	Non-Work	Total
Lewiston-Auburn	Portland	14,946	24,669	39,615
Portland	Lewiston-Auburn	1,259	7,002	8,261
Lewiston-Auburn	NH and MA	2,239	35,312	37,551
NH and MA	Lewiston-Auburn	712	13,073	13,785
Total		19,155	80,056	99,212

Figure 107 Number of Commute and Non-Work Trips by Market

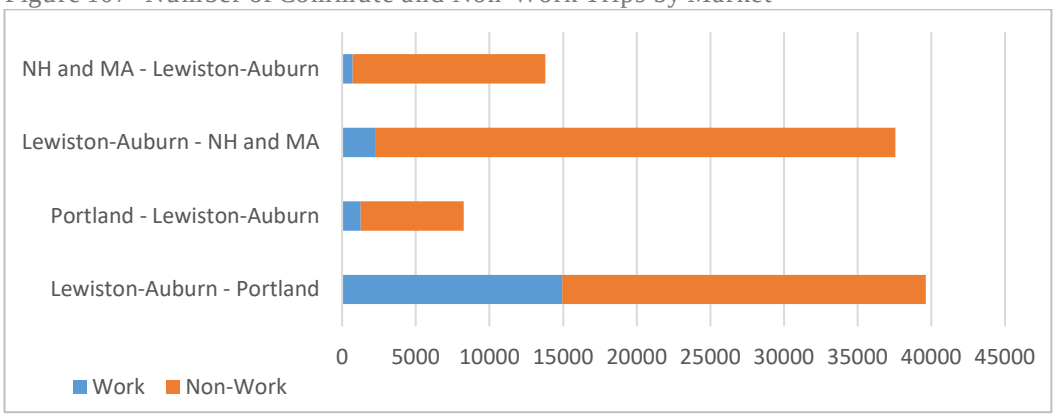


Figure 108 Trips from Lewiston-Auburn

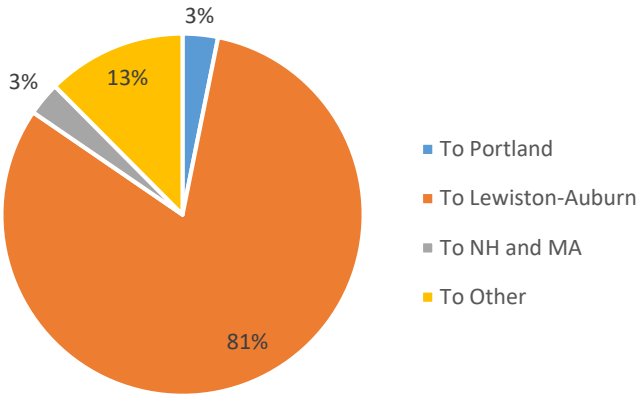


Figure 109 Trips to Lewiston-Auburn

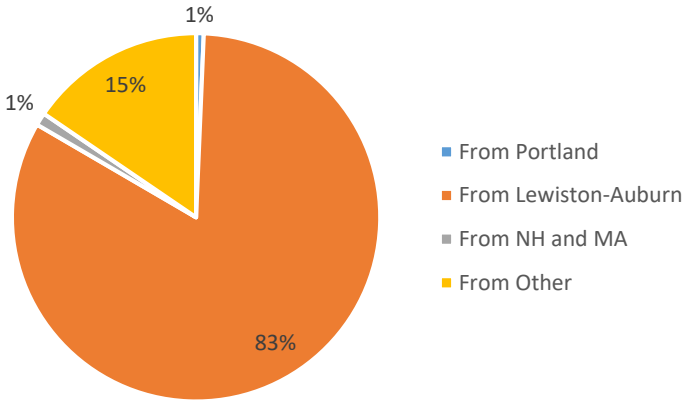


Figure 110 Trips from Portland

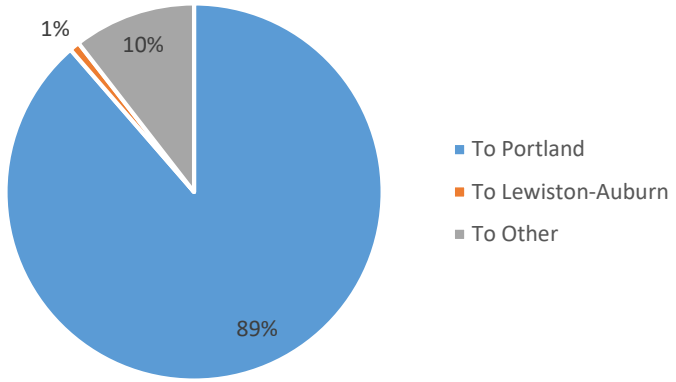
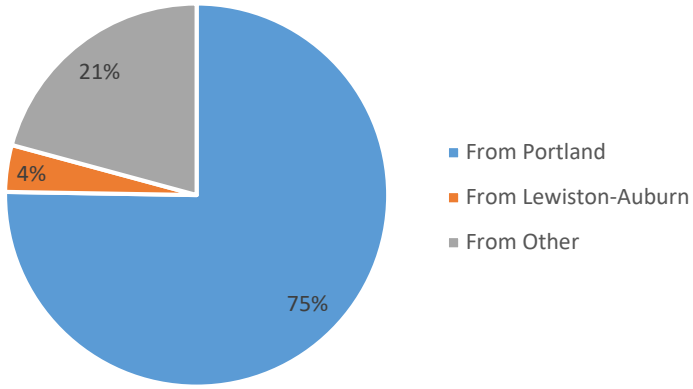


Figure 111 Trips to Portland



6.4 Factors Influencing Propensity to Travel by Rail

There are multiple factors affecting both the size of the travel markets in the corridor and the propensity of travelers to utilize rail. A share of existing automobile trips can be diverted to rail with the provision of a rail service that is time-competitive with auto travel and very convenient to use. Typical characteristics of a convenient and well-performing rail service, which were echoed by the public at the open house events, include:

- Frequent and predictable service
- Reasonable cost of travel (including rail fare and parking/access cost) compared with driving
- Comfortable and accessible rail cars
- Easily accessible stations, including ample available parking, connecting local transit service, convenient bicycle and pedestrian access, and station amenities.

Additional factors that potentially would support and enhance future rail ridership include technological advances such as electronic ticketing and fare payment integrated with other local transit services, readily-available real-time information about train service and availability of wi-fi in stations and on-board trains.

Conversely, a rail service that is infrequent, operates at speeds significantly lower than speed limits on parallel highways, significantly more expensive than driving, or without coordinated transfers or convenient station access would result in lower ridership levels. The 30-mile distance between Lewiston-Auburn and Portland places the corridor in a zone that is relatively long for journey-to-work commuting and short for intercity travel. A rail service for this corridor would need to have the frequency and fare characteristics of a good local transit service, as well as the comfort and convenience of good intercity rail or motor coach service.

The market for trips from the Northern Study Area beyond Portland to Boston and other destinations along the Downeaster corridor will be affected by the type of service and how it operates at Portland. High-performing service with relatively high ridership potential could take one of several forms:

- Through-running service at Portland with reasonably short dwell times
- Coordinated timed-transfers at Portland between a stand-alone Lewiston-Auburn to Portland rail service and existing Downeaster service
- A combination of through service and transfers.

Poor coordination of transfers at Portland, however, will limit the potential of rail to serve longer-distance intercity trips between the Northern Study Area and the Downeaster corridor, including Boston.

Two scenarios were developed to permit a range of future ridership levels to be estimated. Both scenarios begin with the 2040 trip tables, which identify the universe of potential auto trips in the Northern Study Area that potentially could be diverted to rail.

6.4.1 Baseline Scenario

The low end of the range is defined by the baseline scenario, which includes rail modal choice percentages that are relatively conservative but assume the elements of good service described above. Constraints on driving in the corridor are limited, compared to more congested urban corridors. Also, only one station is planned within the Northern Study Area. Rail can be attractive when access distances and times to stations are relatively short, but the rail share of total trip making tends to decline with distance from the station.

6.4.2 Growth Scenario

An alternative scenario was developed to probe the high-end of the potential range of ridership levels, making assumptions about future growth, development and travel behavior that are more optimistic and ambitious in terms of supporting rail travel – but still within the realm of reasonableness.

There are many factors that could contribute to a larger role for rail, which can translate into higher rail mode shares. Improving the availability and convenience of “first mile

and last mile" options to and from train stations has the potential to remove a significant impediment to traveling by rail and boost rail ridership above levels typically experienced on passenger rail systems. Aside from locating a station within close proximity to major origins/destinations, ride-hailing and ride-sharing services can help meet the need for a first mile and last mile connection, though rail shares would still be likely to decline as distances from a rail station increase. However, overall shares can be expected to be higher in areas that can be accessed through relatively seamless first and last mile connection options.

In addition to a higher level of rail modal choice for trips in the Lewiston-Auburn corridor, three other factors are assumed to influence travel behavior and enable higher rail ridership levels in the alternative scenario. These include:

- Increased propensity to travel within the corridor as opposed to elsewhere
- Growth in population and employment within the Northern Study Area beyond the levels projected for 2040 in the State of Maine database
- Additional concentrated transit-oriented development (TOD) activity near the train stations in Lewiston-Auburn and Portland.

The increased propensity to travel in the corridor would result from closer economic ties between the Northern and Southern Study Areas, enabled by the presence of a good rail connection, as well as an increased perception among residents and workers that the two areas work more as a single region than as two distinct and separate urban areas – resulting in an increased affinity between the two places and a higher level of trip-making between them. This effect is estimated by adjusting the geographic distribution of trips originating and ending in the two Study Areas – while keeping the total volume of trip-making constant. The percentage of total trips with one endpoint in the Northern Study Area and the other endpoint in the Southern Study Area would be increased, as would the percentage of total trips between the Northern Study Area and locations in New Hampshire and Massachusetts along the Downeaster corridor. The increases would not dramatically shift the allocation of total trips across the full study area, but a relatively small re-allocation could result in a significant increase in travel activity in the corridor between Lewiston-Auburn and Portland, a portion of which would be carried by rail.

The additional population and employment would be spread within the Northern Study Area sub-regions and would generate trips that would be distributed geographically and allocated among the auto and rail modes in the same way as the baseline trips are analyzed.

The TOD population and employment growth would be concentrated in the immediate vicinity of the two rail stations. This development would tend to attract a disproportionate share of people and employers who would make use of the rail service, resulting in a greater affinity for travel within the corridor served by rail and a greater rail modal share of all trips in the corridor.

Taken together, these factors result in an estimate of potential rail ridership significantly higher than the baseline scenario.

6.5 Rail Service Assumptions

As a basis for estimating the potential extent to which rail can capture trips that otherwise would be made by automobile, the characteristics of a potential rail service in the Lewiston-Auburn corridor were defined. Trip times by rail between Lewiston-Auburn and Portland (and between Lewiston-Auburn and Boston) were not available at this stage of the study. Trip times are assumed in this analysis to be competitive with travel by auto. Two potential types of rail service are contemplated within the corridor:

- Transit-style commuter service, providing reasonably frequent service during weekday morning and evening rush hours and service at regular intervals throughout the day
- Intercity service – extensions of or connections to the Downeaster service at Portland, with a relatively limited number of daily service frequencies

Table 49 summarizes the assumed characteristics of these two types of service and highlights their differences.

Table 49 Rail Service Assumptions for Rail Travel Propensity Analysis

	Transit-Style Service	Intercity-Style Service
Peak Headway	30-45 mins	N/A
Off-Peak Headway	60-120 mins	N/A
Trains by Time Period		
AM Peak	4-5	1
Mid-day	3-6	1
PM Peak	4-5	1
Evening	1-4	1
Total Daily Trains	12-20	4

Both kinds of service are assumed to have good connections to and from the Downeaster Corridor between Portland and Boston, either as a through-running service or with coordinated timed transfer connections.

Access to and egress from the train stations is assumed to be convenient, both by automobile and by alternative means of transportation, including bus transit, bicycling, walking, and ride sharing/ride hailing services.

