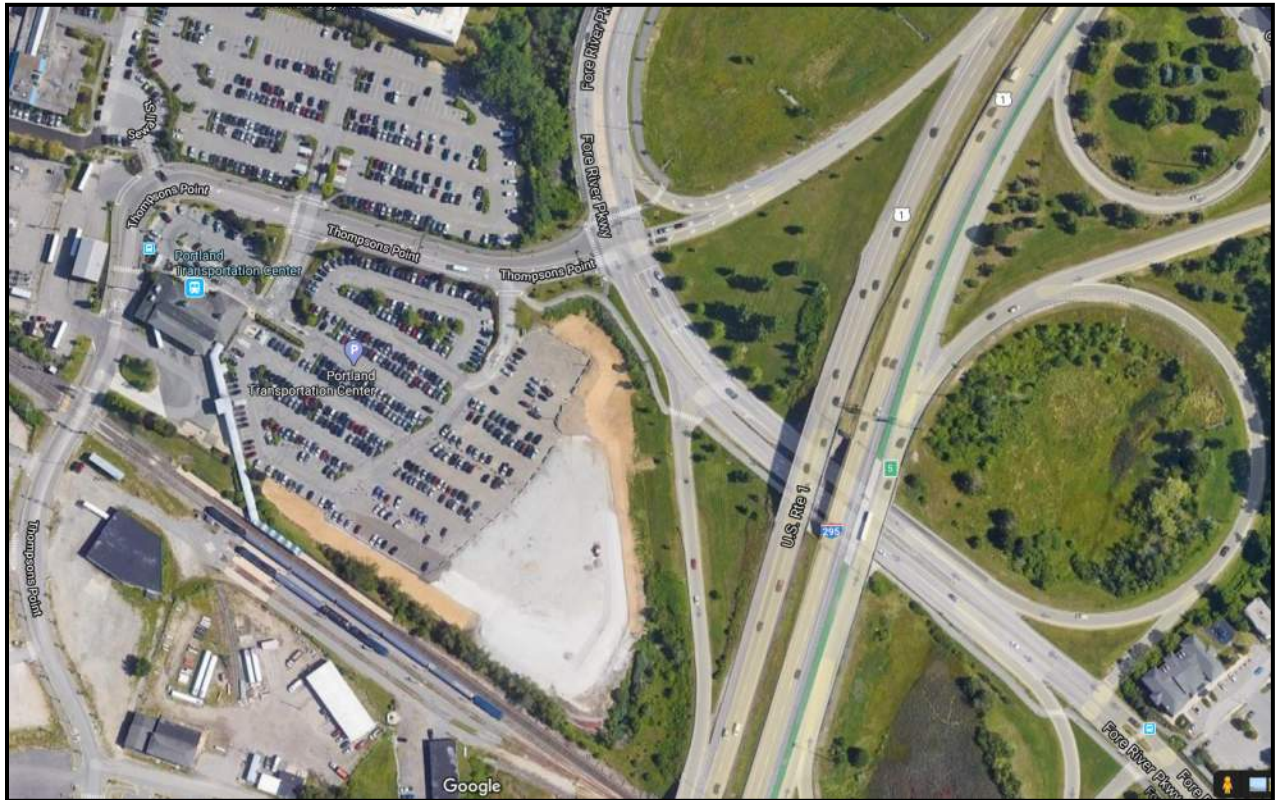


Portland Transportation Center (PTC)

Customer and Transportation System Study



DRAFT December 2020



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Executive Summary

Background

The Portland Transportation Center (PTC) has served as a hub for intercity bus service in the Portland, Maine region since beginning operation at Thompson's Point in 1996. With the addition of rail service in 2001, the PTC is also a transportation terminal for Concord Coach Lines' (CCL) intercity bus service to eastern and northern Maine and points south (particularly express service to Boston and NYC), as well as Amtrak's Downeaster service between Boston and Brunswick, managed by Northern New England Passenger Rail Authority (NNEPRA). The PTC terminal and property, including parking lot is owned and managed by CCL, while the Maine Department of Transportation (MaineDOT) owns an adjacent Park and Ride Lot on the north side of Thompson's Point Road that serves both bus and train customers.

From a transportation perspective, traffic on I-295 through Portland continues to grow, resulting in increasing safety and mobility issues. Growth in local, regional, and intercity/interstate bus and rail service is necessary to balance transportation needs long term and offset the auto dependency of the current location. While bus advocates support the current location due to its easy and immediate access to I-295 and parking availability, rail advocates support the opportunity to relocate to the rail mainline to improve travel times, safety, and maximize opportunity for future expansion. At the same time, the existing PTC facility is in urgent need of a terminal renovation, site improvements, additional parking capacity, and, if NNEPRA remains at the PTC, added train platform capacity. Municipal engagement is also essential to improving integration with transportation and land use in a meaningful and positive way.

Study Process

These challenges, opportunities and needs prompted the MaineDOT to initiate the current PTC Study in 2019. Principal Stakeholders include the City of Portland, CCL, METRO, and NNEPRA; additional stakeholders were engaged to contribute to Study analysis and findings. The Greater Portland Council of Governments (GPCOG) and the Portland Area Comprehensive Transportation System (PACTS) support this study by providing local and regional information and staff resources. While the intent of this Study is to assess future conditions and identify reasonable solutions based on known information, unknown long-term effects of the COVID-19 virus pandemic and its influence on modes of travel introduce uncertainty that may alter key assumptions and findings presented herein.

The PTC Study presents findings in two phases. Phase 1 centered on evaluating efficiency relative to meeting customer needs and realizing transportation benefits at existing and potential new locations as well as understanding the feasibility and potential benefits and costs of relocating bus and/or rail facilities. Phase 1 determined that additional analysis and a reevaluation of key assumptions was required. Phase 2 carried forward the emphasis from Phase 1, in addition

identifying possible new locations for consideration and analysis. The Phase 2 Alternatives Analysis focused on: maintaining CCL operations at the existing PTC location on Thompsons Point; continuing evaluation of potential benefits associated with relocating the rail station on the mainline; re-examining the benefits of the Wye track evaluated in previous NNEPRA and MaineDOT studies and the Phase 1 Alternatives Analysis; and completing a more detailed evaluation of bus and rail parking and operation requirements.

Findings & Recommendations

As part of Phase I of this Study, the Study Team, MaineDOT, and GPCOG developed and conducted Visual and Customer Intercept surveys of existing passengers using the PTC in the summer of 2019. These surveys are helpful to understand how people arrive at the facility – from parking, pick up/drop off, walking, biking, or via local transit – and customer origin, use and travel patterns, and modal flexibility. Survey results show that, although most customers use the PTC on an infrequent basis, they have a strong connection to using both modes of travel, would like to see improved connections to the downtown via transit or shuttle, and are split on whether or not separating the bus and rail stations is important to them. The potential for up to 47% of passengers to use both modes for trips to and from Boston points to a strong synergy for customers to use both bus and rail depending upon their trip purpose, schedule, time of travel, and cost.

Findings on bus and rail synergy speak to an important element of this Study: assessing whether benefits of keeping bus and rail operations in the same station location outweigh benefits that may be achieved by relocating the rail station to a new, more central location. Benefits of colocation can include increased ridership, improved efficiencies that reduce costs, improved coordination with other modes such as local transit, and enhanced economic and funding benefit opportunities. Conversely, with bifurcated stations, the ability for passengers to readily shift between modes will be notably reduced unless a shuttle or other means of transportation is provided between the separate stations. Synergy between modes also has implications for parking demand, with the need for on- or off-site parking at either facility depending on whether services are bifurcated.

Beyond surveys and implications for colocation, the Phase 1 analysis included evaluating four primary alternatives. After initial discussion, several alternatives were expanded to evaluate each based on full- and short-term parking needs, as well as separating bus and rail station locations. The resulting eight alternatives considered current and future mode of access, parking demand, and services using eleven measures of effectiveness (MOEs): safety, mobility, environmental, efficiency, customer accessibility, economic/community development/future vision, parking, costs, funding, mission, and benefit/cost (Table 5-5). Despite developing several iterations of alternatives to accommodate different study objectives, none of the Phase 1 alternatives rose to the level of a recommendation.

Based on outcomes of Phase 1 and discussion with the Principal Stakeholders, MaineDOT opted to continue with a second phase of analysis. The Phase 2 Study evaluated four alternatives in

addition to those already considered. While the Phase 1 focus on customer efficiency, modal connections, and mobility was carried forward into Phase 2, the following issues were foremost: maintaining CCL operations at the existing PTC location on Thompsons Point; continuing evaluation of potential benefits associated with relocating NNEPRA to a separate rail station on the mainline and resulting improvements in transportation and rail safety; re-evaluating the benefits of the Wye track; and completing a more detailed evaluation of bus and rail parking and operation requirements. MOEs were simplified in Phase 2 of the Study to include safety, mobility, operations, environmental, modal connectivity, ease of implementation, and costs (Table 6-5).

The quantitative and qualitative analysis of the Phase 2 Alternatives and supporting information from the Phase 1 findings result in a recommendation for further evaluation of Alternative 8, which envisions retaining the existing PTC location on Thompson's Point for bus operations and developing the Union Station area adjacent to Congress Street for rail operations. Using the MOEs, this alternative can provide the highest transportation benefit coupled with the highest customer benefits of all alternatives evaluated. The value of transportation benefit should be considered above all other benefit opportunities. While the benefit-to-cost ratio for Alternative 8 is less than 1.0, further evaluation could identify additional transportation, economic, and land use benefits that could help offset identified costs for this alternative. The Study Team further recommends MaineDOT pursue both short-term and long-term actions. Short-term actions would begin immediately and ideally conclude within the next two years. The timing of long-term actions could be dependent on opportunities and required level of investment, beginning prior to the conclusion of some or all short-term actions and concluding within the next five years.

Short-term Actions:

1. Create a short-term investment, operation and maintenance PTC plan that focuses on enhancing both bus and rail ridership and maximizing benefit to both the customer and transportation system.
2. Conduct a more detailed evaluation of Alternative 8 to provide a greater level of information to support advancing this alternative, including an analysis of creating connectivity between the bus and rail stations. This effort should encourage participation from relevant Principal Stakeholders and other stakeholders.
3. Incorporate short- and long-term actions into local/state/agency master plans.

Long-term Actions:

1. Identify sources and secure funding to implement Alternative 8 if more detailed evaluation shows benefits outweigh costs.
2. If further study shows positive benefit-cost comparison, implement Alternative 8 under a set of conditions that address landowner willingness, NNEPRA and City of Portland support, consistency with the area's current master plan, options for creating connectivity between separate modal facilities, and securing funding.
3. Identify a public entity to own and/or operate the PTC and new rail station(s), similar to many public transportation centers, thereby allowing opportunity for all modes and carriers to be equally managed and invested.

1. Introduction

1.1 Preface – COVID-19 Pandemic

The Portland Transportation Center (PTC) Customer and Transportation System Study (Study) began in June 2019, prior to the COVID-19 pandemic which began to significantly impact the nation in March 2020. During the pandemic, bus and rail passenger ridership at the PTC and throughout the rest of the nation have been dramatically altered. The intent of this Study is to assess future conditions and identify reasonable solutions based on information known prior to the pandemic. However, the long-term effects of the COVID-19 virus are unknown at this time and may alter key assumptions and findings presented in this Study.

1.2 Background

The Portland Transportation Center (PTC) serves as a transportation terminal in Portland Maine for Concord Coach Lines' (CCL) intercity bus service to eastern and northern Maine and points south (particularly express service to Boston and NYC), as well as Amtrak's Downeaster service between Boston and Brunswick, managed by Northern New England Passenger Rail Authority (NNEPRA). The PTC terminal and property, including parking lot, is located on the south side of Thompson's Point Road and is owned and managed by CCL. The Maine Department of Transportation (MaineDOT) owns an adjacent Park and Ride Lot on the north side of Thompson's Point Road that serves transit customers (both bus and train). The PTC is shown in Figure 1-1.