6.6 Potential 2040 Market Response to Transit-Style Service

The potential level of ridership was estimated for a transit-style rail service (i.e., relatively frequent and regular service) operating between Lewiston-Auburn and Portland, with convenient connections or through-running service to the Downeaster corridor. The 2040 daily trip tables presented in Section 6.3 for the four geographic markets and two trip purpose sub-markets were used as the basis for these estimates. Estimated rail mode choice percentages were applied to the cells in these trip table matrices to arrive at estimated daily ridership. A range of values was generated by analyzing two different scenarios for future growth and travel propensity.

6.6.1 Baseline

The baseline scenario assumes the estimated 2040 size of the travel markets in the corridor remains as estimated in the Maine statewide travel demand database. A key consideration in understanding the travel markets in the Northern Study Area is the share of total trips that fall within the corridor being studied, which is quantified in Table 50. Of the 147,000 daily work trips produced within the Northern Study Area, 11.7 percent have the other end of the trip either within the Southern Study Area or along the Downeaster corridor. This includes almost 15,000 trips to the Southern Study Area and another 2,200 trips to New Hampshire and Massachusetts along the Downeaster Corridor. Of all trips attracted to the Southern Study Area, 8.8 percent are produced within the Northern Study Area. Non-work trips are more dispersed, with 5.4 percent of trips produced by the Northern Study Area falling within the corridor, and 2.6 percent of trips attracted by the Southern Study Area originating in the Northern Study Area. In the opposite direction of travel, the affinity of the two Study Areas is less strong, with slightly more than 1 percent of all trips occurring between the two Study Areas.

Table 50 Share of Total Daily Trips Within the Lewiston-Auburn-Portland Rail Corridor – Baseline Case

	Total Trips	Trips in Corridor			Pct. In Corridor
Work Trips		L A-Portland	L A-NH-MA	Total	
From Lewiston-Auburn	146,917	14,946	2,239	17,185	11.70%
To Lewiston-Auburn	147,629	1,259	712	1,971	1.33%
From Portland	109,443	1,259	N/A	1,259	1.15%
To Portland	169,212	14,946	N/A	14,946	8.83%
Non-Work Trips					
From Lewiston-Auburn	1,107,978	24,669	35,312	59,981	5.41%
To Lewiston-Auburn	1,087,110	7,002	13,073	20,075	1.85%
From Portland	853,522	7,002	N/A	7,002	0.82%
To Portland	964,652	24,669	N/A	24,669	2.56%

The universe of daily trips potentially served by rail includes:

- 14,900 work trips and 24,700 non-work trips from Lewiston-Auburn to Portland
- 1,260 work trips and 7,000 non-work trips from Portland to Lewiston-Auburn
- 2,200 work trips and 35,300 non-work trips from Lewiston-Auburn to sub-regions along the Downeaster corridor in New Hampshire and Massachusetts
- 700 work trips and 13,000 non-work trips from sub-regions along the Downeaster corridor in New Hampshire and Massachusetts to Lewiston-Auburn

Potential rail mode shares were estimated for each of these markets, based on reasonable assumptions drawn from experience on other comparable rail corridors. Mode shares are assumed to be higher for the sub-regions closest to the presumed Lewiston-Auburn station near the central business districts of both cities, and near the existing Portland Transportation Center. Slightly lower mode splits are assumed for sub-regions where convenient transit or first and last mile connections are possible – including downtown Portland, the Portland Airport, and the ring of neighborhoods surrounding Lewiston, Auburn and downtown Portland. Relatively lower mode choice percentages are

assumed for sub-regions that are further away from the stations, reflecting the increasing time, cost and impedance associated with accessing the station from a further distance away.

For the work trip market between Lewiston-Auburn and Portland, rail mode shares range from 12 percent, for the sub-regions immediately adjacent to the train stations, down to 0.5 percent for portions of the Study Areas furthest away from the stations. Non-work mode shares are assumed to be lower, ranging from 6 percent to 0.2 percent. A sample of mode share assumptions at the sub-region to sub-region scale is presented in Table 51.

Table 51 Sample Rail Modal Choice Percentages – Baseline Scenario, Transit-Style Service

Origin (Production) Sub-Region	Destination (Attraction) Sub-Region	Work Trips	Non-Work Trips
Lewiston-Auburn to Portland			
L-A Central Station Area	Portland Station Area	12.0%	6.0%
L-A Central Station Area	Downtown Portland, Airport Area, S. Portland	10.0%	4.0%
L-A Outer Ring	Downtown Portland, Airport Area, S. Portland	6.0%	1.5%
Androscoggin Outer Area	Downtown Portland, Airport Area, S. Portland	2.0%	0.5%
Other Counties in L-A study area	Downtown Portland, Airport Area, S. Portland	0.5%	0.2%
Portland to Lewiston-Auburn			
Portland Station Area	L-A Central Station Area	12.0%	6.0%
Downtown Portland	L-A Central Station Area	10.0%	4.0%
Downtown Portland	Androscoggin Outer Area	2.0%	0.5%
Downtown Portland, Airport Area, S. Portland	Other Counties in L-A Study Area	0.5%	0.2%
Lewiston-Auburn to NH, MA			
L-A Central Station Area	Central Boston	33.0%	10.0%
L-A Central Station Area	Dover-Rochester	8.0%	3.0%
L-A Outer Ring	Central Boston	20.0%	5.0%
L-A Outer Ring	Burlington-Woburn	6.0%	1.0%
Androscoggin Outer Area	Central Boston	5.0%	1.0%
NH, MA to Lewiston-Auburn			
Central Boston	L-A Central Station Area	25.0%	5.0%
Central Boston	L-A Outer Ring	8.0%	3.0%
Central Boston	Androscoggin Outer Area	5.0%	2.0%
Burlington-Woburn	L-A Central Station Area	6.0%	1.0%
Dover-Rochester	L-A Outer Ring	5.0%	2.0%

Aggregating the sub-region to sub-region rail mode choice percentages yields the composite mode choice estimates shown in Table 52.

Table 52 Aggregate Rail Modal Choice Estimates for Baseline Scenario

	Work Trips	Non-Work Trips
Lewiston-Auburn to Portland	1.8%	0.3%
Portland to Lewiston-Auburn	2.1%	0.3%
Lewiston-Auburn to New Hampshire and Massachusetts	2.1%	0.5%
New Hampshire and Massachusetts to Lewiston-Auburn	3.8%	0.7%

The baseline scenario is assumed to generate an estimated 600 daily trips in 2040, diverted from the auto mode. An additional 90 Downeaster passengers are assumed to find boarding the train in Lewiston-Auburn more convenient than at Portland or other existing Downeaster stations. Thus, total daily ridership on the new rail segment between Lewiston-Auburn and Portland is estimated to be approximately 700. The breakdown of estimated ridership by each of the four geographic markets and two trip purposes is shown in Table 53. Work trips from Lewiston-Auburn to Portland primarily in the morning peak and returning in the evening peak, comprise the largest market segment, accounting for about half of total daily ridership. The next largest group of riders are non-work travelers between Lewiston-Auburn and the Downeaster corridor, at just over 130 daily trips.

Table 53 Estimated Rail Ridership – Baseline Scenario, Transit-Style Service

Market	Daily Work Trips	Daily Non-Work Trips	Total
Lewiston-Auburn to Portland	267	57	324
Portland to Lewiston-Auburn	26	21	47
Lewiston-Auburn to NH, MA	47	132	180
NH, MA to Lewiston-Auburn	11	33	43
Total – Diverted from Auto	**350**	**244**	**594**
Downeaster Ridership*			90
TOTAL RIDERSHIP			**684**

*Diverted from existing Downeaster stations.

6.6.2 High End of Range

The high-end scenario makes assumptions more conducive to travel by rail in the corridor. These include higher rail mode shares than the baseline case, a greater propensity for trip-making between the Lewiston-Auburn and Portland Study Areas, higher population and employment growth than in the baseline case, and specific transit-oriented development in proximity to rail stations in Lewiston-Auburn and Portland.

Rail mode choice is assumed to be higher in the alternative scenario, representing the high end of a reasonable range. Baseline mode choice estimates for each pair of sub-regions were multiplied by the factors shown in Table 54 to produce the high end of the range.

Table 54 Mode Choice Factors for Alternative High-End Scenario

Market	Work Trips	Non-Work Trips
Lewiston-Auburn to Portland	2.0	1.5
Portland to Lewiston-Auburn	2.0	1.5
Lewiston-Auburn to NH, MA	1.5	1.5
NH, MA to Lewiston-Auburn	1.5	1.5

A sample of mode share assumptions at the sub-region to sub-region scale is presented in Table 55. For the work trip market between Lewiston-Auburn and Portland, rail mode shares range from 24 percent, for the sub-regions immediately adjacent to the train stations, down to 1 percent for portions of the Northern Study Area furthest away from the stations. Non-work mode shares are assumed to range from 9 percent to 0.3 percent.

Table 55 Sample Rail Modal Choice Percentages – Alternative High-End Scenario, Transit-Style Service

Origin (Production) Sub-Region	Destination (Attraction) Sub-Region	Work Trips	Non-Work Trips
Lewiston-Auburn to Portland			
L-A Central Station Area	Portland Station Area	24.0%	9.0%
L-A Central Station Area	Downtown Portland, Airport Area, S. Portland	20.0%	6.0%
L-A Outer Ring	Downtown Portland, Airport Area, S. Portland	12.0%	2.3%
Androscoggin Outer Area	Downtown Portland, Airport Area, S. Portland	4.0%	0.8%
Other Counties in L-A Study Area	Downtown Portland, Airport Area, S. Portland	1.0%	0.3%
Portland to Lewiston-Auburn			
Portland Station Area	L-A Central Station Area	24.0%	9.0%
Downtown Portland	L-A Central Station Area	20.0%	6.0%
Downtown Portland	Androscoggin Outer Area	4.0%	0.8%
Downtown Portland, Airport Area, S. Portland	Other Counties in L-A Study Area	1.0%	0.3%
Lewiston-Auburn to NH, MA			
L-A Central Station Area	Central Boston	49.5%	15.0%
L-A Central Station Area	Dover-Rochester	12.0%	4.5%
L-A Outer Ring	Central Boston	30.0%	7.5%
L-A Outer Ring	Burlington-Woburn	9.0%	1.5%
Androscoggin Outer Area	Central Boston	4.5%	0.8%
NH, MA to Lewiston-Auburn			
Central Boston	L-A Central Station Area	37.5%	7.5%
Central Boston	L-A Outer Ring	12.0%	4.5%
Central Boston	Androscoggin Outer Area	7.5%	3.0%
Burlington-Woburn	L-A Central Station Area	9.0%	1.5%
Dover-Rochester	L-A Outer Ring	7.5%	3.0%

Table 56 compares the aggregate rail modal choice percentages, by market, for the Baseline and alternative High-End scenarios, based on total trips within each market. The overall percentages remain small, but they represent a significant relative increase over the baseline assumptions.

Table 56 Aggregate Rail Modal Choice Estimates for Baseline and Alternative Scenarios

	Work Trips		Non-Work Trips	
Market	**Baseline**	**High End**	**Baseline**	**High End**
Lewiston-Auburn to Portland	1.8%	3.6%	0.3%	0.4%
Portland to Lewiston-Auburn	2.1%	4.1%	0.3%	0.4%
Lewiston-Auburn to NH, MA	2.1%	3.2%	0.5%	0.7%
NH, MA to Lewiston-Auburn	3.8%	5.7%	0.7%	1.0%

The resulting impact of these increases in rail mode share on potential rail ridership would be on the order of 440 daily passenger trips, and increase of 75 percent above the baseline estimate.

A second factor affecting rail ridership potential in the high-end scenario is the geographic distribution of trips that begin or end within the Northern Study Area. The highest proportion of trips is local, remaining within the same sub-region or zone. A high proportion also travel between sub-regions that are adjacent or located within the same general area (i.e., within the Lewiston-Auburn study area or within the Portland study area). A significant share of trips has one endpoint outside the Northern Study Area altogether. A relatively small share of trips have one endpoint in the Lewiston-Auburn portion of the Study Area and the other endpoint within the Portland portion of the Study Area. For work trips, about 11 percent of trips produced within the Lewiston-Auburn Study Area go to the Portland area. Approximately 9 percent of trips produced in Portland go to Lewiston-Auburn.