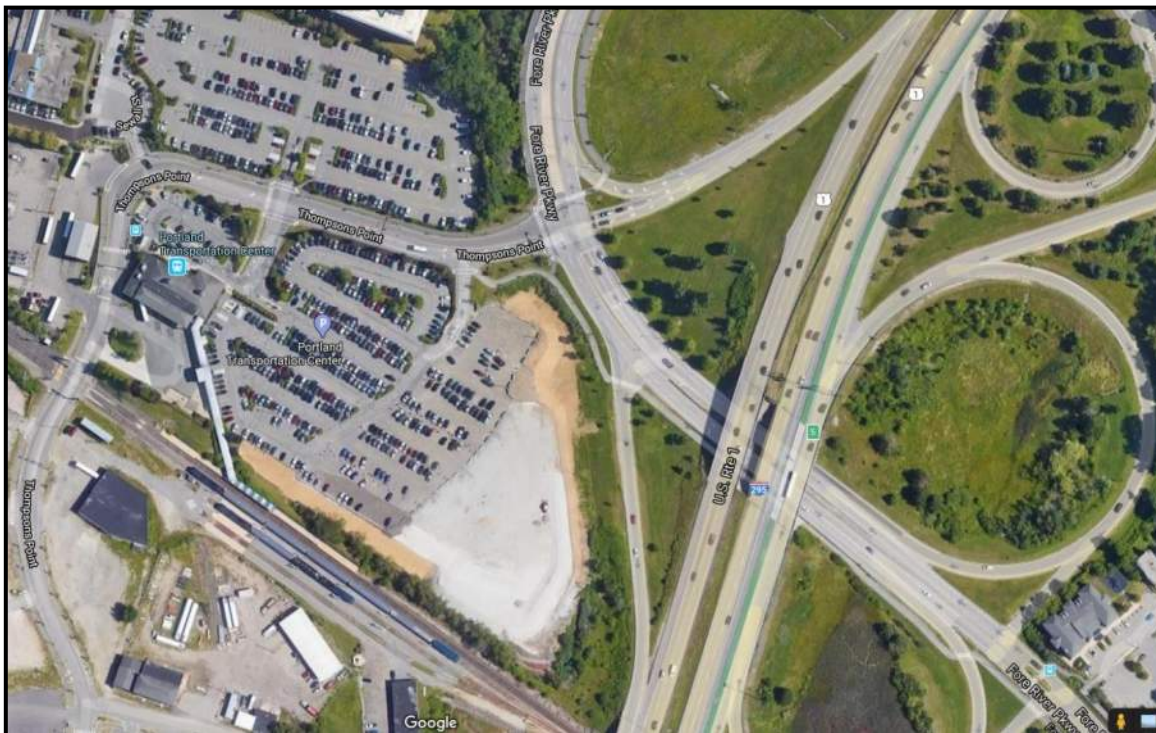


Figure 1-1: Existing Portland Transportation Center

The PTC is in urgent need of a terminal renovation, site improvements, and additional parking capacity, and if NNEPRA remains at the PTC, added train platform capacity. CCL, MaineDOT, NNEPRA, City of Portland and Forefront Properties (owners of the adjacent property south of the railroad tracks) began a discussion in 2017-18 regarding the best way to optimize use of the combined properties to serve mutual needs and potentially expand access to additional transit providers including Greyhound. CCL has begun to expand parking to the east of the existing facility, but more parking will be needed to support future parking demand. NNEPRA has indicated that the location of the station on the Mountain Division spur was impeding ridership because trains currently need to back into the spur to pick-up and discharge passengers, adding time and cost to each trip. For this reason, NNEPRA is seeking a mainline location that will maximize efficiency of the Downeaster and fully realize its ridership potential for travelers within Maine, as well as between Maine and Boston.

This Study seeks to address the following deficiencies at the existing PTC location.

- Long-term customer needs based on growing bus and rail ridership
- Transportation system opportunities to improve safety and mobility
- Additional parking capacity needs, and continued use of overflow parking area on Thompson's Point during peak periods
- Additional rail track and platform infrastructure needs to address future service levels and track capacity
- Rail operational improvement opportunities to address reverse maneuver and improve rail travel times to/from Brunswick
- Remote location that limits residents and downtown Portland/waterfront visitors from walking and biking to/from nearby neighborhoods
- Transit access improvements for local transit users
- Roadway improvements to accommodate growth at the PTC and on Thompsons Point

Sites on the rail main line just to the north and south of the Mountain Division junction that could potentially support a station and benefit from redevelopment have been identified for further evaluation.

1.3 Study Purpose

The purpose of the PTC Study is to evaluate, from a customer and transportation system perspective, various alternatives to address the existing deficiencies identified above and recommend which alternative best balances identified costs as compared to documented benefits. The PTC Study's goal is to recommend practicable solutions that enhance customer satisfaction and improve long-term mobility and safety for the region.

The Study Area (Figure 1-2) is located in Portland, Maine and includes the area bound by the existing PTC to the west, Exit 6 of Interstate I-295, the Mercy Hospital campus along the Fore River Parkway to Veterans Bridge to the east, and the St. John and Valley Street area to the existing Greyhound Station to the north. Bus station locations to be evaluated will remain within

close proximity of Interstate 295 for ease of customer access, and rail station locations to be evaluated will be located along the Mountain Division branch or rail mainline within the Study Area.



Figure 1-2: PTC Study Area Map

1.4 Phased Approach

The PTC Study presents findings in two phases. Phase 1 centered on evaluating efficiency relative to meeting customer needs and realizing transportation benefits at existing and potential new locations as well as understanding the feasibility and potential benefits and costs of relocating bus and/or rail facilities. Phase 1 findings are based on the initial analysis completed in December 2019, which determined that additional analysis and a reevaluation of key assumptions was required. The Phase 2 Alternatives Analysis focused on: maintaining CCL operations at the existing PTC location on Thompsons Point; continuing evaluation of potential benefits associated with relocating the rail station on the mainline; re-examining the benefits of the Wye track evaluated in previous NNEPRA and MaineDOT studies and the Phase 1 Alternatives Analysis; and completing a more detailed evaluation of bus and rail parking and operation requirements. Phase 2 carried forward the focus on customer efficiency, modal connections, mobility and also identified possible new locations for consideration and analysis. The Summary of Findings and

Recommendations contained in this Study are based on both Phase I and 2 information. Each Phase is presented separately.

2. Study Outreach Process

2.1 Overview

The Portland Transportation Center Study (Study) began in June of 2019. The Study Team worked with MaineDOT and the Greater Portland Council of Governments (GPCOG) to identify the key Principal Stakeholders that would be integral to the Study evaluation process. The Principal Stakeholders will help review and provide input on the alternatives being evaluated and the final recommendations from this Study.

Additionally, the Study engaged numerous other stakeholders and interested parties during the process, including the general public. These other stakeholders and public input process are defined below.

2.2 MaineDOT, GPCOG, and the Principal Stakeholders

MaineDOT is responsible for statewide transportation by all modes of travel. It manages the existing transportation system safely and efficiently, supporting Maine's economy through investment of resources for its customers, and building trust with all users and benefactors of the transportation system. MaineDOT initiated this Study, seeking to understand solutions that best address the identified needs from customer and transportation system perspectives.

GPCOG serves as the region's metropolitan planning organization and supports MaineDOT in this Study effort by providing local and regional information and staff resources. In 2020, GPCOG merged with the Portland Area Comprehensive Transportation System (PACTS), a federal metropolitan planning organization (MPO) that coordinates transportation planning and investment decisions with the state, municipalities and public transportation partners. This merger enables the two organizations to work seamlessly together on regional issues, like safe roads, public transportation, housing, economic growth and environmental sustainability, all of which demand integrated strategies. While PACTS became a part of GPCOG, it retains its MPO responsibilities.

The Principal Stakeholders were identified in June of 2019 as the key parties that would provide critical input to the Study process, analysis, and ultimate findings. An overview of each Principal Stakeholder and the identified point of contact follows.

- ***City of Portland, Maine.*** The PTC is located within the City of Portland, which is responsible for promoting and planning for future growth within the Study Area. The City's Planning and Urban Development Department is responsible for comprehensive planning, zoning, transportation planning, and working with developers and neighborhoods on future growth opportunities. Recent City of Portland involvement in the Study Area includes Thompson's Point and the Libbytown neighborhood

comprehensive planning efforts. The City of Portland representative to this Study is Helen Donaldson.

- **Concord Coach Lines (CCL).** CCL provides intercity bus service in Maine, New Hampshire, and Massachusetts. In Maine, it operates between Bangor, Maine and Boston, Massachusetts, with its largest station at the PTC in Portland, Maine. CCL owns and operates the PTC facility as well as the southerly parking lot adjacent to the station, which contains approximately 300 paved spaces today with plans to expand to approximately 560 paved spaces in the future. The CCL representative is Benjamin Blunt.
- **METRO.** The Greater Portland METRO (METRO) provides fixed-route bus service in the Greater Portland area, serving communities north to Brunswick, west to Gorham, and south to South Portland. The existing PTC is served by METRO from either its Route 1-Congress Street route or the METRO BREEZ line. METRO bus service also provides other connections to local and regional transit systems. The METRO representative is Greg Jordan.
- **Northern New England Passenger Rail Authority (NNEPRA).** NNEPRA is a public transportation authority that manages Amtrak’s Downeaster regional passenger train service between Brunswick, Maine and Boston, Massachusetts. The Downeaster has five daily round trips between Brunswick and Boston with 10 intermediate stops, including the PTC in Portland, Maine. Amtrak passengers use the existing PTC station, parking either the CCL or MaineDOT lots adjacent to the station and train platform. The NNEPRA representative is Patricia Quinn.

Four Principal Stakeholder meetings were held during the Study. Meetings were held in June 2019, August 2019, and December 2019 to discuss Study process, methodologies, assumptions, and key findings to date. Stakeholder review of the draft report occurred virtually due to the COVID-19 pandemic.

2.3 Other Stakeholders

Other stakeholders were provided updates on Study progress and asked for information as needed to contribute to Study analysis and findings. Other stakeholders contacted during the course of the PTC Study were:

- Maine Medical Center – Christopher Chop
- Mercy Hospital/Northern Light Health – Charlie Therrien
- Northern Hospitality – Chris Thompson
- Greyhound - Stephanie Gonterman
- Union Station – Brandt Sharrock

2.4 Public and Community Outreach

During the Study, the Study Team, MaineDOT, and GPCOG organized and facilitated gathering information from the general public and members of the community. Specific outreach conducted as part of this Study included:

- Customer Surveys. The Study Team, MaineDOT, and GPCOG developed and conducted a series of customer surveys of existing passengers using the PTC in the summer of 2019. The survey gathered important customer information directly that could be used to inform Study analysis and findings. Details of this survey are described in Chapter 3.
- Presentation to PACTS Committee. The Study Team provided an update to the PACTS Executive Committee on February 3, 2020. The update included a review of alternatives evaluated to date and a schedule to complete the Study Report.
- Presentation to City of Portland’s Sustainability and Transportation Committee. The Study Team provided a virtual update to the City of Portland’s Sustainability and Transportation Committee on May 20, 2020. This presentation, open to members of the general public, included a review of alternatives evaluated to date and a schedule to complete the Study Report.
- Public Comment on the Draft Report. The Draft Study report was posted to the MaineDOT webpage on January XX, 2021. Public comment was requested through email and meeting notifications and accepted until February XX, 2021. All public comments received were included in the Final Study Report.

3. Customer Surveys of Intercity Rail and Bus Passengers in Portland

3.1 Introduction

A key goal in this Study is to understand how existing PTC customers will be affected by each of the alternatives evaluated. To better understand intercity bus and rail customers, it was decided early in the Study process that a series of surveys would support the Study analysis and findings. The Study Team, MaineDOT, and GPCOG determined that Visual and Customer Intercept surveys would best gather customer information.

The Visual survey was used to understand how people arrive at the PTC – from parking, pick up/drop off, walking, biking, or via local transit. The Customer Intercept survey gathered specific information from passengers as they boarded either the bus or train at the PTC and Greyhound station, providing a greater level of detail than could be gathered from the visual survey. Details of each survey method are described in this Chapter along with key findings.