The alternative high-end scenario assumes that these percentages increase because of an increased affinity between the two urbanized areas that results in greater levels of trip-making between them. These trips are assumed to be redistributed from other locations rather than generated as new induced trips. This change in travel patterns could be driven by economic factors and location decisions by employers, businesses and residents, and it could be influenced over time by the presence of a good rail service linking the two urbanized areas.

Table 57 presents the factors that were applied to the 2040 volume of total daily trips in the four markets that exist along the rail corridor to reflect an increased propensity to travel along the corridor. Table 58 applies the factors to produce an estimate of total daily trips in the rail corridor.

Table 57 Trip Distribution Factors for Alternative High-End Scenario

Market	Factor
Lewiston-Auburn to Portland	1.75
Portland to Lewiston-Auburn	2.00
Lewiston-Auburn to NH, MA	1.50
NH, MA to Lewiston-Auburn	1.50

Table 58 Share of Total Daily Trips Within the Lewiston-Auburn-Portland Rail Corridor – High-End Scenario

Work Trips	Total Trips	Trips in Corridor			Pct. In Corridor
		L A-Portland	L A-NH-MA	Total	
From Lewiston-Auburn	146,917	26,155	3,359	29,513	20.09%
To Lewiston-Auburn	147,629	2,517	1,068	3,585	2.43%
From Portland	109,443	2,517	N/A	2,517	2.30%
To Portland	169,212	26,155	N/A	26,155	15.46%
Non-Work Trips					
From Lewiston-Auburn	1,107,978	43,171	52,968	59,981	5.41%
To Lewiston-Auburn	1,087,110	14,004	19,609	20,075	1.85%
From Portland	853,522	14,004	N/A	7,002	0.82%
To Portland	964,652	43,171	N/A	24,669	2.56%

Based on these factors, in the Lewiston-Auburn to Portland market, the percentage of all trips originating in the Northern Study Area going to the Southern Study Area is assumed to increase from 10.2 percent to 17.8 percent, and the percentage of trips heading to points in New Hampshire and Massachusetts along the Downeaster corridor is assumed to increase from 2.1 percent to 3.1 percent. In the opposite direction, the percentage of all trips with destinations in Lewiston-Auburn coming from Portland is assumed to increase from 1.1 percent to 2.3 percent. The percentage of trips coming from along the Downeaster corridor in New Hampshire and Massachusetts is assumed to increase from 0.3 percent to 0.4 percent.

Looking at trips originating in the Portland Study area, the percentage of trips going to Lewiston-Auburn is assumed to increase from 8.8 percent to 15.5 percent, and the percentage of trips coming in to destinations in Portland from Lewiston-Auburn would increase from 0.9 percent to 1.8 percent.

The resulting impact on potential rail ridership would be on the order of 640 daily trips, based on the enhanced rail mode splits in the alternative high-end scenario, representing a 61 percent increase in ridership over and above the effects of increased rail mode share.

The third factor influencing ridership potential in the high-end scenario is the magnitude of population and employment growth within the Northern Study Area by 2040. The

high-end scenario assumes growth over and above the levels included in the Maine state travel database. Additional population and employment are spread across the Northern Study Area, with the focus of development within Lewiston, Auburn and Portland, as indicated in Table 59. This growth amounts to 5,200 residents and 5,000 jobs. These are assumptions for planning purposes and not projections based on actual land use and economic development plans. Adjustments should be made in subsequent planning efforts to reflect specific local plans and development opportunities.

Table 59 Additional Study Area Population and Employment Assumed in High End Scenario

Market	Additional Population	Additional Employment
Lewiston and Auburn	2,000	1,100
Northern Study Area – other	400	400
Portland area	2,800	3,500
Total	5,200	5,000

This additional development was assumed to generate trips at rates similar to existing population and employment in the Study Area. The trips are distributed according to the alternative scenario, where there is assumed to be a greater affinity for travel between Lewiston-Auburn and Portland than currently exists. Approximately 15 percent of trips originating from Lewiston-Auburn are assumed to have destinations in the Southern Study Area, for example. This results in a total of 97 additional daily rail trips between the two Study Areas, and 16 daily rail trips between the Northern Study Area and the Downeaster corridor areas of New Hampshire and Massachusetts.

The fourth factor contributing to increased ridership potential in the high-end scenario is the effect of concentrated transit-oriented development (TOD) near the potential new rail station in Lewiston-Auburn and the existing station in Portland. Residents and workers within TOD developments are assumed to be more inclined to utilize the transit service and travel along the corridor(s) served by transit. A placeholder assumption was made about the potential extent of such development at Lewiston-Auburn and Portland. These estimates are not the result of detailed site planning at either location and would need to be updated as more specific plans are made. Table 60presents the level of development assumed in this analysis.

Table 60 Additional Population and Employment Associated with Transit-Oriented Development at Lewiston-Auburn and Portland Stations Assumed in High End Scenario

Market	Additional Population	Additional Employment
Lewiston-Auburn Station Area	500	300
Portland Station Area	500	300
Total	1,000	600

This level of transit-oriented development would generate a total of approximately 45 additional daily rail trips between the two Study Areas, and 9 daily rail trips between the Northern Study Area and the Downeaster corridor areas of New Hampshire and Massachusetts.

The resulting estimated ridership level for the alternative high-end scenario is presented in Table 61, amounting to approximately 1,900 daily trips. The relative contribution to increased ridership of each of the four factors – increased mode share, trip distribution (increased propensity to travel between the two regions comprising the Northern Study Area), additional Study Area population and employment, and TOD at rail stations – is presented in Table 62.

Table 61 Estimated Rail Ridership – Alternative High-End Scenario, Transit-Style Service

Market	Daily Work Trips	Daily Non-Work Trips	Total
Lewiston-Auburn to Portland	1,010	159	1,169
Portland to Lewiston-Auburn	110	37	146
Lewiston-Auburn to NH, MA	111	314	426
NH, MA to Lewiston-Auburn	25	76	101
Total – Diverted from Auto	**1,256**	**586**	**1,842**
Downeaster Ridership*			90
TOTAL RIDERSHIP			**1,932**

*Diverted from existing Downeaster stations.

Table 62 Contribution of Alternative Scenario Assumptions to Incremental Rail Ridership Potential

	Work Trips	Non-Work Trips	Total
Mode Share Adjustment			
Lewiston-Auburn to Portland	293	39	332
Lewiston-Auburn to NH, MA	29	83	111
Total	**322**	**122**	**443**
Trips Distribution Adjustment			
Lewiston-Auburn to Portland	452	18	470
Lewiston-Auburn to NH, MA	43	124	167
Total	**495**	**142**	**637**
Additional Study Area Population and Employment Adjustment			
Lewiston-Auburn to Portland	47	51	97
Lewiston-Auburn to NH, MA	4	12	16
Total	**51**	**62**	**113**
Transit-Oriented Development at Rail Stations			
Lewiston-Auburn to Portland	36	9	45
Lewiston-Auburn to NH, MA	2	7	9
Total	**38**	**17**	**54**

6.7 Potential 2040 Market Response to Intercity-Style Service

The ridership market for intercity-style service is expected to be smaller than for transit-style commuter service, because of more limited service frequency. Based on the 2040 baseline trip table, estimates of the potential rail share of trips in the four geographic markets and two trip purpose sub-markets were estimated with intercity rail service at the level of four daily round trips.

This level of rail service in the corridor is estimated to generate in the range of 240 to 320 daily rail trips, comprising approximately 90 rail trips diverted from existing Downeaster stations (primarily Portland), plus 150-230 new daily rail trips diverted from the automobile mode.

A sample of mode share assumptions at the sub-region to sub-region scale is presented in Table 63. For the work trip market between Lewiston-Auburn and Portland, rail mode shares range from 24 percent for the sub-regions immediately adjacent to the train stations, down to 1 percent for portions of the Study Areas furthest away from the stations. Non-work mode shares are assumed to range from 9 percent to 0.3 percent.

Table 63 Sample Rail Modal Choice Percentages – Baseline Scenario, Intercity-Style Service

Origin (Production) Sub-Region	Destination (Attraction) Sub-Region	Work Trips	Non-Work Trips
Lewiston-Auburn to Portland			
L-A Central Station Area	Portland Station Area	3.0%	1.5%
L-A Central Station Area	Downtown Portland, Airport Area, S. Portland	2.5%	1.0%
L-A Outer Ring	Downtown Portland, Airport Area, S. Portland	1.5%	0.4%
Androscoggin Outer Area	Downtown Portland, Airport Area, S. Portland	0.5%	0.1%
Other Counties in L-A Study Area	Downtown Portland, Airport Area, S. Portland	0.1%	0.1%
Portland to Lewiston-Auburn			
Portland Station Area	L-A Central Station Area	3.0%	1.5%
Downtown Portland	L-A Central Station Area	2.5%	1.0%
Downtown Portland	Androscoggin Outer Area	0.5%	0.1%
Downtown Portland, Airport Area, S. Portland	Other Counties in L-A Study Area	0.1%	0.1%
Lewiston-Auburn to NH, MA			
L-A Central Station Area	Central Boston	8.3%	3.3%
L-A Central Station Area	Dover-Rochester	2.0%	1.0%
L-A Outer Ring	Central Boston	5.0%	1.7%
L-A Outer Ring	Burlington-Woburn	1.5%	0.3%
Androscoggin Outer Area	Central Boston	2.0%	0.3%
NH, MA to Lewiston-Auburn			
Central Boston	L-A Central Station Area	7.5%	1.7%
Central Boston	L-A Outer Ring	2.5%	1.0%
Central Boston	Androscoggin Outer Area	1.5%	0.7%
Burlington-Woburn	L-A Central Station Area	2.0%	0.3%
Dover-Rochester	L-A Outer Ring	1.3%	0.7%

The aggregate rail modal choice for trips in the four geographic markets and two trip purpose sub-markets are shown in Table 64. These are lower than in the baseline case for transit-style service, because the frequency of intercity service is lower. The short-haul markets between Lewiston-Auburn and Portland are expected to be relatively lightly utilized. Rail will not be a convenient option for many work or non-work trips over the 30-mile trip distance. With only one train in each direction during the peak periods, the service would not be well-aligned for most commuters traveling to and from work. Mode shares in the half-percent range are generally consistent with what light-density commuter rail lines achieve in non-central business district markets.

This type of service would perform relatively better for longer-haul intercity markets, which are somewhat less sensitive to service frequency than commuter and urban transit

trips. The performance of the service should approximate the level of market penetration and ridership achieved by the current Downeaster service in the markets it serves directly.

Table 64 Baseline Intercity Service Rail Mode Choice

	Work Trips	Non-Work Trips
Lewiston-Auburn to Portland	0.47%	0.07%
Portland to Lewiston-Auburn	0.52%	0.07%
Lewiston-Auburn to New Hampshire and Massachusetts Market	1.38%	0.36%
New Hampshire and Massachusetts to Lewiston-Auburn Market	0.41%	0.17%

The resulting daily ridership estimates are presented in Table 65 for intercity-style service. The low end of the range represents the baseline scenario with projected 2040 population and employment within the Northern Study Area. The high-end of the range includes trips associated with the additional population and employment growth and TOD development assumed in the alternative growth scenario. Both estimates include the baseline assumptions with respect to rail modal choice and the distribution of trip origins and destinations.

Table 65 Estimated Range of Rail Ridership – Intercity Service Scenario

Baseline Scenario: 2040 Population and Employment

Market	Work Trips	Non-Work Trips	Total
Lewiston-Auburn to Portland	67	14	81
Portland to Lewiston-Auburn	6	5	12
Lewiston-Auburn to NH, MA	13	43	56
NH, MA to Lewiston-Auburn	1	8	10
Total – Diverted from Auto	**87**	**72**	**159**
Downeaster Ridership*			90
TOTAL RIDERSHIP			**249**

Alternative Scenario: With Pop./Empl. Growth and TOD

Market	Work Trips	Non-Work Trips	Total
Lewiston-Auburn to Portland	108	34	142
Portland to Lewiston-Auburn	9	7	15
Lewiston-Auburn to NH, MA	16	54	70
NH, MA to Lewiston-Auburn	2	10	12
Total – Diverted from Auto	**134**	**105**	**239**
Downeaster Ridership*			90
TOTAL RIDERSHIP			**329**

*Diverted from existing Downeaster stations.