It is understood that, while the results of the surveys represent snapshots in time, the information provides statistically significant data points that can be used appropriately when estimating future conditions.

3.2 Survey Purpose

Conducting the PTC Visual and Customer Intercept Surveys achieved three principal objectives:

1. Help quantify the numbers of passenger trips to and from the PTC by their modes of access. The percentage of passenger trips made by mode served to estimate potential changes in passenger trips resulting from changes in local transit service and location of the passenger terminal which could affect walk or bike trips;
2. Help establish the correlation between PTC passengers and the number of on-site parked vehicles. Using the CCL hourly parking ingress and egress records for an entire year, a relationship was derived between passengers split into three groups by destination (i.e., to/from Logan and NYC, to/from South Station, and to/from North Station) and the number of parked vehicles by parking duration; and
3. Help to better understand the characteristics and attitudes of PTC customers as they relate to bus and rail operations and opportunities. This includes understanding customer trip purpose, frequency, specific passenger origin and destinations, and whether customers use bus, rail, or both modes when using the PTC.

3.3 Visual Survey

The Visual mode of access survey was conducted at the PTC on Wednesday, June 26, 2019. Weather conditions throughout the day were sunny and warm. Passenger counts took place

between 5:00 AM and 8:30 AM and between 11:00 AM and 8:00 PM. This 12-1/2-hour time period enabled the observation of passengers arriving that day for all five NNEPRA trains bound to Boston North Station and for 11 of the 14 pairs of CCL buses destined to Boston South Station and Logan Airport. An estimated 85% of all PTC passenger arrivals were observed and recorded.

Data on the mode of access or egress used by each person were recorded at 15-minute intervals and arriving and departing passengers tabulated by the number of persons in their entering and exiting group. Observed modes were as follows.

- Arrived or departed in a vehicle parked in one of the two onsite paid parking lots;
- Dropped off or picked up by a passenger vehicle, which included private automobiles, taxis, shared ride services such as Uber and Lyft, and privately-operated shuttle vans (e.g., Hyatt Place, Clarion, Ashton Gardens, Courtyard, Holiday Inn, Enterprise);
- Used public transit via the Metrobus and BREEZ stop adjacent to the PTC;
- Walked to or from the site. Although the majority walked along Sewall Street, it is possible that some of the passengers recorded as pedestrians walked to or from a vehicle parked on Sewall Street;
- Bicycled to or from the site; and
- Walked to or from the site in the direction of Thompson's Point. In this case, the survey was unable to observe the actual trip origin or destination and the commercial site at Thompson's Point or off-street parking in that area were assumed.

As expected, the predominant direction of travel during the early morning hours consists of passengers arriving to board a bus or train at the PTC. During the evening hours, the predominant direction of travel consists of bus and rail passengers departing PTC for their destination. During the middle of the day, arrivals and departures are relatively balanced. Figure 3-1 presents the numbers of passengers arriving at and departing from the PTC during the 60-minute period shown on the x-axis. A total of 693 passengers were observed arriving at the PTC on survey dates, while a total of 573 passengers were observed departing from the PTC. This overall arrival/departure imbalance is due largely to the count not including arriving and departing passengers over the entire 24-hour period.

As shown in Figure 3-1, the greatest number of passenger arrivals occurs in the morning before 7:15 am. For departures, the highest numbers occur after 3:00 pm with the peak occurring around 3:45 pm. The passenger arrival and departure numbers are viewed as consistent with a typical weekday, when the majority depart in the morning and arrive in the late afternoon to early evening.

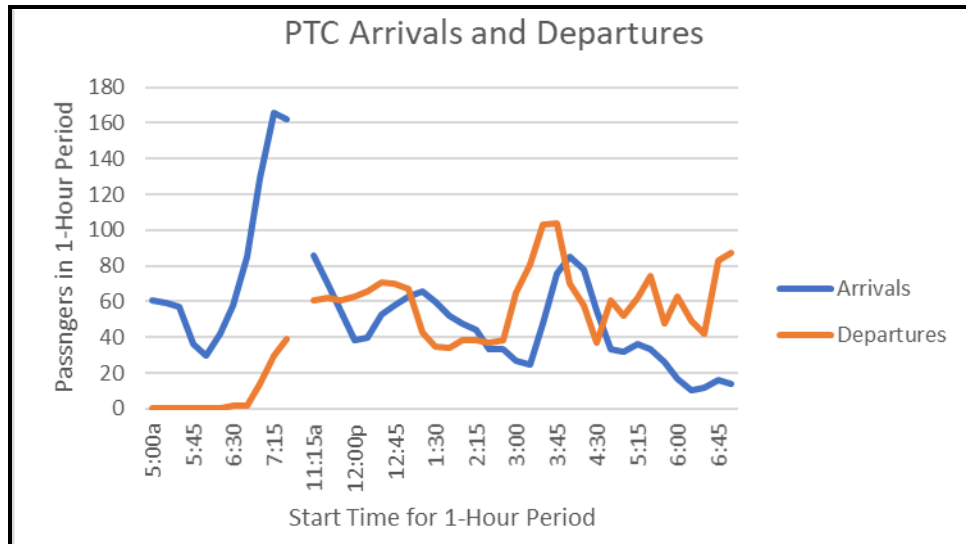


Figure 3-1: PTC Arrivals and Departures on Wednesday, June 26, 2019.

Results of the visual survey provide an initial estimate of the mode of access – passengers parking, being picked up/dropped off, walking, biking or using local transit. Table 3-2 summarizes the Visual survey mode of access results.

Mode of Access	Visual Survey
Parked on-site	39%
Dropped off	58%
Transit	1%
Walk	1%
Bicycle	1%
Total	100%

Table 3-2: Mode of Access for PTC Passengers – Visual Survey

3.4 Customer Intercept Survey

Boarding Amtrak and CCL passengers were interviewed by Study Team, MaineDOT, and GPCOG staff at the PTC on Thursday, July 18, 2019 and Sunday, July 21, 2019. Survey staff asked passengers to answer a series of questions designed to gather useful customer information and opinions on potential future conditions (Figure 3-2). A total of 504 valid surveys were gathered over the course of the two-day survey period. Boarding Greyhound passenger at the Congress Street station were also interviewed on Thursday, July 25, 2019 (weekday) and Sunday, August 4, 2019 (weekend), resulting in 24 additional usable surveys.

Approximately 25% of all bus and rail passengers were surveyed using the questionnaire during the two-day survey period. This enabled the Study to meet the goal of achieving a 95% confidence level, with a confidence interval of $\pm 5\%$ for all responses and by mode. More detailed evaluations of the data, either by date or mode, can be completed but will result in a lower confidence level and so should be used cautiously.



6:00 am CCL Bus to South Station

Why are you being surveyed?

The Maine Department of Transportation is looking to gather information about customers who use the Portland Transportation Center (PTC). For the questions below, please describe the trip you are taking now, in one direction only.

1. Where did your Trip today start?

Zip Code or City/State: _____

2. This location is your?

Home: _____ Work: _____ Store/Shopping: _____ Recreation/Vacation/Friend: _____ Other: _____

3. Where is your Trip today ending?

Zip Code or City/State: _____

4. What is the Purpose of your Trip?

Work: _____ Vacation/Recreation: _____ Shopping: _____ Other: _____

5. Number of people in your party/traveling with you: _____**6. How did you arrive to the PTC?**

Drove & Parked Your Vehicle: _____ Was dropped off: _____ Walk _____ Bike: _____ Transit: _____ Other: _____

7. If you drove and parked, would you consider parking at a nearby location and taking a shuttle if you could save money on parking?

Yes: _____ No: _____ Not Sure: _____ Depends on how much I would save: _____

8. Would you have used local transit or a local, downtown Portland shuttle if convenient to arrive at the PTC?

Yes: _____ No: _____ Not sure: _____

9. How often do you use the PTC?

Daily (3+ times per week): _____ Weekly (1-2 times per week): _____ Monthly: _____ Infrequently: _____

10. When you use the PTC, do you use?

Bus only: _____ Rail only: _____ Both bus and rail: _____

11. If the bus and rail stations were in separate locations – about a mile apart - would this matter to you?

Yes: _____ No: _____ Not sure: _____

12. Will you return to the PTC on a return Trip? Yes: _____ No: _____

If yes: Today: _____ Tomorrow: _____ Other (duration in days): _____

13. If, yes, what mode of travel will you use on your return Trip?

Bus: _____ Rail: _____ Other: _____

14. If, no, did you use the PTC to arrive in Portland?

Yes: _____ No: _____

THANK YOU FOR YOUR PARTICIPATION – PLEASE PROVIDE ANY COMMENTS ON THE BACK OF THIS SURVEY

Figure 3-2: Customer Intercept Survey Questionnaire for sample date/time

The following sections provide key findings from the visual and customer intercept surveys.

3.4.1 Question 4 – Purpose of Trip

PTC passengers were asked to describe the purpose of the trip they were taking on the day they were surveyed.

Trip Purpose	All Survey Results	Weekday Survey Results	Weekend Survey Results
Work	19%	21%	18%
Vacation/Recreation	68%	69%	67%
Shopping	1%	0%	1%
Other	12%	10%	14%
Total	100%	100%	100%

Table 3-3: Trip Purpose for PTC Customers

Table 3-3 summarizes those results, showing that vacation/recreation is the purpose of most of the trips at the PTC, approximately 2/3 of all trips taken. This notable percentage can be anticipated given the time of year the survey was taken, and that Boston and trips to Logan Airport are likely vacation or recreation oriented. The percentage of work trips is greatest during the weekday but follows a similar trend on the weekend day.

3.4.2 Question 6 - Mode of Access to Station

Most PTC respondents arrived at the station were dropped off via passenger, while one-third parked a vehicle at PTC. Remaining respondents arrived at PTC by either METRO, bicycle, or foot. The mode of access to PTC did not vary significantly between passengers on longer duration trips (e.g., to Logan Airport or New York City on CCL) and shorter duration trips (e.g., to South Station on CCL or North Station on NNEPRA). As shown in Table 3-4, most passengers are dropped off at the station by passenger vehicle, with the long duration trips having a slightly higher percentage being dropped off (63% versus 60%). These results are comparable to the visual survey results described in Section 3.2. For the Greyhound passengers surveyed, 8% park, 54% are dropped-off, 15% walk, and 23% use transit.

Mode of Access	All PTC Interviews	Logan Airport & New York City (CCL) Passengers	South Station (CCL) and North Station (NNEPRA) Passengers
Parked on-site	33%	32%	34%
Dropped off	60%	63%	59%
Transit	3%	4%	3%
Walk	3%	1%	3%
Bicycle	1%	0%	1%
Total	100%	100%	100%

Table 3-4: Mode of Access for PTC Passengers

Visual and Customer Intercept survey results were combined to estimate existing mode of access percentages described in Chapter 5.

3.4.3 Question 7 - Acceptability of Discounted Remote Parking

Passengers arriving in a vehicle parked on-site were asked whether they would consider using discounted remote parking with a shuttle bus to and from the PTC (Table 3-5). The highest proportion of respondents indicated they were unsure, with half of those indicating that the amount of monetary savings would affect their decision. Equivalent portions of the respondents answered either “yes” or “no.”

Passenger Willingness to Use Discount Remote Parking	CCL	NNEPRA
Yes	23%	18%
No	26%	13%
Depends on Savings	15%	11%
Not Sure	13%	12%
No Answer	24%	47%
Total	100%	100%

Table 3-5: Willingness to Use Remote Discount Parking for PTC Passengers who Park on-site

Survey respondents noted several factors influencing their acceptance of remote discount parking, namely trip purpose/duration, cost savings, distance of parking from the PTC (in particular, the time to travel by shuttle to and from PTC), and frequency and reliability of shuttle transport. Shuttle reliability is a key concern because while airport passengers must allow time for TSA screening, CCL and NNEPRA passengers can essentially arrive at the PTC within minutes of a scheduled departure and still have adequate time to board. Conversely, a five minute delay in getting to the airport is likely to have minimal effect on an airline passenger making the scheduled departure on-time; however, such a delay could cause a CCL or NNEPRA passenger to miss a bus or train if arriving within 5 to 10 minutes of a scheduled departure.

3.4.4 Question 8 - Potential Usage of a Downtown Portland Shuttle

Survey respondents were asked whether they would use local transit or a downtown shuttle for their trip to the PTC if it was convenient, to which about half of the respondents (51%) responded affirmatively while 30% responded they would not. The remaining 19% were not sure. The need for a local/downtown shuttle has been previously identified as a desired service by PTC customers and the response indicates a strong opportunity for this service to be successful.

3.4.5 Question 10 – Using Bus and Rail

To ascertain the level of familiarity and experience that PTC passengers have with all transit services between PTC and Boston, CCL and Greyhound passengers were asked whether they had ever used NNEPRA and vice versa (Table 3-6).

Carrier/Service	Alternate Service Used	Respondents Using Alternate Service
CCL Service to South Station/NYC	NNEPRA	46%
CCL Service to Logan Airport	NNEPRA	38%
NNEPRA Service to North Station	CCL	47%

Table 3-6: Synergy between Rail and Bus Service at the PTC

Almost 50% of PTC customers have used both bus and rail when using the PTC. The higher percentages are associated with trips to from Boston’s North and South Stations vs. trips to/from Logan Airport.

To assess same-trip synergy between the Portland-Boston transit services, PTC passengers departing Portland were asked whether they expected to return to Portland for their current trip and, if so, on what travel mode. Approximately 11% of the PTC passengers reported their return trip would be via the other travel mode. In other words, approximately 11% of NNEPRA passengers to North Station intended to return to Portland via CCL service with a comparable percentage of CCL passengers to South Station returning to Portland via NNEPRA service.

To correlate and compare these same trip/different mode results, data collected for the CCL and MaineDOT lots adjacent to the PTC for one year was used to compare vehicle arrival time, likely departure time and service options. Similarly, potential “return-to-PTC” travel schedule and carrier were analyzed based on the time of departure from the parking lot associated with individual parking transactions. Based on this analysis, an estimated 5% of passenger roundtrips between the PTC and Boston use different carriers for the two trip legs.

Based on these results, we estimate that between 5-10% of all trips at the PTC are using different modes within the same round trip.

3.4.6 Question 12 - Parking Duration at PTC

Passengers expecting to return to the PTC were asked the length of their trip in days. For passengers arriving in a vehicle and parking on-site, this trip length also represents the duration of time their vehicle is parked at the PTC. Reported parking duration averaged 3.4 days. This value compares to the overall average parking duration of 3.6 days estimated from parking transactions data provided by CCL for the period from July 2018 through June 2019.

Parking duration varied according to the carrier used by the passenger (Table 3-7) and service destination. The maximum average parking duration occurred for CCL passengers traveling to Logan Airport, when the average parking duration was 6.7 days. Shorter parking durations were reported for those using CCL service to New York City or South Station and NNEPRA service to North Station.

Carrier/Service	Average Parking Duration
CCL Service to Logan Airport	6.7 days
CCL Service to New York City	4.3 days
NNEPRA Service to North Station	2.3 days
CCL Service to South Station	1.3 days

Table 3-7: Average Parking Duration by Carrier and Service

3.5 Maine Users of the PTC

A separate analysis used survey data to determine where in Maine PTC customers originate. While not all PTC customers are from Maine, understanding where Maine users live leads to a better understanding of whether alternate locations could encourage walk, bike, and transit usage as a way of reducing parking demand.

Trip origins taken from the survey data were grouped into three generalized locations: (1) the three communities whose residents, visitors, or workers are closest to the PTC – Portland, Westbrook, and South Portland; (2) communities in the remainder of the PACTS region; and (3) communities throughout the remainder of Maine (Table 3-8). Of note is that a significant proportion of PTC boarding passengers travel a relatively long distance to the station. Of those originating in Maine, 38% of CCL passengers to Logan Airport, 43% of CCL passengers to New York City, 31% of CCL passengers to South Station, and 55% of NNEPRA passengers to North Station are from outside the PACTS region. A smaller, but relatively consistent portion of the PTC passengers start their trip close to PTC in either Portland, Westbrook, or South Portland. The lowest percentages occur for the services that primarily serve customers who will not return for at least several days – CCL service to New York City and Logan Airport, while the highest percentage is associated with CCL service to South Station.

Region	CCL Passenger ¹			NNEPRA Passenger ²
	Logan Airport	New York City	South Station	North Station
Portland, Westbrook, South Portland	28%	27%	35%	30%
Remainder of PACTS region ³	34%	30%	34%	15%
Remainder of Maine	38%	43%	31%	55%
Total	100%	100%	100%	100%

Table 3-8: Geographic Origins of Maine Passengers Boarding at the PTC.

¹ The Maine address for CCL passengers is the billing address for the person purchasing a CCL ticket for passage to Boston and is derived from annual web sales transactions provided by CCL.

² The Maine residence for NNEPRA passengers is based on NNEPRA-provided information on passenger demographics.

³ Biddeford, Falmouth, Gorham, Saco, Scarborough, Yarmouth, Arundel, Cape Elizabeth, Cumberland, Freeport, North Yarmouth, Raymond, Standish, and Windham

Trip origin data taken from the surveys presented above was later combined with annual NNEPRA zip code boarding data to refine the Maine origin of passengers using the PTC.

3.6 Bus and Rail Passenger Synergy

Based on interviews conducted with NNEPRA and CCL passengers boarding at PTC, an estimated 5 to 10% of passengers who travel to South Station or North Station in Boston on one mode (i.e., rail or bus) return to PTC via the other mode for a single round trip. If the NNEPRA and CCL station locations are bifurcated, a return trip to a separate station location from a passenger's departure only requires the pick-up driver to travel to the other station location. For passengers that arrive by transit, both station locations are assumed to be fully served by the expanded METRO service. However, a passenger who drives and parks at one location will require transport (likely via shuttle bus or regular METRO service) from the other station.

In the 2040 forecast year, approximately 300 passengers arrive each day in a vehicle and park on-site to ride either NNEPRA to North Station or CCL to South Station. Under the assumption that between 5 and 10% of these passengers ride a different mode on the return trip, an estimated 15 to 30 passengers per day would require a shuttle or some means of local transportation between the parking lots at bifurcated stations. Additionally, between 38% and 47% of passengers may use both bus and rail modes at the PTC during different trips. With bifurcated stations, the ability for these passengers to readily shift between modes will be notably reduced.

The potential for up to 47% of passengers to use both modes, primarily for trips to and from Boston, points to a strong synergy for customers to use both bus and rail depending upon their trip purpose and other considerations, including schedule, time of day, and cost.

4. Integrating Transportation Facilities

4.1 Introduction

An important element of this Study is to assess the benefits and impacts of keeping bus and rail operations in the same station location, balancing whether they are significant enough to offset other benefits that may be achieved by relocating the rail station to a separate location, bifurcating bus and rail operations.

Based on the customer survey data, approximately 10% of PTC passengers use both bus and rail. Based on an average monthly boardings of 25,000 bus and rail passengers⁴, this could result in up to 2,500 passengers utilizing both modes at some point. Intercept survey data provided by NNEPRA⁵ from Downeaster passengers indicates that 1/3 of all rail passengers would use bus if rail was not available, supporting the finding that some passengers do use both bus and rail depending on specific circumstances. While passengers may not use both modes each time, the current combination of bus and rail at the PTC can allow passengers to travel to Boston on one mode and return on the other readily knowing they can either access their parked vehicle, be picked up at the same location they were dropped off, or use the same alternate modes to and from the PTC.

4.2 Case Studies

The Study Team performed a literature search for similar bus and rail station studies to understand potential advantages or disadvantages posed by consolidated transportation facilities to passengers, facility operations, and the municipalities in which they reside. Although the Study Team did not find case studies mimicking the questions posed regarding the PTC, several case studies do illustrate some potential advantages and disadvantages of collocating rail and bus passenger facilities.

- 4.2.1 William Walsh Regional Transportation Center (RTC), Syracuse, NY. The RTC serves Syracuse's approximately 150,000 residents (2018) and 27 million visiting tourists (2017) by providing collocated intercity rail and bus services. Prior to creation of the RTC in the 1990s, rail and bus services had not operated out of a united facility since the 1960s. In creating a unified facility, rail and bus providers focused on improving the passenger experience with accessibility and connectivity and, as a result, passengers note enhanced convenience associated with making transfers between services. With over 28% of the working population in Syracuse using

⁴ Monthly boardings based on March 2019 Concord Coach and Downeaster boarding data provided by CCL and NNEPRA

⁵ Survey data provided by NNEPRA to Study Team in March 30, 2020 email

transit, consolidating transit providers at the RTC has led to sustainability of transportation services as well as a demand for restaurants, gift shops, and taxis at the facility. The availability of both short- and long-term parking supports additional hospitality services being provided at the RTC. However, despite these positive aspects of collocation, moving the bus facilities to the RTC, which is located north of the city, means that there is no meaningful contribution of either service to downtown redevelopment.

- 4.2.2 JMR Intermodal Transportation Center (ITC), Savannah, GA. Serving a similar resident population size to the RTC, the ITC sees approximately 35% of the daily commuters in Savannah and, in 2017, 14 million visiting tourists passed through on one or more of its transit facilities. Rail and bus facilities are bifurcated, with intercity, local and regional bus operated separately from Amtrak's rail service. Passengers note intentional rail and bus synergies that are maintained despite the separation of services, such as ease of connections between local and intercity buses, safe and easy bicycle and pedestrian access, and bus connections to the airport and Amtrak station. While ancillary services are available, no passenger parking is available at the ITC. Even with infrastructure limitations associated with the rail line being located outside of downtown, the ITC generally supports efficient, LEED Gold certified, mixed-use development in surrounding areas.
- 4.2.3 Fort Worth Central Station, Fort Worth, TX. As a city of approximately 900,000 residents (2018), Fort Worth is significantly larger than either Syracuse or Savannah; however, with about 5% of daily commuters using transit services, approximately the same number of daily travelers are served (~150,000) as in the two prior case studies, along with 5 million visiting tourists annually (2017). Central Station is an intermodal facility located on the edge of downtown Dallas-Fort Worth. While not strictly downtown, its close proximity to commercial and retail, institutional uses, educational facilities, and parking lots under development enhance connectivity for those traveling via vehicles as well as for bicyclists and pedestrians.

4.3 Benefits of Consolidated Transportation Facilities

Successful transportation centers focus on passenger connectivity and conveniences as well as the provision of better facilities. Based on the case studies summarized in Section 4.2, we conclude that converging multiple modes at a single node:

- Increases ridership;
- Helps local transportation agencies develop priority corridors;
- Improves efficiency;
- Addresses bicycle/pedestrian safety issues;
- Improves transit access and equity; and
- Increases viability of state/federal funding support.

Consolidated facilities are sustainable in that they support efficient land use; improve mobility and reduce VMT; and enhance viability of operational service and maintenance. Clustering transportation services has a direct correlation to economic development by attracting businesses, supporting services in and around stations, and encouraging higher intensity land uses. By contrast, bifurcating modes can have the opposite effect, enabling less dense land use around 'stand-alone' locations. Co-location of transportation services aligns itself with sound planning principles and addresses vital issues including passenger choice, transportation connectivity, economics, access and egress, funding and sustainability. A range of principles and issues are discussed below.

4.3.1. Passenger Choice and Connectivity. From the passengers' perspective, collocating multiple modes offers choice and flexibility based on the time and nature of travel. Providing multiple options can be an influencing factor in mode shift of a passenger from the auto mode to public transportation. Lack of choice in terms of frequency, comfort and fares can often dissuade passengers from shifting from the auto mode to the public transit mode. More than one mode of transportation at the same location also provides redundancy in transportation options, which can be critical during times of service disruption.

4.3.2 Providing Local Transit Services. One of the key aspects gleaned from the case studies described in Section 4.2 was that for a transportation center to be successful, it needs to be well served by the local transit system. Bifurcation of the transportation facilities presents more challenges to ensuring that the same level of local transit service is provided at multiple locations.