6.8 Overall Ridership Estimate

Daily ridership levels on a well-conceived rail line between Lewiston-Auburn and Portland can be expected to fall within the range of estimates presented in Table 66.

These estimates include both Downeaster trips with origins in the Lewiston-Auburn area diverted to a new station in Lewiston-Auburn, as well as new rail trips diverted from the automobile mode.

The range between the low and high estimates is quite wide for transit-style service. This is due to the different assumptions made for the baseline and alternative high-end scenarios.

The range for intercity-style service is narrower, with the only difference between the low and high estimates attributable to the trips associated with higher levels of population, employment and TOD development in the high scenario.

Table 66 Rail Ridership Propensity in Lewiston-Auburn-to-Portland Corridor

	Rail Service	Ridership Range	
	Daily Round Trips	**Daily Rail Trips**	
		Low	High
Transit-Style Service	12-20	700	1900
Intercity-Style Service	4	250	330

6.9 Assessment of Propensity to Travel by Rail in the Study Corridor

The Lewiston-Auburn to Portland corridor is a small market, compared with other corridors in the U.S. with rail service. Even with good connections to Boston via the Downeaster corridor, the total volume of trips potentially served by rail remains relatively modest. With peak headways on the order of 30-45 minutes and off-peak service at 60 to 120 minute intervals, a transit-style service would generate in the range of 700 to 1,000 daily trips, based on a reasonable range of rail modal choice assumptions. This would exceed the daily traffic on regional bus routes but would be below the levels of ridership typically seen on light density commuter rail lines. Daily ridership could approach the level of 2,000 daily trips if the region were to grow more extensively than currently projected, and grow in a way in a way that encourages trip-making between the Lewiston-Auburn and Portland urban areas.

The level of estimated ridership generated by an intercity-style service operating between Lewiston-Auburn and Boston at 4 round trip trains per day is modest, compared with more frequent transit-style service. However, the service would generate new ridership in addition to attracting existing Downeaster riders from the Lewiston-Auburn area to a new, closer station – with two new riders generated for every diverted rider. When considered as the addition of a single station to a rail corridor, total station ridership in the range of 250 to 330 daily boardings and alightings would rank Lewiston-Auburn as the third busiest station on the Downeaster corridor, after Boston North Station and Portland. On the Amtrak system, the station would rank in the top 70 in terms of ridership, from among over 500 locations on the system served by Amtrak trains and connecting buses.

The range of potential ridership is wide because there are many variables that contribute to ridership, and relatively little is known or prescribed about the characteristics of both the travel markets and the service at this early stage of planning. Rather than trying to predict future ridership, this exercise has been intended to identify a reasonable minimum level of ridership that can be expected, while also identifying those conditions that would be necessary to generate a level of ridership that could be considered successful and potentially viable.

In weighing the potential for a successful rail service, it is important to define what constitutes success in terms of ridership, financial performance, and regional benefits. Then, it will be necessary to assess the factors that are necessary to meet the thresholds of successful performance – in terms of their likelihood of occurrence and difficulty to

implement. This should entail an assessment of the realistic potential for transit-oriented development and more general growth in population and employment within the Study Area. It also should consider the potential for future demographic shifts to favor trip-making within and between urbanized areas and via transit versus driving. Another important consideration is the transformative potential of new technologies, with respect to the convenience of the customers' experience using transit (such as comprehensive real-time information and integrated ticketing) and the ease with which passengers can access rail stations (such as more available and less expensive ride-hailing and ride-sharing services for first and last mile access). These factors are variables and unknowns at this moment in time, but they do provide a set of future conditions under which a higher-performing rail service could be operated.

APPENDIX A: HISTORICAL TRAFFIC DATA

Historical Traffic Volumes and Growth Rates for Study Area Roadways

Roadway	Count Station ID	Station Description	Exit	City/Town	2010		2011		2012		2013		2014		2015		2016	
					AADT	% Annual increase from previous count	AADT	% Annual increase from previous count	AADT	% Annual increase from previous count	AADT	% Annual increase from previous count	AADT	% Annual increase from previous count	AADT	% Annual increase from previous count	AADT	% Annual increase from previous count
I-95	81103	I-95 NB ON RAMP FROM ME TPKE APP RD	45	South Portland	5,250	N/A	5,440	4%	5,150	-5%	5,060	-2%	5,250	4%	5,690	8%	6,320	11%
	81102	I-95 SB ON RAMP FROM ME TPKE APP RD	45	South Portland	4,740	N/A	4,780	1%	4,930	3%	5,170	5%	5,250	2%	5,390	3%	5,320	-1%
	81105	I-95(NB) N/O ON RAMP FROM ME TPKE APP RD	45	South Portland	20,890	N/A	21,520	3%	20,970	-3%	20,120	-4%	20,930	4%	22,060	5%	23,230	5%
	81106	I-95 (SB) N/O OFF RAMP TO ME TPKE APP RD	45	South Portland	21,790	N/A	21,870	0%	21,200	-3%	20,750	-2%	21,270	3%	22,340	5%	23,980	7%
	81003	I-95 NB ON RAMP FROM CONGRESS ST/JETPORT	46	Portland	5,190	N/A	4,980	-4%	4,850	-3%	4,800	-1%	4,970	4%	5,230	5%	5,400	3%
	81002	I-95 SB ON RAMP FROM CONGRESS ST/JETPORT	46	Portland	2,540	N/A	2,540	0%	2,630	4%	2,660	1%	2,610	-2%	2,790	7%	2,970	6%
	81005	I-95 (NB) N/O ON RAMP FROM CONGRESS ST	46	Portland	23,130	N/A	23,510	2%	22,850	-3%	21,910	-4%	22,890	4%	23,960	5%	25,070	5%
	81006	I-95 (SB) N/O OFF RAMP TO CONGRESS ST	46	Portland	24,940	N/A	24,770	-1%	24,090	-3%	23,510	-2%	24,110	3%	25,240	5%	26,740	6%
	80905	I-95(NB) N/O ON RAMP FROM SR 25(RAND RD)	47	Portland	21,570	N/A	23,040	7%	21,320	-7%	20,320	-5%	21,140	4%	22,060	4%	23,100	5%
	80906	I-95 (SB) N/O OFF RAMP TO SR 25(RAND RD)	47	Portland	23,010	N/A	22,830	-1%	22,130	-3%	21,960	-1%	22,540	3%	23,470	4%	24,780	6%
	80903	I-95 NB ON RAMP FROM SR 25 (RAND RD)	47	Portland	1,340	N/A	2,640	97%	1,500	-43%	1,460	-3%	1,530	5%	1,610	5%	1,720	7%
	80904	I-95 SB OFF RAMP TO SR 25 (RAND RD)	47	Portland	970	N/A	1,090	12%	1,020	-6%	1,430	40%	1,550	8%	1,550	0%	1,500	-3%
	80902	I-95 SB ON RAMP FROM SR 25 (RAND RD)	47	Portland	2,900	N/A	3,030	4%	2,990	-1%	2,980	0%	3,120	5%	3,320	6%	3,450	4%
	80805	I-95 (NB) N/O ON RAMP FROM LARRABEE RD	48	Portland	18,810	N/A	18,670	-1%	18,370	-2%	17,260	-6%	17,670	2%	18,630	5%	19,720	6%
	80806	I-95 (SB) N/O OFF RAMP TO LARRABEE RD	48	Portland	20,750	N/A	20,430	-2%	19,750	-3%	19,220	-3%	19,450	1%	20,320	4%	21,350	5%
	80803	I-95 NB ON RAMP FROM LARRABEE RD	48	Portland	3,090	N/A	990	-68%	2,510	154%	2,690	7%	2,720	1%	2,840	4%	2,970	5%
	80804	I-95 SB OFF RAMP TO LARRABEE RD	48	Portland	3,710	N/A	3,380	-9%	3,220	-5%	3,160	-2%	3,100	-2%	3,300	6%	3,300	0%
	80802	I-95 SB ON RAMP FROM LARRABEE RD	48	Portland	5,970	N/A	5,780	-3%	5,600	-3%	5,900	5%	6,190	5%	6,450	4%	6,730	4%
	80703	I-95 NB ON RAMP FROM FALMOUTH SPUR	52	Falmouth	760	N/A	790	4%	1,320	67%	1,240	-6%	1,350	9%	1,430	6%	1,530	7%
	80704	I-95 SB OFF RAMP TO FALMOUTH SPUR	52	Falmouth	1,200	N/A	1,220	2%	1,210	-1%	520	-57%	1,050	102%	1,190	13%	1,260	6%
	80605	I-95(NB) N/O ON RAMP FROM SR 26(GRAY RD)	53	Falmouth	13,970	N/A	13,720	-2%	13,390	-2%	12,800	-4%	12,730	-1%	13,490	6%	14,020	4%
	80606	I-95 (SB) N/O OFF RAMP TO SR 26(GRAY RD)	53	Falmouth	14,580	N/A	14,300	-2%	14,020	-2%	13,100	-7%	13,300	2%	13,850	4%	14,400	4%
	80603	I-95 NB ON RAMP FROM SR 26 (GRAY RD)	53	Falmouth	1,780	N/A	1,840	3%	1,690	-8%	1,490	-12%	1,410	-5%	1,490	6%	1,500	1%
	80604	I-95 SB OFF RAMP TO SR 26 (GRAY RD)	53	Falmouth	1,750	N/A	1,800	3%	1,660	-8%	1,520	-8%	1,410	-7%	1,420	1%	1,610	13%
	80505	I-95 (NB) N/O ON RAMP FROM SR 4/26A/115	63	Gray	9,640	N/A	9,500	-1%	9,000	-5%	8,430	-6%	8,550	1%	9,010	5%	9,460	5%
	80506	I-95 (SB) N/O OFF RAMP TO SR 4/26A/115	63	Gray	10,140	N/A	9,890	-2%	9,530	-4%	8,770	-8%	8,940	2%	9,380	5%	9,830	5%
	80501	I-95 NB OFF RAMP TO SR 4/26A/115/US 202	63	Gray	5,830	N/A	5,690	-2%	5,830	2%	5,740	-2%	5,660	-1%	6,090	8%	6,250	3%
	80502	I-95 SB ON RAMP FROM SR 4/26A/115/US 202	63	Gray	5,970	N/A	5,900	-1%	5,990	2%	5,790	-3%	5,940	3%	6,160	4%	6,340	3%
	80405	I-95 (NB) N/O ON RAMP FROM SR4/100/US202	75	Auburn	8,910	N/A	8,770	-2%	8,540	-3%	8,240	-4%	8,030	-3%	8,490	6%	8,920	5%
	80406	I-95 (SB) N/O OFF RAMP TO SR4/100/US 202	75	Auburn	9,330	N/A	9,140	-2%	9,060	-1%	8,470	-7%	8,430	0%	8,770	4%	9,180	5%
	80401	I-95 NB OFF RAMP TO SR 4/100/US 202	75	Auburn	4,320	N/A	4,230	-2%	4,080	-4%	3,860	-5%	4,080	6%	4,230	4%	4,550	8%
	80402	I-95 SB ON RAMP FROM SR 4/100/US 202	75	Auburn	4,630	N/A	4,440	-4%	4,250	-4%	4,000	-6%	4,150	4%	4,330	4%	4,680	8%
	80403	I-95 NB ON RAMP FROM SR 4/100/US 202	75	Auburn	3,580	N/A	3,500	-2%	3,620	3%	3,660	1%	3,560	-3%	3,710	4%	4,010	8%
	80404	I-95 SB OFF RAMP TO SR 4/100/US 202	75	Auburn	3,830	N/A	3,690	-4%	3,780	2%	3,700	-2%	3,640	-2%	3,710	2%	4,030	9%
	80305	I-95 (NB) N/O ON RAMP FROM A PLOURD PKWY	80	Lewiston	6,320	N/A	6,270	-1%	6,030	-4%	5,740	-5%	5,670	-1%	5,840	3%	5,980	2%
	80306	I-95 (SB) N/O OFF RAMP TO A PLOURD PKWY	80	Lewiston	6,320	N/A	6,210	-2%	6,250	1%	5,710	-9%	5,780	1%	5,910	2%	6,280	6%
	80301	I-95 NB OFF RAMP TO ALFRED PLOURDE PKWY	80	Lewiston	4,060	N/A	3,930	-3%	3,920	0%	3,860	-2%	3,770	-2%	4,340	15%	4,330	0%
	80302	I-95 SB ON RAMP FROM ALFRED PLOURDE PKWY	80	Lewiston	4,560	N/A	4,430	-3%	4,320	-2%	4,220	-2%	4,050	-4%	4,430	9%	4,530	2%
	80303	I-95 NB ON RAMP FROM ALFRED PLOURDE PKWY	80	Lewiston	1,470	N/A	1,420	-3%	1,420	0%	1,360	-4%	1,410	4%	1,680	19%	1,390	-17%
	80304	I-95 SB OFF RAMP TO ALFRED PLOURDE PKWY	80	Lewiston	1,540	N/A	1,510	-2%	1,500	-1%	1,460	-3%	1,400	-4%	1,580	13%	1,630	3%
	80205	I-95 (NB) N/O ON RAMP FROM SR 9	86	Sabattus	5,280	N/A	5,310	1%	5,080	-4%	4,650	-8%	4,580	-2%	4,790	5%	4,970	4%
	80206	I-95 (SB) N/O OFF RAMP TO SR 9	86	Sabattus	5,130	N/A	5,120	0%	5,130	0%	4,610	-10%	4,650	1%	4,790	3%	5,000	4%
	80202	I-95 SB ON RAMP FROM SR 9 (MIDDLE RD)	86	Sabattus	1,690	N/A	1,590	-6%	1,630	3%	1,590	-2%	1,630	3%	1,690	4%	1,910	13%
	80201	I-95 NB OFF RAMP FROM SR 9 (MIDDLE RD)	86	Sabattus	1,500	N/A	1,420	-5%	1,450	2%	1,600	10%	1,620	1%	1,610	-1%	1,600	-1%
	80204	I-95 SB OFF RAMP FROM SR 9 (MIDDLE RD)	86	Sabattus	500	N/A	490	-2%	510	4%	490	-4%	500	2%	570	14%	620	9%
	80203	I-95 NB ON RAMP FROM SR 9 (MIDDLE RD)	86	Sabattus	460	N/A	460	0%	490	7%	500	2%	530	6%	570	8%	600	5%
Falmouth Spur	80703	I-95 NB ON RAMP FROM FALMOUTH SPUR	52	Falmouth	760	N/A	790	4%	1,320	67%	1,240	-6%	1,350	9%	1,430	6%	1,530	7%
	80704	I-95 SB OFF RAMP TO FALMOUTH SPUR	52	Falmouth	1,200	N/A	1,220	2%	1,210	-1%	520	-57%	1,050	102%	1,190	13%	1,260	6%
I-295	90703	I-295 (NB) N/O EXIT 3 ON RAMP	3	Portland	37,260	N/A	35,450	-5%	36,120	2%			37,410	2%				
	90704	I-295 (SB) N/O EXIT 3 OFF RAMP	3	Portland	34,890	N/A	33,660	-4%	37,030	10%			38,450	2%				
	90607	I-295 (NB) N/O ON RAMP @ FORE RV BR#6281	N/A	Portland	34,000	N/A	30,900	-9%	31,460	2%			34,280	4%				
	90608	I-295 (SB) N/O OFF RAMP @FORE RV BR#6281	N/A	Portland	30,430	N/A	29,310	-4%	32,410	11%			32,650	0%				
	90109	I-295 (NB) 0.7 MI N/O US 1 OFF RAMP	9 (north of)	Portland	23,460	N/A	22,390	-5%	23,510	5%			24,730	3%			27,010	5%