4.3.3 Access and Egress. Ease of access and egress constitutes a key element for any transportation center. This includes providing parking facilities as well as priority transit routes connecting the transportation center to other areas. Collocating services brings together a larger number of passengers and so the requisite investments in parking facilities can potentially be addressed at a single location, rather than at multiple locations. The resources needed for designation of priority corridors and implementation of traffic engineering controls is significantly less for a single location, rather for multiple locations.

4.3.4 Passenger Amenities. Bringing together passengers at a single location may provide the critical mass necessary to attract private retail and other services, such as high-speed internet. A larger number of passengers and longer combined operating hours associated with multiple modes of transportation can also result in longer durations of open waiting areas and service offerings. In this manner, co-located facilities reduce personnel costs associated with manning the transportation center.

4.3.5 Funding. A collocated facility ensures that capital and O&M investments made towards the development and operation of the transportation center are used most efficiently, rather than different modes seeking out individual investment dollars at separate facilities. Planned

consolidated investments may also make it easier to solicit and obtain funds from a variety of sources.

4.3.6 Economic Impacts. Grouping of transportation services can be a deciding factor in the relocation or expansion of businesses. Findings of a recent study undertaken by Economic Development Research Group (EDRG) titled “The Evolving Connection of Transit, Agglomeration and Growth of High-Tech Business Clusters”⁶¹ details how high-tech business clusters are evolving so that bus and rail solutions are becoming enablers of their continuing and future growth.

4.3.7 Future Growth/ Development/ Provision of Additional Services. Collocating multiple modes of intercity travel ensures that any future transit actions would serve the needs of a broader spectrum of the population. If additional local transit connections are brought to a single, established location, transit riders will have broader options for intercity travel moving forward. The transportation nucleus can more effectively anchor future higher intensity residential and commercial developments rather than exacerbating dispersed development patterns.

4.3.8 Sustainability. Aggregated services and higher intensity of land use ensure a higher degree of inherent fiscal and environmental sustainability. A collocated facility reduces consumption of resources associated with the operations and maintenance of the facility as well as land area required. A shared facility is also a fiscally efficient approach, as infrastructure usage is maximized. This factor is diluted if the facilities for the two transportation modes are bifurcated.

4.4 Regional Public Transportation Vision

PACTS developed a 30-year plan focused on building the Greater Portland region’s public transportation network. Coined “Transit Tomorrow”, this long-range plan centers on improving the region’s economy, environment, and quality of life by making transit easier, expanding local connections, and introducing rapid transit. Some of the benefits of consolidated facilities discussed in Section 4.3 support Transit Tomorrow recommendations, which include adopting a unified mobility platform, strengthening coordination among providers, feeding rapid transit corridors, and maintaining a regional perspective. The long-range vision of Transit Tomorrow is echoed in Moving Southern Maine Forward, the short-range plan developed by GPCOG and PACTS, which includes public transportation projects being implemented in the region aimed at improving the customer experience. Two of the tenants of this short-range plan are particularly relevant to this study:

⁶¹http://www.edrgroup.com/pdf/the_evolving_connection_of_transit_agglomeration_and_growth_of_high_tech_business_clusters_trb.pdf

- Better connect routes and schedules of transit providers; and
- Improve access to stops and stations.

Short and long-range transportation plans for the Greater Portland region directly link public services to local and regional land use decisions. In 2018, Portland and South Portland released their Smart Corridor Plan, which seeks to balance the needs and priorities of all roadway users and stakeholders along a critical 7-mile roadway corridor connecting these two cities and many of their neighborhoods and activity centers. The Smart Corridor Plan reinforces the connection between land use patterns and public transportation services, establishing the objective of high-quality development in the corridor. This plan did not evaluate the PTC and its role in serving regional transportation needs but its stated objectives to improve safety in all travel modes, manage traffic access and congestion in the corridor, and improve travel options and multimodal access in the corridor are inextricably tied to land use decisions, such as those involving development patterns and the collocation and coordination of transportation services by establishing “multimodal mobility hubs”.

4.5 Conclusion

Survey data presented in Chapter 3 identified that approximately 10% of passengers who use the PTC will utilize both bus and rail modes for the same round trip. These values increase to between 38% and 47% of passengers who may use both bus and rail modes at the PTC during different trips.

While no specific case study was identified that supports or rejects the claim that having separate bus and rail station is the better for the customer, the information gathered does provide basis that collocating bus and rail operations provides benefits beyond simple mode choice at a single location. These benefits can include increased ridership, improved efficiencies which can reduce costs, improved coordination with other modes such as local transit, and provide enhanced economic and funding benefit opportunities.

Based on the survey results in Chapter 3 and the findings described in this Chapter, it is recommended that maintaining collocated bus and rail facilities be considered to maximize the benefit to customers, improve operational and maintenance efficiencies, and create enhanced land use and economic benefit opportunities. However, these benefits must be weighed with potential system-wide benefits that increase ridership and transportation mobility.

5. Phase 1 Alternatives Analysis

5.1 Phase 1 Introduction

The original scope of this Study did not envision a multi-phased analysis. It was intended that a recommendation or series of recommendations would be identified through the initial analysis and summary. As previously identified in Section 1.4, a second phase of the PTC Study was added after additional alternatives and the need to reevaluate key assumptions arose as a result of the Phase 1 analysis.

The Phase 1 results provided in this Chapter provide a strong foundation and focus for the Phase 2 Alternatives Analysis discussed in Chapter 6.

5.2 Phase 1 Objectives

Phase 1 had the following objectives.

- Focus on Customer Efficiency, Modal Connections, and Mobility. The overarching Study Purpose is to focus on customer needs and transportation benefits in evaluating existing and potential new locations.
- Understand the Feasibility and Value of Potentially Relocating the Bus and/or Rail Facilities. The Phase 1 alternatives analysis evaluates the potential to relocate the bus and/or rail facilities to new locations, as well as understand the associated costs, benefits, and feasibility.
- Assess Current and Future Bus and Rail Operation Needs. Bus and rail passenger needs continue to evolve. The Study evaluates current and future operation needs, including parking, ridership, safety, and connectivity.

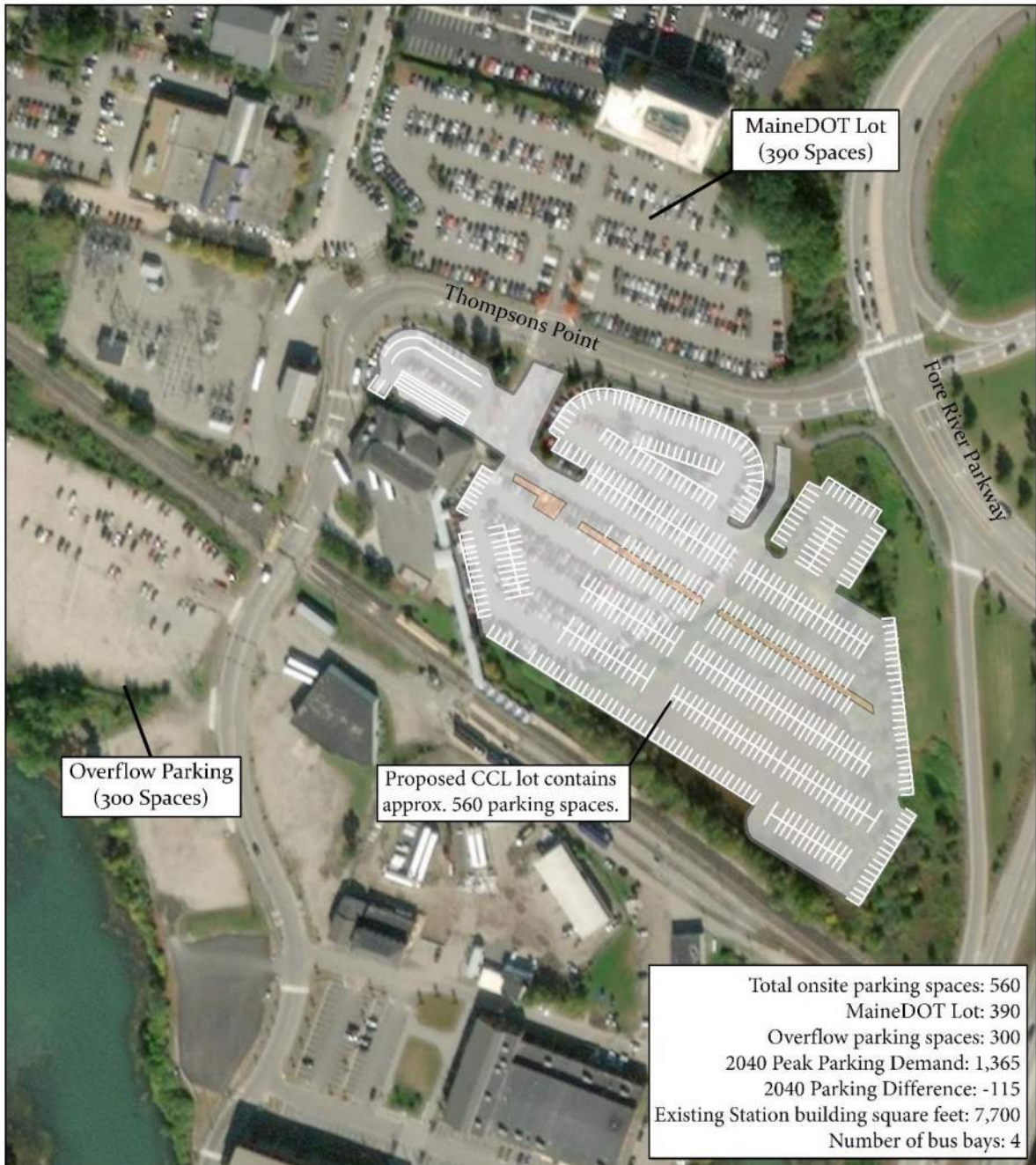
5.3 Identified Alternatives


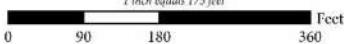


Four primary alternatives were evaluated as part of the Phase 1 analysis. After initial discussion, several alternatives were expanded to evaluate each based on full- and short-term parking needs, as well as separating bus and rail station locations. Identified alternatives are as follows.

- **No-build Alternative:** Existing PTC Location on Thompson's Point for bus and rail with only planned and funded improvements
- **Alternative 1:** Existing PTC Location on Thompson's Point for bus and rail with additional improvements, including the Wye Track for rail
- **Alternative 2a:** New Location on Fore River Parkway for bus and rail, serving all required parking needs
- **Alternative 2b:** New Location on Fore River Parkway for bus and rail, serving short-term parking needs only
- **Alternative 3a:** New Location on St. John Street for bus and rail, serving all required parking needs
- **Alternative 3b:** New Location on St. John Street for bus and rail, serving short-term parking needs only

- **Alternative 4a:** Existing PTC Location for bus with new rail station on Fore River Parkway
- **Alternative 4b:** Existing PTC location for bus with new rail station on St. John Street

A conceptual layout was developed for each alternative, identifying how each location could accommodate the required parking, station, access, pick-up and drop-off areas, and rail platform and track infrastructure required. The conceptual layouts represent a limited engineering evaluation of each location (Figures 5-1 through 5-8).



<p>Figure 5-1 No Build Alternative</p>	<p> Parking Lot Sidewalk </p>	<p>Produced for:  </p>
<p>Existing PTC</p>	<p> 1 inch equals 175 feet  Feet  </p>	<p>Produced by:  </p>

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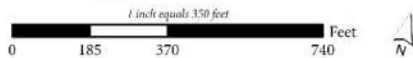


Total onsite parking spaces: 1,065
 Overflow parking spaces: 300
 2040 Peak Parking Demand: 1,365
 Station building square feet: 20,000
 Number of bus bays: 6

Figure 5-2
 Alternative 1

Existing PTC
 with Wye Track

- Platform
- Station
- Walkway
- Proposed Wye Track & Other Rail Modifications
- Existing Rail Lines
- Proposed Grade Crossings



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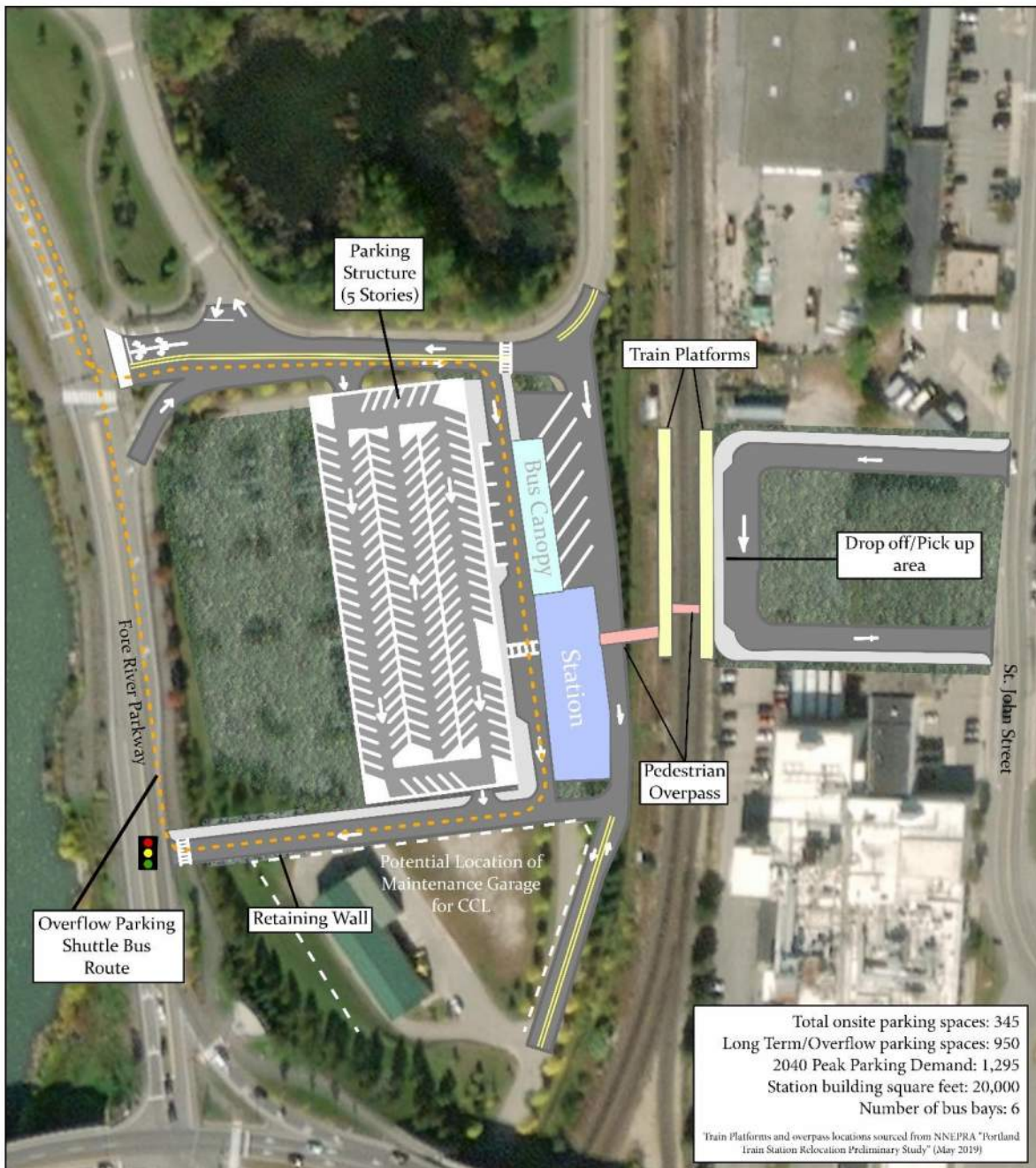
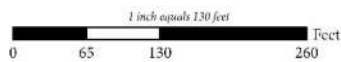


Figure 5-3
Alternative 2a

Fore River
Parkway

- Proposed Station
- Bus Canopy
- Pedestrian Overpass
- Parking/Roadway
- Train Platform
- Sidewalk



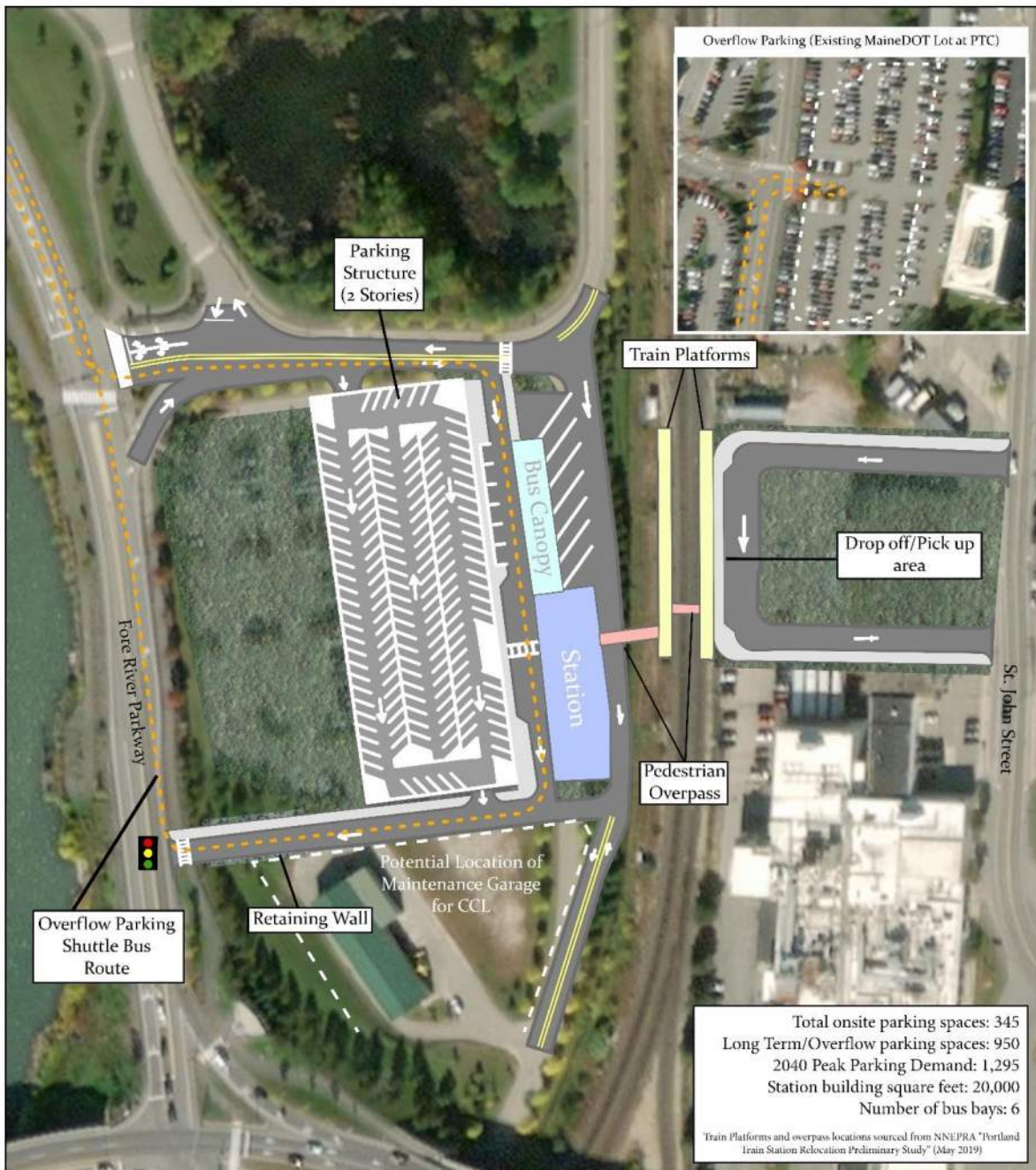
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Total onsite parking spaces: 345
 Long Term/Overflow parking spaces: 950
 2040 Peak Parking Demand: 1,295
 Station building square feet: 20,000
 Number of bus bays: 6

Train Platforms and overpass locations sourced from NNEPRA "Portland Train Station Relocation Preliminary Study" (May 2019)

<p>Figure 5-4 Alternative 2b</p> <p>Fore River Parkway</p>	<p>Proposed Station</p> <p>Bus Canopy</p> <p>Pedestrian Overpass</p>	<p>Parking/Roadway</p> <p>Train Platform</p> <p>Sidewalk</p>	<p>Produced for:</p> <p>Produced by:</p>
	<p>1 inch equals 130 feet</p> <p>0 65 130 260 Feet</p>		

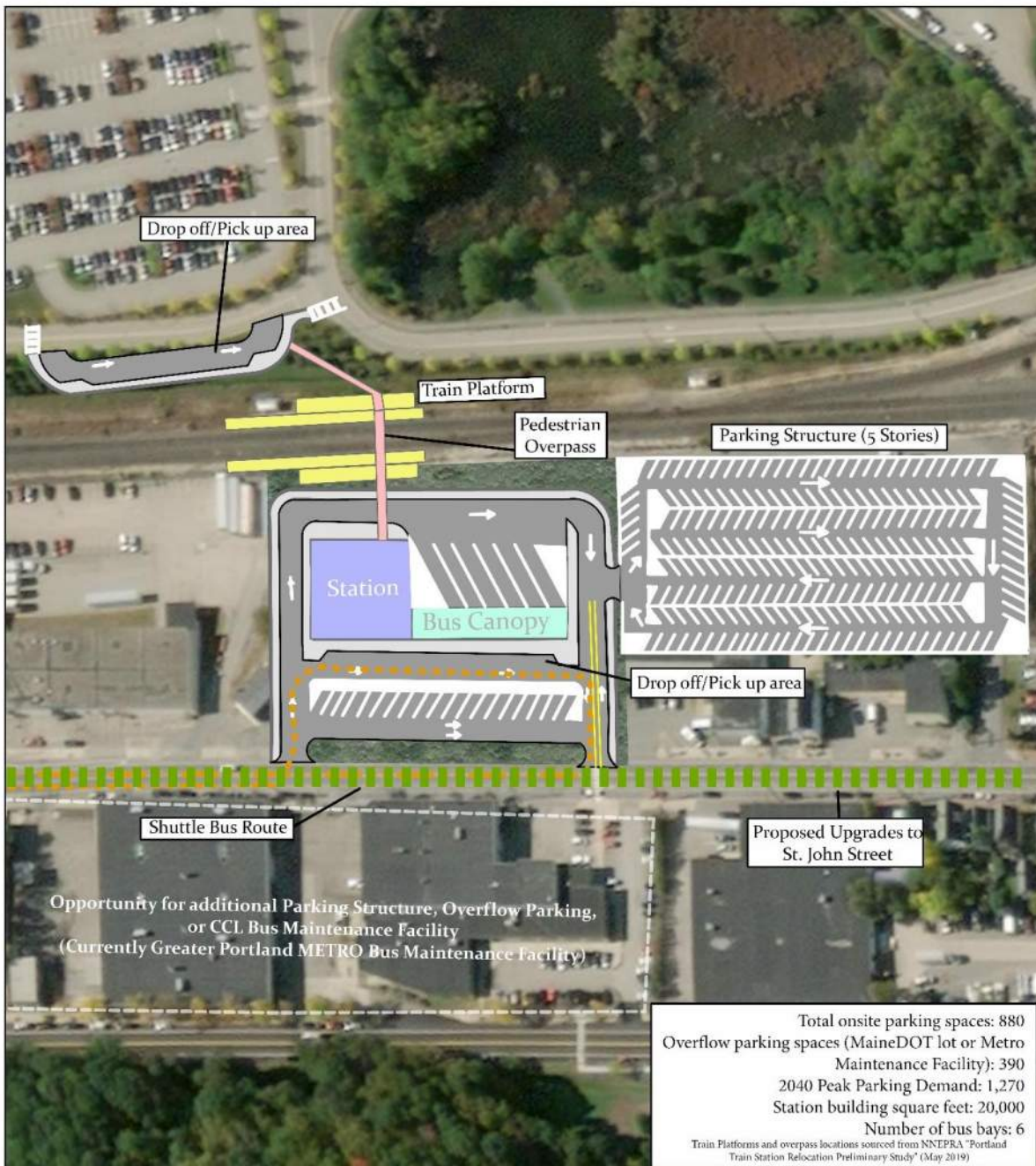


Figure 5-5
Alternative 3a

Project
Site

- Proposed Station
- Bus Canopy
- Pedestrian Overpass
- Parking/Roadway
- Train Platform
- Sidewalk