Historical Traffic Volumes and Growth Rates for Study Area Roadways

Roadway	Count Station ID	Station Description	Exit	City/Town	2010		2011		2012		2013		2014		2015		2016	
					AADT	% Annual increase from previous count	AADT	% Annual increase from previous count	AADT	% Annual increase from previous count	AADT	% Annual increase from previous count	AADT	% Annual increase from previous count	AADT	% Annual increase from previous count	AADT	% Annual increase from previous count
I-295	90110	I-295 (SB) 0.7 MI N/O US 1 ON RAMP	9 (north of)	Portland	23,590	N/A	21,290	-10%	23,650	11%			24,630	2%			25,630	2%
	90003	I-295 (NB) N/O OFF RAMP TO BUCKNAM RD	10	Falmouth	19,820	N/A			19,600	-1%			19,460	0%				
	90004	I-295 (SB) N/O ON RAMP FROM BUCKNAM RD	10	Falmouth					19,880	N/A			20,480	2%				
	54401	I-295 (NB) S/O OFF RAMP TO US 1(EXIT 15)	15	Yarmouth	26,350	N/A			27,920	3%			27,050	-2%				
	54402	I-295 (SB) S/O ON RAMP FROM US1(EXIT 15)	15	Yarmouth	26,750	N/A			28,550	3%			27,280	-2%				
	54403	I-295 (NB) N/O OFF RAMP TO US 1	15	Yarmouth									23,690	N/A				
	54404	I-295 (SB) S/O OFF RAMP TO US 1(EXIT 15)	15	Yarmouth	22,600	N/A			24,490	4%			25,090	1%				
	54301	I-295 (NB) S/O OFF RAMP TO US 1 (N JCT)	17	Yarmouth	22,420	N/A			23,530	2%			25,280	4%				
	54302	I-295 (SB) S/O ON RAMP FROM US 1 (N JCT)	17	Yarmouth	23,450	N/A			25,350	4%			26,370	2%				
	54303	I-295 (NB) N/O OFF RAMP TO US 1 (N JCT)	17	Yarmouth	20,260	N/A			20,810	1%			22,330	4%				
	54304	I-295 (SB) S/O OFF RAMP TO US 1 (N JCT)	17	Yarmouth	21,180	N/A			22,440	3%			23,080	1%				
	54201	I-295 (NB) 0.5 MI S/O DESERT RD OVERPASS	N/A	Freeport	24,490	N/A					24,880	1%	25,520	3%	26,400	3%		
	54202	I-295 (SB) 0.5 MI S/O DESERT RD OVERPASS	N/A	Freeport	25,600	N/A					25,810	0%	26,360	2%	27,250	3%		
	54203	I-295 (NB) N/O OFF RAMP TO DESERT RD	20	Freeport	20,220	N/A			21,030	2%			20,960	0%				
	54204	I-295 (SB) S/O OFF RAMP TO DESERT RD	20	Freeport	20,770	N/A			22,310	4%			22,560	1%				
	54101	I-295 (NB) S/O OFF RAMP TO SR 125/136	22	Freeport	22,870	N/A			23,510	1%			23,660	0%				
	54102	I-295 (SB) S/O ON RAMP FROM SR 125/136	22	Freeport	22,980	N/A			24,500	3%			24,850	1%				
	54103	I-295 (NB) N/O OFF RAMP TO SR 125/136	22	Freeport	19,180	N/A			18,760	-1%			19,870	3%				
	54104	I-295 (SB) S/O OFF RAMP TO SR 125/136	22	Freeport	19,400	N/A			18,840	-1%			20,580	5%				
	54105	I-295 (NB) N/O ON RAMP FROM SR 125/136	22	Freeport	21,000	N/A			22,220	3%			22,510	1%				
	54116	I-295 SB ON RAMP FROM SR 125/136 (EB)	22	Freeport													3,290	N/A
	54113	I-295 NB OFF RAMP TO SR 125/136 (WB)	22	Freeport											2,900	N/A		
	54001	I-295 (NB) N/O OFF RAMP TO US 1	US 1	Freeport	20,720	N/A			20,170	-1%			21,660	4%				
	53901	I-295 (NB) 0.6 MI S/O US 1 OFF RAMP	N/A	Brunswick	22,180	N/A			21,950	-1%			22,470	1%			24,350	4%
	53902	I-295 (SB) 0.6 MI S/O US 1 ON RAMP	N/A	Brunswick	21,510	N/A			22,090	1%			23,900	4%			24,620	2%
	53903	I-295 (NB) N/O OFF RAMP TO US 1	28	Brunswick	13,020	N/A			12,730	-1%			13,550	3%			14,700	4%
	53904	I-295 (SB) S/O OFF RAMP TO US 1	28	Brunswick	13,030	N/A			12,350	-3%			13,180	3%			13,990	3%
SR 136	00601	SR 125/136(DURHAM) N/O SR125/136(MALLET)		Freeport							10,680	N/A					10,450	-1%
	03405	SR 125/136(DURHAM RD) S/O SR125(GRIFFIN)		Freeport							9,660	N/A					9,630	0%
	03401	SR 136(DURHAM RD) N/O SR 125(GRIFFIN RD)		Freeport							5,540	N/A					5,310	-1%
	00505	SR 136 (DURHAM RD) S/O BROWN RD		Freeport							4,200	N/A					4,240	0%
	47805	SR 136 S/O IR 378 (QUAKER MEETING HOUSE)		Durham													3,740	N/A
	10400	SR 136 (RIVERSIDE DR) @ DURHAM TL		Auburn			4,550	N/A			4,500	-1%	4,380	-3%				
	16804	SR 136 (RIVERSIDE DR) SE/O PENLEY CNR RD I		Auburn			4,800	N/A					4,770	0%				
	05207	SR 136 (MILL ST) W/O BROAD ST		Auburn			11,550	N/A					11,340	-1%				
SR 26/100	19001	SR 26/100 (AUBURN ST) N/O SANBORN ST		Portland							14,630	N/A					12,870	-4%
	00805	SR 26/100 (GRAY RD) S/O LEIGHTON RD		Falmouth									12,940	N/A			11,940	-4%
	06601	SR 26/100 (GRAY RD) N/O MARSTON RD		Falmouth													9,970	N/A
	00301	SR 26/100 (GRAY RD) N/O MOUNTAIN RD		Falmouth							8,500	N/A	7,700	-9%			7,550	-1%
	00405	SR 26/100 S/O BLACKSTRAP RD		Cumberland											6,540		6,220	-5%
	00401	SR 26/100 N/O BLACKSTRAP RD		Cumberland							6,710	N/A			6,120	-9%	6,110	0%
	52600	SR 26/100 @ GRAY TL		Cumberland							6,150	N/A					5,750	-2%
	01501	SR 26/100 (PORTLAND RD) N/O HUNT HILL RD		Gray							6,760	N/A					6,340	-2%
SR 26	00218	SR 26(SHAKER) (WB) NW/O SR 4/100/US 202		Gray			4,180	N/A			4,430	3%					4,150	-2%
	00208	SR 26(SHAKER) (EB) NW/O SR 4/100/US 202		Gray			3,710	N/A			4,220	7%					3,930	-2%
	01004	SR 26(SHAKER RD) SE/O SR26A(ME WILDLIFE)		Gray					6,890	N/A	6,780	-2%					6,960	1%
	02908	SR 26 (SHAKER RD) NW/O LIBBY HILL RD		Gray							15,180	N/A					16,210	2%
	02601	SR 26 (SHAKER RD) N/O WEYMOUTH RD		Gray							10,170	N/A					10,460	1%
	37404	SR 26 (MAINE ST) SE/O SR 11		Poland					9,690	N/A			8,670	-5%				
	41404	SR 26(MAIN) SE/O SR 121 @BR# 2921(S JCT)		Oxford									7,550	N/A				
	41408	SR 26/121 (MAIN ST) NW/O SR 121 (S JCT)		Oxford									13,020	N/A				
	41004	SR 26 SE/O IR 629 (OXFORD ST)		Oxford									15,050	N/A				
	01301	SR 26 (PARK ST) N/O PORTER ST @ BR #5924		Paris									7,670	N/A				