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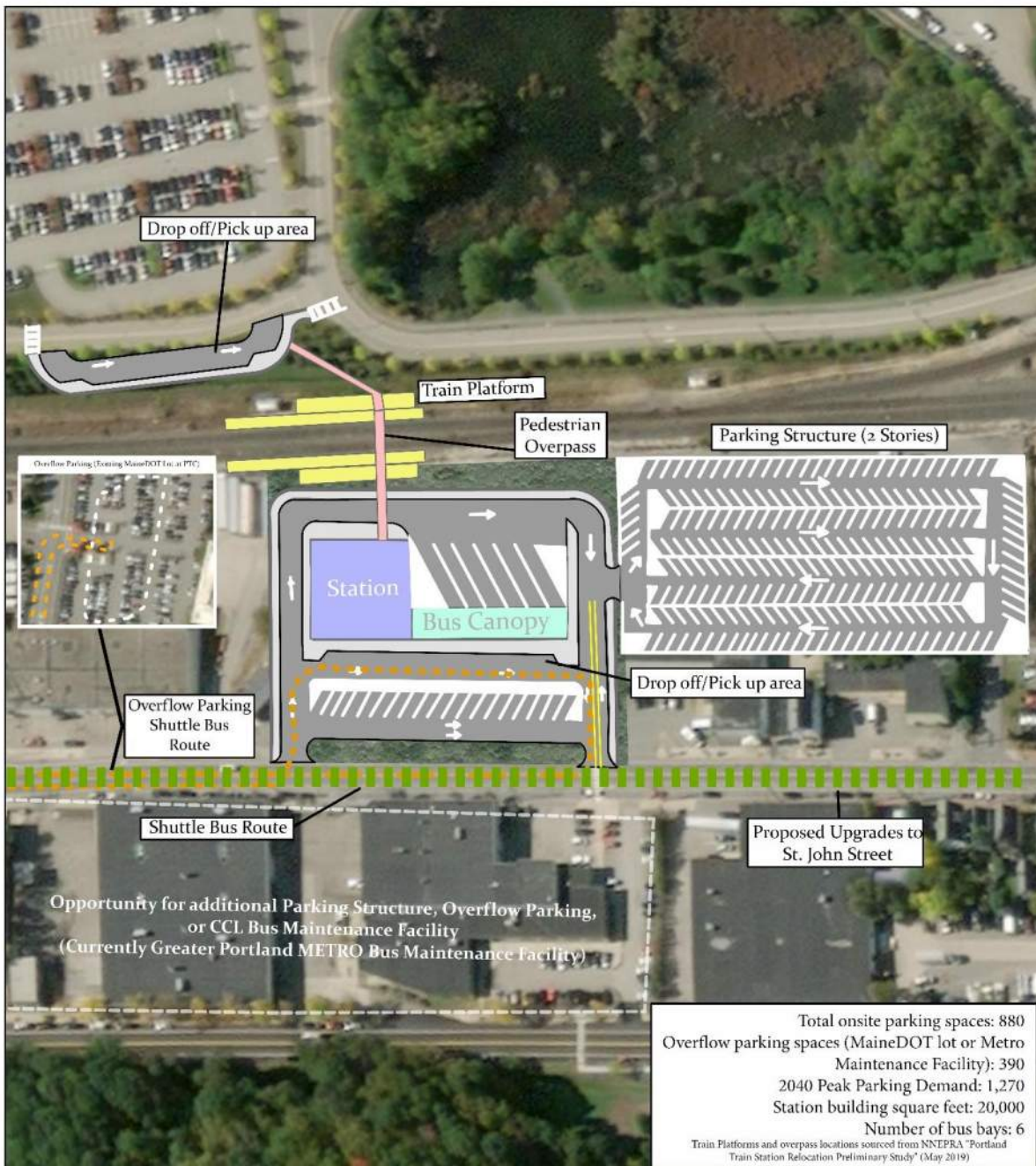


Figure 5-6
Alternative 3b

Project
Site

- Proposed Station
- Bus Canopy
- Pedestrian Overpass
- Parking/Roadway
- Train Platform
- Sidewalk



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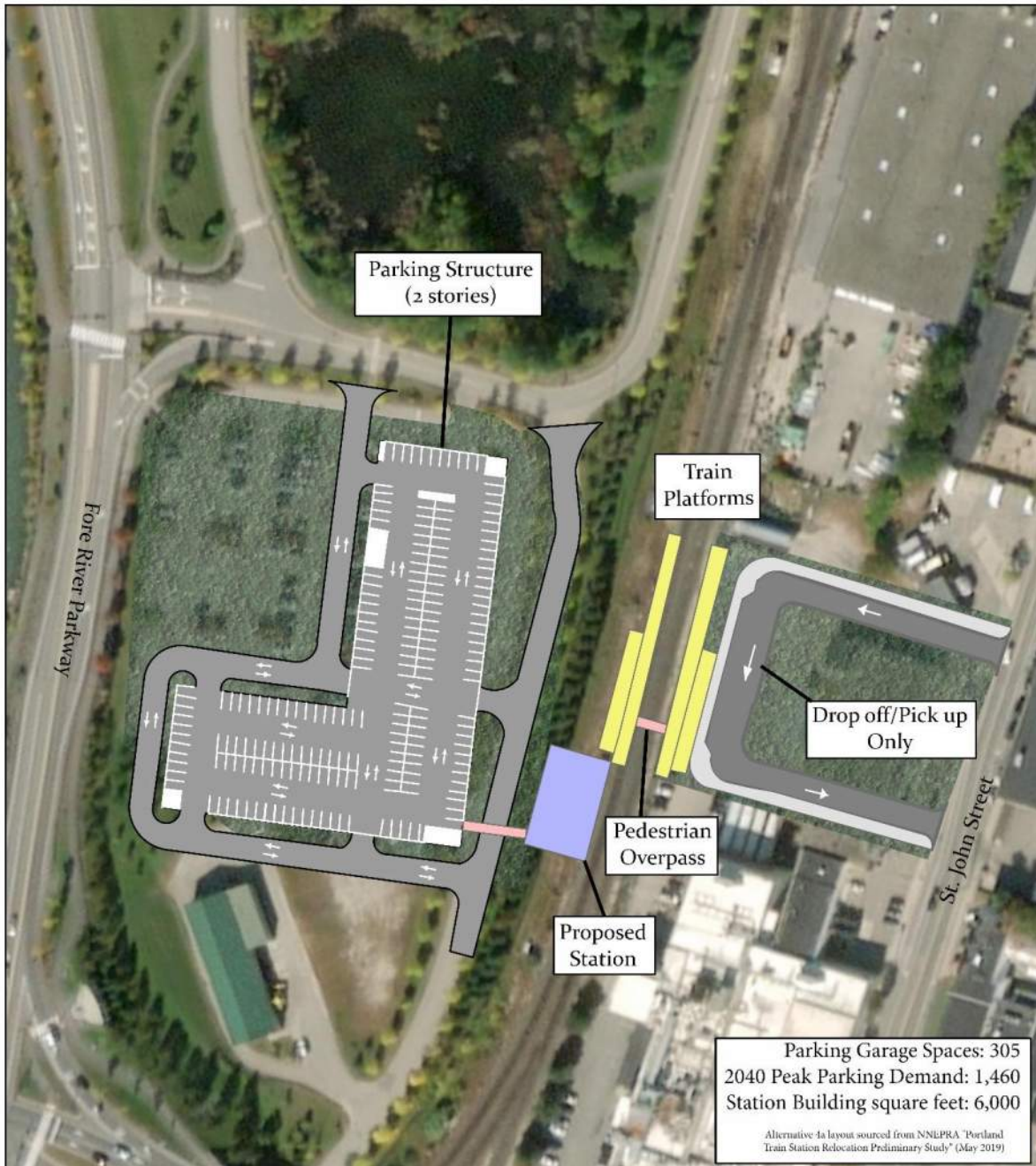








Figure 5-7
Alternative 4a

Fore River
Parkway

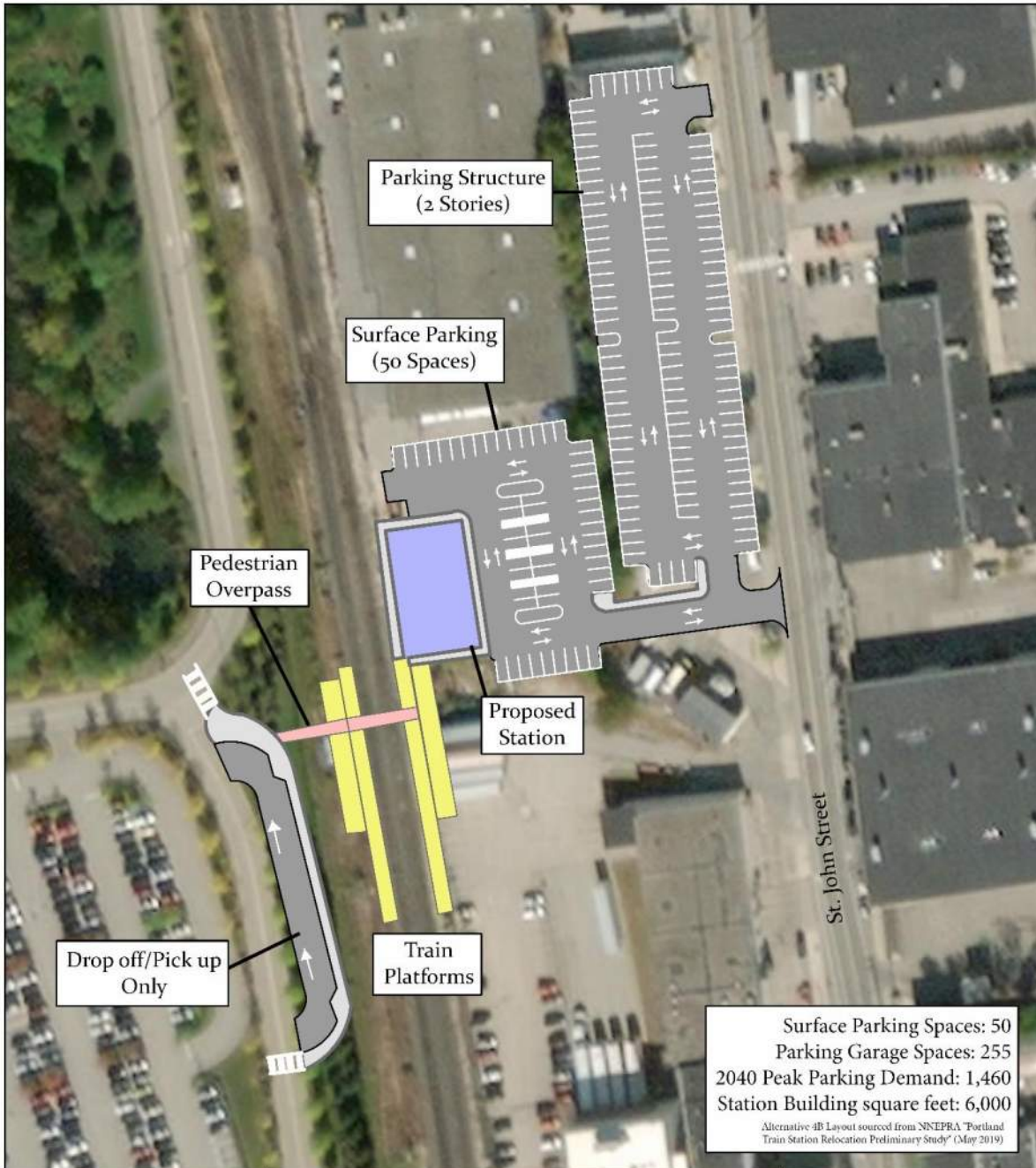
	Proposed Station		Parking/Roadway
	Bus Canopy		Train Platform
	Pedestrian Overpass		Sidewalk


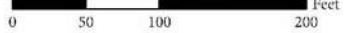


1 inch equals 125 feet

0 65 130 260 Feet

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<p>Figure 5-8 Alternative 4b</p>	<table border="0"> <tr> <td> Proposed Station</td> <td> Parking/Roadway</td> </tr> <tr> <td> Bus Canopy</td> <td> Train Platform</td> </tr> <tr> <td> Pedestrian Overpass</td> <td> Sidewalk</td> </tr> </table>	 Proposed Station	 Parking/Roadway	 Bus Canopy	 Train Platform	 Pedestrian Overpass	 Sidewalk	<p>Produced for:</p> 
 Proposed Station	 Parking/Roadway							
 Bus Canopy	 Train Platform							
 Pedestrian Overpass	 Sidewalk							
<p>Project Site</p>	<p style="text-align:center">1 inch equals 100 feet</p>  <p style="text-align:right">Feet</p> 	<p>Produced by:</p> 						

5.4 Estimated Change in Passenger Ridership

Changes in passenger ridership can be anticipated if a change in the location of the bus and/or rail station results in a change in operating travel times for NNEPRA, CCL, or Greyhound for the carriers. This change in operating times can be either a benefit or detriment to ridership. Previous NNEPRA study data for rail operating time changes and PTC Study travel time runs were used to estimate anticipated changes in NNEPRA, CCL, and Greyhound service travel times for the locations associated with Alternatives 1 through 4b (Table 5-1).