Historical Traffic Volumes and Growth Rates for Study Area Roadways

Roadway	Count Station ID	Station Description	Exit	City/Town	2010		2011		2012		2013		2014		2015		2016	
					AADT	% Annual increase from previous count	AADT	% Annual increase from previous count	AADT	% Annual increase from previous count	AADT	% Annual increase from previous count	AADT	% Annual increase from previous count	AADT	% Annual increase from previous count	AADT	% Annual increase from previous count
SR 26	59705	SR 26 S/O IR 460 (ANDREWS RD)		Woodstock									5,590	N/A	5,750	3%	5,840	2%
	00502	SR 26 (WALKERS MILLS RD) NE/O PARKWAY		Bethel									6,500	N/A				
SR 122	38002	SR 122 (SPRING WATER) NE/O SR 26(MAINE)		Poland									4,400	N/A				
	10700	SR 122 (POLAND SPR) @ NEW GLOUCESTER TL		Auburn			4,190	N/A					3,960	-2%				
US 202/SR 4	00202	SR 4/100/US 202 (MAIN ST) NE/O BROWN ST		Gray			12,130	N/A			12,060	0%					11,380	-2%
	02102	SR 4/100(LEWISTON) NE/O MAYALL RD@BR2618		Gray							10,840	N/A					10,140	-2%
	01401	SR 4/100/US 202 N/O GLOUCESTER HILL RD		New Gloucester							8,720	N/A					7,680	-4%
	16702	SR 4/100(WASHINGTON) NE/O MOOSE BROOK RD		Auburn			10,070	N/A					9,380	-2%				
	04401	SR 4/202 (WASHINGTON) (NB) N/O ADAMS ST		Auburn			15,140	N/A					14,480	-1%				
SR 4	09905	SR 4 (CENTER ST) S/O STETSON RD		Auburn					20,660	N/A			19,090	-4%				
	33005	SR 4 (AUBURN) S/O IR 345 (HARLOW HILL)		Turner									11,770	N/A			11,290	-2%
	02201	SR 4/17 (MAIN ST) N/O PINEAU ST		Jay									8,190	N/A			6,620	-10%
US 202/SR 11/SR 17	47000	SR 11/100/US 202 @ LEWISTON TL		Greene			10,850	N/A	10,490	-3%			9,500	-5%				
	33806	SR 11/100/US 202 SW/O SR 106		Leeds			8,380	N/A					7,710	-3%				
	34902	SR 11/100/US 202 NE/O IR 2093 @ TL		Monmouth			8,300	N/A	8,150	-2%			8,370	1%				
	41807	SR 11/100/US 202 W/O SR 135 (W JCT)		Winthrop			13,540	N/A					13,060	-1%				
	03803	SR 11/17/202(WESTERN) E/O PRESCOTT RD		Augusta			21,270	N/A									21,680	0%
SR 125	03402	SR 125(GRIFFIN RD) NE/O SR136(DURHAM RD)		Freeport							4,220	N/A					4,180	0%
	41200	SR 125 (PINKHAM BK RD) @ FREEPORT TL		Durham			2,710	N/A			2,470	-4%					2,520	1%
SR 196	10600	SR 196 (LISBON RD) @ LISBON TL		Lewiston			12,150	N/A	11,830	-3%	11,680	-1%	11,850	1%	11,980	1%	12,080	1%
	09703	SR 196 (LISBON ST) E/O WESTMINSTER ST		Lewiston			16,010	N/A					15,430	-1%				
SR 126	06807	SR 126 (SABATTUS ST) W/O GROVE ST		Lewiston			15,530	N/A					15,270	-1%				
SR 9/126	00106	SR 9/126 (SABATTUS RD) SW/O SR 197		Sabattus									7,920	N/A				
	53902	SR 9/126 NE/O IR1379(OAK HILL ACRES)NJCT		Monmouth									3,120	N/A				
	55503	SR 9/126 E/O IR 2241 (INDIANA) @BR#2165		West Gardiner			4,190	N/A					4,010	-1%				
	03007	SR 9/126 (COBBOSSEE AV) W/O WEST HILL RD		Gardiner			7,770	N/A					7,550	-1%				
US 1	03400	US 1 (MARTIN POINT BR) @ PORTLAND TL		Falmouth							13,030	N/A					12,680	-1%
	02901	US 1 (NB) N/O SR 88 (FORESIDE RD)		Falmouth			6,930	N/A			5,410	-11%					5,380	0%
	02911	US 1 (SB) N/O SR 88 (FORESIDE RD)		Falmouth			5,570	N/A			5,250	-3%					4,980	-2%
	02801	US 1 N/O DEPOT RD		Falmouth			14,390	N/A									11,990	-3%
	02705	US 1 S/O BUCKNAM RD		Falmouth													10,870	N/A
	05201	US 1 N/O SB ON RAMP TO FAL SPUR @BR#5237		Falmouth							9,980	N/A					10,890	3%
	04202	US 1 NE/O JOHNSON RD		Falmouth							7,310	N/A					7,310	0%
	30600	US 1 @ YARMOUTH TL		Cumberland							6,230	N/A					6,740	3%
	01405	US 1 S/O PORTLAND ST		Yarmouth													12,550	N/A
	03906	US 1 (NB) SW/O SR 88 (SPRING ST)		Yarmouth							6,150	N/A	7,040	14%			7,240	1%
	03916	US 1 (SB) SW/O SR 88 (SPRING ST)		Yarmouth							6,470	N/A	6,200	-4%			6,280	1%
	06802	US 1 NE/O VISITOR INFORMATION KIOSK ENT		Yarmouth							8,770	N/A					9,550	3%
	02206	US 1 (LWR MAIN ST) SW/O DESERT RD		Freeport					10,130	N/A	9,970	-2%					10,420	2%
	01306	US 1 (MAIN ST) SW/O JUSTINS WAY		Freeport							11,290	N/A					10,110	-3%
	07900	US 1 @ FREEPORT TL		Brunswick													2,810	N/A
SR 121	19900	SR 11/121 (MINOT AVE) @ MINOT TL		Auburn			11,840	N/A					11,930	0%				
	41403	SR 121(MECHANIC FALLS RD) E/O SR 26(MAIN		Oxford									6,110	N/A				

Source: MaineDOT

APPENDIX B: LIST OF MAJOR EMPLOYERS

Major Employers (100 employees or more) in Northern Study Area

Measured within a 5 mile radius of Lewiston-Auburn downtowns

Company Name	General Address	City	State	Zip Code	Number of Employees
St Marys Hospital	Campus Ave	Lewiston	Maine	04240	2,000
Central Maine Medical Ctr	Main St	Lewiston	Maine	04240	2,566
Td Bank	Chestnut St	Lewiston	Maine	04240	994
Bates College	Andrews Rd	Lewiston	Maine	04240	839
Walmart Distribution Center	Alfred A Plourde Pkwy	Lewiston	Maine	04240	807
Pionite Decorative Surfaces	Pionite Rd	Auburn	Maine	04210	500
Mc Kesson Corp	Mollison Way	Lewiston	Maine	04240	467
Lepage Bakery	Lisbon St	Lewiston	Maine	04240	300
Carbonite	Mollison Way	Lewiston	Maine	04240	253
Geiger Bros	Mount Hope Ave	Lewiston	Maine	04240	243
Hannaford Supermarket	Spring St	Auburn	Maine	04210	240
Maine Department of Human Service	Main St	Lewiston	Maine	04240	230
Elmet Technologies Llc	Lisbon St	Lewiston	Maine	04240	149
Shaw's Supermarket	Center St	Auburn	Maine	04210	200
Hannaford Supermarket	Sabattus St	Lewiston	Maine	04240	186
Advantage Payroll Svc Inc	Merrow Rd	Auburn	Maine	04210	180
Ge Co	Rodman Rd	Auburn	Maine	04210	180
Jc Penney	Center St	Auburn	Maine	04210	170
Sun Journal	Park St	Lewiston	Maine	04240	170
Argo Marketing	Lisbon St	Lewiston	Maine	04240	163
Home Depot	Mount Auburn Ave	Auburn	Maine	04210	160
Kmart	Center St	Auburn	Maine	04210	150
Lowe's Home Improvement	Turner St	Auburn	Maine	04210	150
Montello Manor Inc	College St	Lewiston	Maine	04240	150
Marshwood Center	Roger St	Lewiston	Maine	04240	140
Paychex Inc	Merrow Rd	Auburn	Maine	04210	140
Shaw's Supermarket	East St	Lewiston	Maine	04240	143
Market Square Health Care Ctr	Lisbon St	Lewiston	Maine	04240	130
Maine Community Health Options	Mill St	Lewiston	Maine	04240	125
Bates College Dining	Central Ave	Lewiston	Maine	04240	120
Campus Cuisine	Campus Ave	Lewiston	Maine	04240	120
Marden's Surplus & Salvage	Main St	Lewiston	Maine	04240	113
Edward Little High School	Harris St	Auburn	Maine	04210	110
Deluxe	Lisbon St	Lewiston	Maine	04240	110
Lewiston Public Works	Adams Ave	Lewiston	Maine	04240	110
Russell Park Rehab & Living	Russell St	Lewiston	Maine	04240	110
Sml	Main St	Lewiston	Maine	04240	110
Jones & Vining	Webster St	Lewiston	Maine	04240	100
Lewiston-Auburn College/usm	Westminster St	Lewiston	Maine	04240	100
Northeast Bank	Canal St	Lewiston	Maine	04240	100
Pepsi Beverages Co	Merrow Rd	Auburn	Maine	04210	100
Rowe Truck Ctr	Center St	Auburn	Maine	04210	100

Source: ESRI Business Analyst and City of Lewiston

Major Employers (100 employees or more) in Southern Study Area

Measured within a 5 mile radius of Portland Transportation Center

Company Name	General Address	City	State	Zip Code	Number of Employees
Unum	Congress St	Portland	Maine	04102	3,000
City of Portland	Congress St	Portland	Maine	04101	1,600
Mercy Hospital of Portland	State St	Portland	Maine	04101	1,225
Martinspoint Healthcare	Veranda St	Portland	Maine	04103	800
Wright Express	Gorham Rd	South Portland	Maine	04106	600
Ciee	Fore St	Portland	Maine	04101	501
Spring Harbor Hospital	Andover Rd	Westbrook	Maine	04092	500
Sappi Fine Paper North America	Cumberland St	Westbrook	Maine	04092	491
Southern Maine Community Clg	Fort Rd	South Portland	Maine	04106	400
Td Bank	Portland Sq	Portland	Maine	04101	400
Nichols Portland	Congress St	Portland	Maine	04102	350
Barron Center	Brighton Ave	Portland	Maine	04102	340
Maine College of Art	Congress St	Portland	Maine	04101	300
Portland City Mayor	Congress St	Portland	Maine	04101	300
Keller Williams Realty	Sewall St	Portland	Maine	04102	260
St Joseph's Rehabilation & Res	Washington Ave	Portland	Maine	04103	260
Target	Running Hill Rd	South Portland	Maine	04106	260
Bernstein Shur Sawyer & Nelson	Middle St	Portland	Maine	04101	250
Bill Dodge Auto Group	Saunders Way	Westbrook	Maine	04092	250
Home Depot	Clarks Pond Pkwy	South Portland	Maine	04106	250
Emery-waterhouse Co	Rand Rd	Portland	Maine	04102	240
Aetna	Running Hill Rd	South Portland	Maine	04106	230
Cross Insurance Arena	Civic Center Sq	Portland	Maine	04101	201
Acadia Insurance Co	County Rd	Westbrook	Maine	04092	200
Human Services Dept	Jetport Blvd	Portland	Maine	04102	200
Intermed		Portland	Maine	04101	200
Kohl's	Main St	Westbrook	Maine	04092	200
Oa Physical Therapy Ctr	Sewall St	Portland	Maine	04102	200
On Semiconductor Corp	Western Ave	South Portland	Maine	04106	200
Press Hotel Autograph Collect	Exchange St	Portland	Maine	04101	200
Scarborough Transportation	Pleasant Hill Rd	Scarborough	Maine	04074	200
Seafoodsource.com	Free St	Portland	Maine	04101	200
Seaside Healthcare	Baxter Blvd	Portland	Maine	04103	200
Skilled Care Ctr	Ocean Ave	Portland	Maine	04103	200
Christmas Tree Shops	Payne Rd	Scarborough	Maine	04074	175
Di Millo's Floating Restaurant	Long Wharf	Portland	Maine	04101	175
Springbrook Health Care Ctr	Spring St	Westbrook	Maine	04092	175
National Distributors Inc	Wallace Ave	South Portland	Maine	04106	171
Burnham & Morrill Co	Beanpot Cir	Portland	Maine	04103	170
Deering Lodge Building Corp	Bishop St	Portland	Maine	04103	170
Hannaford Supermarket	Hannaford Dr	Westbrook	Maine	04092	170
Oakhurst Dairy	Forest Ave	Portland	Maine	04101	170
Portland Public Works Dept	Portland St	Portland	Maine	04101	170

Company Name	General Address	City	State	Zip Code	Number of Employees
Seasons Grill	Riverside St	Portland	Maine	04103	170
Shaw's Supermarket	Auburn St	Portland	Maine	04103	170
Kris-way Truck Leasing Inc	Hemco Rd	South Portland	Maine	04106	160
Seventy-five State Street	State St	Portland	Maine	04101	160
Jc Penney	Maine Mall	South Portland	Maine	04106	155
Portland Police Dept	Middle St	Portland	Maine	04101	154
Waynflete School	Spring St	Portland	Maine	04102	154
Diversified Communications	Free St	Portland	Maine	04101	150
Power Pay Llc	Cumberland Ave	Portland	Maine	04101	150
Custom Disability Solutions	Sable Oaks Dr	South Portland	Maine	04106	145
Portland High School	Cumberland Ave	Portland	Maine	04101	145
Deering High School	Stevens Ave	Portland	Maine	04103	140
Lowe's Home Improvement	Brighton Ave	Portland	Maine	04102	140
Vet Centric Inc	Custom House St	Portland	Maine	04101	140
Westin Portland Harborview	High St	Portland	Maine	04101	140
Granite Bay Care Inc	Congress St	Portland	Maine	04102	130
Us Coast Guard	High St	South Portland	Maine	04106	130
Shaw's Supermarket	Congress St	Portland	Maine	04102	128
Wcsh	Congress Sq	Portland	Maine	04101	128
Coca-cola Bottling Co	Western Ave	South Portland	Maine	04106	125
Fireside Inn & Suites Portland	Riverside St	Portland	Maine	04103	125
Portland Public Health Div	Congress St	Portland	Maine	04101	125
South Portland High School	Highland Ave	South Portland	Maine	04106	125
Cumberland Farmers Club	Samuel Rd	Portland	Maine	04103	120
Maine Medical Ctr Research	Research Dr	Scarborough	Maine	04074	120
Stantec Consulting Svc	Payne Rd	Scarborough	Maine	04074	120
Westbrook High School	Stroudwater St	Westbrook	Maine	04092	120
Group Maine Stream	Saunders Way	Westbrook	Maine	04092	116
Brockway-smith Co	Read St	Portland	Maine	04103	115
South Portland Nursing Hm Inc	Anthoine St	South Portland	Maine	04106	114
Bottomline Technologies	Gannett Dr	South Portland	Maine	04106	105
Cracker Barrel Old Country Str	Maine Mall Rd	South Portland	Maine	04106	105
Amec Earth & Environmental	Congress St	Portland	Maine	04101	101
Maine Controls	Presumpscot St	Portland	Maine	04103	101
Wbae	Western Ave	South Portland	Maine	04106	101
American Red Cross Blood Svc	Forest Ave	Portland	Maine	04101	100
Berlin City Honda of Portland	Maine Mall Rd	South Portland	Maine	04106	100
Berlin City Toyota of Portland	Riverside St	Portland	Maine	04103	100
Berry Dunn Mc Neil & Parker	Middle St	Portland	Maine	04101	100
City of Westbrook	Main St	Westbrook	Maine	04092	100
Health Dialog	Monument Sq	Portland	Maine	04101	100
Hope Group	Wallace Ave	South Portland	Maine	04106	100
Hutchins Trucking Co	Dartmouth St	South Portland	Maine	04106	100
Magna Carta Co	Commercial St	Portland	Maine	04101	100
Maine Cardiology Assoc	Gannett Dr	South Portland	Maine	04106	100
Maine Medical Ctr	Research Dr	Scarborough	Maine	04074	100

Company Name	General Address	City	State	Zip Code	Number of Employees
Muskie School	Bedford St	Portland	Maine	04101	100
Nova Seafoods Ltd	Commercial St	Portland	Maine	04101	100
Pt's Show Club	Riverside St	Portland	Maine	04103	100
Riverton Elementary School	Forest Ave	Portland	Maine	04103	100
Shaw's Supermarket	Main St	Westbrook	Maine	04092	100
United Health Group	Po Box 7549	Portland	Maine	04112	100
Via Group	Congress St	Portland	Maine	04101	100
Westbrook City-fire Dept	Main St	Westbrook	Maine	04092	100
Ymca of Southern Me	Forest Ave	Portland	Maine	04101	100
Maine Medical Center	Bramhall St	Portland	Maine	04102	Unknown
University of New England-Portland	Stevens Ave	Portland	Maine	04103	Unknown
University of Southern Maine	Falmouth St	Portland	Maine	04103	Unknown
Portland International Jetport	Westbrook St	Portland	Maine	04102	Unknown

Source: ESRI Business Analyst

APPENDIX C: RAIL MODE SHARE TABLES

APPENDIX C: RAIL MODE SHARE TABLES

Baseline Scenario, Transit-Style Service

Table C-1 Baseline Rail Modal Choice -- Lewiston-Auburn to Portland Market

		Destination Region									
		21	22	23	24	25	26	27	28	29	20
Origin Region		Portland Station	Portland Downtown			Airport	South	Portland	Outer	Outer	Downeaster
Work Trips		Area	West	Center	East	Area	Portland	North	East	North	South
11	L-A Center	12.0%	10.0%	10.0%	10.0%	10.0%	10.0%	6.0%	2.0%	2.0%	6.0%
12	L-A Outer	10.0%	6.0%	6.0%	6.0%	6.0%	6.0%	3.0%	0.0%	0.0%	3.0%
13	Androscoggin Outer	5.0%	2.0%	2.0%	2.0%	2.0%	2.0%	0.5%	0.0%	0.0%	0.5%
14	Other Counties WNE	1.0%	0.5%	0.5%	0.5%	0.5%	0.5%	0.2%	0.0%	0.0%	0.2%
Non-Work Trips											
11	L-A Center	6.0%	4.0%	4.0%	4.0%	4.0%	4.0%	2.0%	0.0%	0.0%	2.0%
12	L-A Outer	4.0%	1.5%	1.5%	1.5%	1.5%	1.5%	0.0%	0.0%	0.0%	1.5%
13	Androscoggin Outer	2.0%	0.5%	0.5%	0.5%	0.5%	0.5%	0.0%	0.0%	0.0%	0.5%
14	Other Counties WNE	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.0%	0.0%	0.0%	0.2%

Table C-2 Baseline Rail Modal Choice -- Portland to Lewiston-Auburn Market

		Destination Region			
		11	12	13	14
Origin Region		Lewiston-Auburn		Androscoggin	Other Counties
Work Trips		Center	Outer	Outer	
21	Portland Station	12.0%	9.0%	4.0%	1.0%
22	Portland Dntn West	10.0%	6.0%	2.0%	0.5%
23	Portland Dntn Center	10.0%	6.0%	2.0%	0.5%
24	Portland Dntn East	10.0%	6.0%	2.0%	0.5%
25	Airport Area	9.0%	6.0%	2.0%	0.5%
26	South Portland	8.0%	5.0%	1.0%	0.5%
27	Portland North	5.0%	3.0%	0.5%	0.2%
28	Outer East	1.0%	0.0%	0.0%	0.0%
29	Outer North	1.0%	0.0%	0.0%	0.0%
20	Downeaster Corr. So.	5.0%	3.0%	2.0%	1.0%
Non-Work Trips					
21	Portland Station	6.0%	4.0%	2.0%	0.5%
22	Portland Dntn West	4.0%	1.5%	0.5%	0.2%
23	Portland Dntn Center	4.0%	1.5%	0.5%	0.2%
24	Portland Dntn East	4.0%	1.5%	0.5%	0.2%
25	Airport Area	4.0%	1.5%	0.5%	0.2%
26	South Portland	4.0%	1.5%	0.5%	0.2%
27	Portland North	2.0%	0.0%	0.0%	0.0%
28	Outer East	0.0%	0.0%	0.0%	0.0%
29	Outer North	0.0%	0.0%	0.0%	0.0%
20	Downeaster Corr. So.	2.0%	1.5%	0.5%	0.2%

Table C-3 Baseline Rail Modal Choice -- Lewiston-Auburn to New Hampshire and Massachusetts Market

		Destination Region								
		21100	21200	21300	21400	22100	31000	32000	33000	99999
Origin Region			New Hampshire				Massachusetts			
Work Trips		Portsmouth	Dover-Rochester	Manchester	Salem	Conway	Boston	Burlington	North 495	Other
11	L-A Center	5.0%	8.0%	2.0%	5.0%	1.0%	33.0%	10.0%	5.0%	0.0%
12	L-A Outer	3.0%	4.0%	1.0%	3.0%	0.0%	20.0%	6.0%	3.0%	0.0%
13	Androscoggin Outer	1.0%	1.0%	0.0%	1.0%	0.0%	5.0%	1.0%	1.0%	0.0%
14	Other Counties WNE	0.5%	0.5%	0.0%	0.5%	0.0%	3.0%	0.5%	0.5%	0.0%
Non-Work Trips										
11	L-A Center	2.0%	3.0%	1.0%	2.0%	0.0%	10.0%	2.0%	1.0%	0.0%
12	L-A Outer	1.0%	1.5%	0.5%	1.0%	0.0%	5.0%	1.0%	0.5%	0.0%
13	Androscoggin Outer	0.4%	0.5%	0.2%	0.4%	0.0%	1.0%	0.4%	0.2%	0.0%
14	Other Counties WNE	0.1%	0.2%	0.1%	0.1%	0.0%	0.5%	0.1%	0.1%	0.0%

Table C-4 Baseline Rail Modal Choice -- New Hampshire and Massachusetts to Lewiston-Auburn Market

		Destination Region			
		11	12	13	14
Origin Region		Lewiston-Auburn		Androscoggin	Other Counties
Work Trips		Center	Outer	Outer	
21100	Portsmouth	6.0%	3.0%	2.0%	1.0%
21200	Dover-Rochester	10.0%	5.0%	3.0%	2.0%
21300	Manchester	2.0%	6.0%	6.0%	6.0%
21400	Nashua-Salem	3.0%	2.0%	1.0%	0.5%
22100	Conway	3.0%	2.0%	1.0%	0.5%
31000	Boston	25.0%	8.0%	5.0%	2.0%
32000	MA Burlington	6.0%	3.0%	2.0%	1.0%
33000	MA north	6.0%	3.0%	2.0%	1.0%
99999	Other MA NH	0.0%	0.0%	0.0%	0.0%
Non-Work Trips					
21100	Portsmouth	1.0%	1.0%	0.5%	0.5%
21200	Dover-Rochester	3.0%	2.0%	1.0%	0.5%
21300	Manchester	1.0%	0.5%	0.0%	0.0%
21400	Nashua-Salem	1.0%	0.5%	0.0%	0.0%
22100	Conway	1.0%	0.5%	0.0%	0.0%
31000	Boston	5.0%	3.0%	2.0%	0.5%
32000	MA Burlington	1.0%	1.0%	0.5%	0.5%
33000	MA north	1.0%	1.0%	0.5%	0.5%
99999	Other MA NH	0.0%	0.0%	0.0%	0.0%

Alternative High-End Scenario, Transit-Style Service

Table C-5 High End Rail Modal Choice -- Lewiston-Auburn to Portland Market

		Destination Region									
		21	22	23	24	25	26	27	28	29	20
Origin Region		Portland Station	Portland Downtown			Airport	South	Portland	Outer	Outer	Downeaster
Work Trips		Area	West	Center	East	Area	Portland	North	East	North	South
11	L-A Center	24.0%	20.0%	20.0%	20.0%	20.0%	20.0%	12.0%	4.0%	4.0%	12.0%
12	L-A Outer	20.0%	12.0%	12.0%	12.0%	12.0%	12.0%	6.0%	0.0%	0.0%	6.0%
13	Androscoggin Outer	10.0%	4.0%	4.0%	4.0%	4.0%	4.0%	1.0%	0.0%	0.0%	1.0%
14	Other Counties WNE	2.0%	1.0%	1.0%	1.0%	1.0%	1.0%	0.4%	0.0%	0.0%	0.4%
Non-Work Trips											
11	L-A Center	9.0%	6.0%	6.0%	6.0%	6.0%	6.0%	3.0%	0.0%	0.0%	3.0%
12	L-A Outer	6.0%	2.3%	2.3%	2.3%	2.3%	2.3%	0.0%	0.0%	0.0%	2.3%
13	Androscoggin Outer	3.0%	0.8%	0.8%	0.8%	0.8%	0.8%	0.0%	0.0%	0.0%	0.8%
14	Other Counties WNE	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.0%	0.0%	0.0%	0.3%

Table C-6 High End Rail Modal Choice -- Portland to Lewiston-Auburn Market

		Destination Region			
		11	12	13	14
Origin Region		Lewiston-Auburn		Androscoggin	Other Counties
Work Trips		Center	Outer	Outer	
21	Portland Station	24.0%	18.0%	8.0%	2.0%
22	Portland Dntn West	20.0%	12.0%	4.0%	1.0%
23	Portland Dntn Center	20.0%	12.0%	4.0%	1.0%
24	Portland Dntn East	20.0%	12.0%	4.0%	1.0%
25	Airport Area	18.0%	12.0%	4.0%	1.0%
26	South Portland	16.0%	10.0%	2.0%	1.0%
27	Portland North	10.0%	6.0%	1.0%	0.4%
28	Outer East	2.0%	0.0%	0.0%	0.0%
29	Outer North	2.0%	0.0%	0.0%	0.0%
20	Downeaster Corr. So.	10.0%	6.0%	4.0%	2.0%
Non-Work Trips					
21	Portland Station	9.0%	6.0%	3.0%	0.8%
22	Portland Dntn West	6.0%	2.3%	0.8%	0.3%
23	Portland Dntn Center	6.0%	2.3%	0.8%	0.3%
24	Portland Dntn East	6.0%	2.3%	0.8%	0.3%
25	Airport Area	6.0%	2.3%	0.8%	0.3%
26	South Portland	6.0%	2.3%	0.8%	0.3%
27	Portland North	3.0%	0.0%	0.0%	0.0%
28	Outer East	0.0%	0.0%	0.0%	0.0%
29	Outer North	0.0%	0.0%	0.0%	0.0%
20	Downeaster Corr. So.	3.0%	2.3%	0.8%	0.3%

Table C-7 High End Rail Modal Choice -- Lewiston-Auburn to New Hampshire and Massachusetts Market

		Destination Region								
		21100	21200	21300	21400	22100	31000	32000	33000	99999
Origin Region			New Hampshire				Massachusetts			
Work Trips		Portsmouth	Dover-Rochester	Manchester	Salem	Conway	Boston	Burlington	North 495	Other
11	L-A Center	7.5%	12.0%	3.0%	7.5%	1.5%	49.5%	15.0%	7.5%	0.0%
12	L-A Outer	4.5%	6.0%	1.5%	4.5%	0.0%	30.0%	9.0%	4.5%	0.0%
13	Androscoggin Outer	1.5%	1.5%	0.0%	1.5%	0.0%	7.5%	1.5%	1.5%	0.0%
14	Other Counties WNE	0.8%	0.8%	0.0%	0.8%	0.0%	4.5%	0.8%	0.8%	0.0%
Non-Work Trips										
11	L-A Center	3.0%	4.5%	1.5%	3.0%	0.0%	15.0%	3.0%	1.5%	0.0%
12	L-A Outer	1.5%	2.3%	0.8%	1.5%	0.0%	7.5%	1.5%	0.8%	0.0%
13	Androscoggin Outer	0.6%	0.8%	0.3%	0.6%	0.0%	1.5%	0.6%	0.3%	0.0%
14	Other Counties WNE	0.2%	0.3%	0.2%	0.2%	0.0%	0.8%	0.2%	0.2%	0.0%

Table C-8 High End Rail Modal Choice -- New Hampshire and Massachusetts to Lewiston-Auburn Market

		Destination Region			
		11	12	13	14
Origin Region		Lewiston-Auburn		Androscoggin	Other Counties
Work Trips		Center	Outer	Outer	
21100	Portsmouth	9.0%	4.5%	3.0%	1.5%
21200	Dover-Rochester	15.0%	7.5%	4.5%	3.0%
21300	Manchester	3.0%	9.0%	9.0%	9.0%
21400	Nashua-Salem	4.5%	3.0%	1.5%	0.8%
22100	Conway	4.5%	3.0%	1.5%	0.8%
31000	Boston	37.5%	12.0%	7.5%	3.0%
32000	MA Burlington	9.0%	4.5%	3.0%	1.5%
33000	MA north	9.0%	4.5%	3.0%	1.5%
99999	Other MA NH	0.0%	0.0%	0.0%	0.0%
Non-Work Trips					
21100	Portsmouth	1.5%	1.5%	0.8%	0.8%
21200	Dover-Rochester	4.5%	3.0%	1.5%	0.8%
21300	Manchester	1.5%	0.8%	0.0%	0.0%
21400	Nashua-Salem	1.5%	0.8%	0.0%	0.0%
22100	Conway	1.5%	0.8%	0.0%	0.0%
31000	Boston	7.5%	4.5%	3.0%	0.8%
32000	MA Burlington	1.5%	1.5%	0.8%	0.8%
33000	MA north	1.5%	1.5%	0.8%	0.8%
99999	Other MA NH	0.0%	0.0%	0.0%	0.0%

Baseline Scenario, Intercity-Style Service

Table C-9 presents the range of rail modal choice percentages for the Lewiston-Auburn to Portland market. Table C-10 presents the assumed mode choice for trips originating in Portland and destined for Lewiston-Auburn. These values are much lower than for the transit-style service scenario, because the frequency of rail service is low and irregular.

Table C-9 Rail Modal Choice for Lewiston-Auburn to Portland Market

		Destination Region									
		21	22	23	24	25	26	27	28	29	20
Origin Region		Portland Station	Portland Downtown			Airport	South	Portland	Outer	Outer	Downeaster
Work Trips		Area	West	Center	East	Area	Portland	North	East	North	South
11	L-A Center	3.0%	2.5%	2.5%	2.5%	2.5%	2.5%	1.5%	0.5%	0.5%	1.5%
12	L-A Outer	2.5%	1.5%	1.5%	1.5%	1.5%	1.5%	0.8%	0.0%	0.0%	0.8%
13	Androscoggin Outer	1.3%	0.5%	0.5%	0.5%	0.5%	3.8%	0.1%	0.0%	0.0%	0.1%
14	Other Counties WNE	0.3%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%	0.1%
Non-Work Trips											
11	L-A Center	9.0%	6.0%	6.0%	6.0%	6.0%	6.0%	3.0%	0.0%	0.0%	3.0%
12	L-A Outer	6.0%	2.3%	2.3%	2.3%	2.3%	2.3%	0.0%	0.0%	0.0%	2.3%
13	Androscoggin Outer	3.0%	0.8%	0.8%	0.8%	0.8%	0.8%	0.0%	0.0%	0.0%	0.8%
14	Other Counties WNE	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.0%	0.0%	0.0%	0.3%

Table C-10 Rail Modal Choice for Portland to Lewiston-Auburn Market

		Destination Region			
		11	12	13	14
Origin Region		Lewiston-Auburn		Androscoggin	Other Counties
Work Trips		Center	Outer	Outer	
21	Portland Station	3.0%	2.3%	1.0%	0.3%
22	Portland Dntn West	2.5%	1.5%	0.5%	0.1%
23	Portland Dntn Center	2.5%	1.5%	0.5%	0.1%
24	Portland Dntn East	2.5%	1.5%	0.5%	0.1%
25	Airport Area	2.3%	1.5%	0.5%	0.1%
26	South Portland	2.0%	1.3%	0.3%	0.1%
27	Portland North	1.3%	0.8%	0.1%	0.1%
28	Outer East	0.3%	0.0%	0.0%	0.0%
29	Outer North	0.3%	0.0%	0.0%	0.0%
20	Downeaster Corr. So.	1.3%	0.8%	0.5%	0.3%
Non-Work Trips					
21	Portland Station	1.5%	0.0%	0.5%	0.1%
22	Portland Dntn West	1.0%	0.4%	0.1%	0.1%
23	Portland Dntn Center	1.0%	0.4%	0.1%	0.1%
24	Portland Dntn East	1.0%	0.4%	0.1%	0.1%
25	Airport Area	1.0%	0.4%	0.1%	0.1%
26	South Portland	1.0%	0.4%	0.1%	0.1%
27	Portland North	0.5%	0.0%	0.0%	0.0%
28	Outer East	0.0%	0.0%	0.0%	0.0%
29	Outer North	0.0%	0.0%	0.0%	0.0%
20	Downeaster Corr. So.	0.5%	0.4%	0.1%	0.1%

Table C-11 Rail Modal Choice for Lewiston-Auburn to New Hampshire and Massachusetts Market

		Destination Region					
		21100	21200	31000	32000	33000	99999
Origin Region		New Hampshire		Massachusetts			
Work Trips		Portsmouth	Dover-Rochester	Boston	Burlington	North 495	Other
11	L-A Center	1.3%	2.0%	8.3%	2.5%	1.3%	0.0%
12	L-A Outer	0.8%	0.0%	5.0%	1.5%	0.8%	0.0%
13	Androscoggin Outer	0.3%	0.3%	2.0%	0.3%	0.3%	0.0%
14	Other Counties WNE	1.0%	0.1%	1.3%	0.1%	0.1%	0.0%
Non-Work Trips							
11	L-A Center	0.7%	1.0%	3.3%	0.7%	0.3%	0.0%
12	L-A Outer	0.3%	0.5%	1.7%	0.3%	0.2%	0.0%
13	Androscoggin Outer	0.1%	0.2%	0.3%	0.1%	0.1%	0.0%
14	Other Counties WNE	0.0%	0.1%	0.3%	0.0%	0.0%	0.0%

Table C-12 Rail Modal Choice for New Hampshire and Massachusetts to Lewiston-Auburn Market

		Destination Region			
		11	12	13	14
Origin Region		Lewiston-Auburn		Androscoggin	Other Counties
Work Trips		Center	Outer	Outer	
21100	Portsmouth	0.5%	0.8%	0.5%	0.3%
21200	Dover-Rochester	2.5%	1.3%	0.8%	0.5%
31000	Boston	7.5%	2.5%	1.5%	0.5%
32000	MA Burlington	2.0%	1.3%	0.8%	0.4%
33000	MA north	2.0%	1.3%	0.8%	0.4%
99999	other MA NH	0.0%	0.0%	0.0%	0.0%
Non-Work Trips					
21100	Portsmouth	0.3%	0.3%	0.2%	0.2%
21200	Dover-Rochester	1.0%	0.7%	0.3%	0.2%
31000	Boston	1.7%	1.0%	0.7%	0.2%
32000	MA Burlington	0.3%	0.3%	0.2%	0.2%
33000	MA north	0.3%	0.3%	0.2%	0.2%
99999	other MA NH	0.0%	0.0%	0.0%	0.0%