Alternative	Mode	Travel Time Change		
		Between Brunswick and Boston	Between Brunswick and Portland	Between Portland and Boston
Alternative 1: Wye Track	Rail	-9 minutes	-5 minutes	No Change
Alternatives 2a, 2b, 4a (Fore River Parkway)	Rail	-16 minutes	-10 minutes	-1 minute
Alternatives 3a, 3b, 4b (St. John Street)	Rail	-16 minutes	-10 minutes	-1 minute
Alternative 1: Wye Track	Bus	-	-	No Change
Alternatives 2a, 2b, 4a (Fore River Parkway)	Bus	-	-	+1 minute
Alternatives 3a, 3b, 4b (St. John Street)	Bus	-	-	+3 minutes

Table 5-1: Change in Service Travel Times by Mode and Alternative

Travel time change estimates are used to determine change in ridership based on intercity travel elasticities. Ridership elasticities provide an estimate of the rate of ridership change based on the rate of travel time change. An October 2015 Northeast Corridor⁷ report provides estimates for elasticity between transit service travel times and passenger ridership. Separate elasticities are provided for commuter travel, business travel, and non-business travel. The PTC interviews conducted as part of this overall study provide trip purpose distributions for each carrier and service destination. Based on the elasticities 2015 report, it is assumed that there will be a 0.65 change in ridership for every 1 percent change in travel time for commuter/business trips, and a 1.2 change in ridership for every 1 change in travel time for all other trips.

For these metrics, passenger ridership for bus and rail in the 20-year forecast timeframe are assumed to be 44 percent above current values. The 44 percent growth in volume is based on the Portland Transportation Center Parking Facility Study, prepared for MaineDOT by AECOM in

⁷ AECOM Northeast Corridor Future Ridership Analysis Technical Memorandum, October 2015

February 2018, which presents a base growth scenario that has an annual growth rate of 2.2 percent. Application of this growth rate over a 20-year period yields a growth factor of 1.44, or 44 percent, for the number of NNEPRA, CCL, and Greyhound passengers. Using this formula, there are approximately 1,080 daily passengers who board at the PTC today, which is anticipated to grow to 1,550 by year 2040.

Based on the identified change in service travel times and the elasticities from the October 2015 Northeast Corridor report, daily ridership changes for each alternative were estimated and presented in Table 5-2.

Alternative	Mode	Ridership Change		
		Between Brunswick and Boston	Between Brunswick and Portland	Between Portland and Boston
Alternative 1: Wye Track	Rail	+25	+7	No change
Alternatives 2a, 2b, 4a (Fore River Parkway)	Rail	+50	+17	+1
Alternatives 3a, 3b, 4b (St. John Street)	Rail	+50	+17	+1
Alternative 1: Wye Track	Bus	N/A	N/A	No Change
Alternatives 2a, 2b, 4a (Fore River Parkway)	Bus	N/A	N/A	-10
Alternatives 3a, 3b, 4b (St. John Street)	Bus	N/A	N/A	-30

Table 5-2: Daily Change in Ridership by Mode and Alternative

For the analysis of parking demand, it was assumed that all passenger trip increases that result from relocation to the mainline site are new trips to the NNEPRA system. All were assumed to previously have been a drive trip to the ultimate destination. This assumption maximizes the estimated reductions in VMT and VHT for the alternatives.

5.5 Station Mode of Access

Determining customer station mode of access and parking demand for each alternative is a key element in the overall PTC Study. Mode of access identifies how passengers arrive at the station, both currently and in the future, and these values are necessary to determine future parking demand, which is a significant cost element in each alternative, especially if a parking structure is required. Future year station mode of access and parking demand assumptions and estimates are detailed for each alternative.

Using visual and customer intercept survey data presented in Chapter 3 as a basis, the current and future mode of access distributions for all passengers arriving at PTC for a trip to points south on either NNEPRA, CCL, or Greyhound service were estimated (Table 5-3).

Mode of Access for PTC Passengers	Current Year – Existing PTC Location	Year 2040 – Existing PTC Location	Year 2040 – Fore River /St. John Street Locations
Parked Vehicle On-Site	41%	35%	34%
Drop-Off	55%	57%	56%
Local Bus	2%	6%	6%
Walk	1%	1%	2%
Bicycle	<1%	<1%	2%
Totals	100%	100%	100%

Table 5-3: Current and Future Year Station Mode of Access

To estimate future mode of access values, it was assumed that expanded METRO service will be provided by Year 2040. This assumption increases the percentage of passengers arriving at the station via local transit to approximately six percent – a three-fold increase from the current value. Six percent is an optimal level of local transit for regions of similar size and density. The result is an estimated 60-80 future passengers arriving daily via local transit.

The Fore River Parkway (Alternatives 2 and 4a) and St. John Street (Alternatives 3 and 4b) sites would place a station closer to downtown Portland and other Portland Peninsula destinations, increasing the number of walk and bicycle trips as a mode of access. For trips originating in Portland, the percentage arriving by walk and bicycle is assumed to increase to four percent from a current value of less than two percent. Total walk and bicycle trips to the Fore River Parkway and St. John Street sites are forecast to be in the range of 50 to 55 trips daily.

The current mode of access distribution at PTC is roughly 4 percent of all passengers arriving as a pedestrian, bicyclist, or local transit patron. With the assumed provision of additional transit service and the potential for a station located closer to downtown Portland as described above, the percentage of passengers arriving as a pedestrian, on a bicycle, or on local transit is forecast to double or more - between 8 and 10 percent. This results in approximately 90 percent of passengers destined to points south from Portland arriving at the station in a personal passenger vehicle – either being dropped off/picked up or parking.

5.6 Parking Demand

As stated previously, estimating future parking demand is important for both identifying viable station locations with adequate space for parking and capitol cost estimates to provide the necessary number of parking spaces to meet demand.

The current parking supply at PTC consists of:

- North Lot that provides 371 parking spaces
- South Lot that provides 289 parking spaces
- Overflow Lot on Thompson's Point that provides as many as 300 parking spaces

Combined parking for the north and south lots is 660 spaces. An additional 67 parked vehicles can be accommodated along the North and South Lot curbs in unmarked spaces during peak demand periods. CCL is currently in the process of expanding the south lot, which will provide approximately 560 spaces when completed. This additional south lot capacity has been incorporated into the parking demand estimates.

Current parking demand estimates presented in a 2018 MaineDOT study⁸ indicate that parking demand exceeds the base parking supply of 660 vehicles during approximately 11 weeks of the year. During those periods, overflow parking and on-site curb space is used. The ultimate capacity (consisting of base plus all overflow parking) of 1,027 spaces is reached about one week per year.

Typical parking demand planning does not support providing spaces for all vehicles at the highest day or week of demand. Rather, consistent with standard roadway and intersection capacity practices, parking demand would be based on a time period that would accommodate most, but not all parking demand. This means the number of parking spaces should never be equal to the highest parking demand. Table 5-4 presents estimated Year 2040 peak parking demand associated with a Portland multi-modal transportation center for rail and intercity bus service. The #5 Rank Week numbers were used to forecast parking demand in the Phase 1 alternative analysis. All passenger volume, station mode of access, and parking demand values estimated were then used to conduct the alternative evaluation described in Section 5.6.

⁸ Portland Transportation Center Parking Facility Study: Preliminary Financial Analysis prepared for MaineDOT by AECOM, February 26, 2018

Alternative	#1 Rank Week			#5 Rank Week			#10 Rank Week		
	Total	Long-Term	Short-Term	Total	Long-Term	Short-Term	Total	Long-Term	Short-Term
Alternative 1: Wye Track	1,365	1,065	300	1,215	945	270	1,140	875	265
Alternatives 2a and 2b: Fore River Pkwy	1,295	1,055	240	1,150	940	210	1,070	865	205
Alternatives 3a and 3b: St John Street	1,270	1,035	235	1,130	920	210	1,050	850	200
Alternatives 4a and 4b									
Existing PTC station: CCL & Greyhound pkg	1,155	940	215	1,035	835	200	950	760	190
Proposed Rail station: Downeaster parking	305	185	120	285	175	110	230	140	90

Table 5-4: Year 2040 Peak Parking Demand – Ranked by Week

Alternatives 4a and 4b will require the greatest amount of parking under a bifurcated scenario. Alternatives 1-3 are similar in parking demand, with Alternative 3 resulting in the lowest demand due to increased rail ridership and walk, bicycle, and transit riders, which reduces parking demand slightly.

5.7 Alternatives Evaluation

Each of the alternatives were evaluated based on measure of effectiveness (MOEs) criteria identified in collaboration with the Principal Stakeholders specifically for this Study. The MOEs are organized into 11 categories.

1. Safety – how the proposed alternative affects customer and modal safety
2. Mobility – how the proposed alternative affects vehicular and non-vehicular mobility, including change in ridership
3. Environmental – how the proposed alternative affects greenhouse gas emissions as it relates to the change in travel distance and travel time
4. Efficiency – how the proposed alternative affects the travel time for bus and rail passengers
5. Customer Accessibility – how the proposed alternative affects customer accessibility which includes access to parking, transit, destinations, and modal connectivity
6. Economic/Community Development/Future Vision – how the proposed alternative aligns with current economic/community development opportunities, and future operator and municipal visions
7. Parking – whether the proposed alternative provides adequate parking and how
8. Costs – comparing capital, operation, and maintenance costs of the proposed alternatives
9. Funding – whether there is a viable funding stream for an alternative

10. Mission – whether the proposed alternative is consistent with the mission of the various stakeholders
11. Benefit/Cost – what the range of benefit to cost ratios is for each of the proposed alternatives

Evaluation of the proposed alternatives for each of the MOEs is described below. The MOE matrix shown in Table 5-5 uses color-coding to visually compare the MOE findings.

Safety

- *Reduction in traffic due to increased ridership*

The No Build alternative does not change the mode of access to the transportation center nor shift traffic from the auto mode to the rail or bus mode for intercity travel. With no reduction in local and regional traffic, there is no resulting improvement in traffic safety. Other alternatives decrease rail travel time and result in either equivalent or slightly increased bus travel time, increasing rail travel competitiveness and translating to increased rail ridership through shift from the bus and/or auto mode. Alternatives 2A/B and 3A/B reduce rail travel time more significantly than Alternatives 1, 4A or 4B. The mode shift from bus or auto to rail results in increased safety for passengers because accidents per passenger mile of travel on rail mode is lower than that of bus mode. However, any shift from the auto mode to the rail mode is associated with increased traffic to and from the existing PTC, which adds to any locally existing conflicts.

- *Pedestrian, bicycle and vehicle safety*

As with traffic safety, the No Build alternative does not reduce roadway traffic, locally or regionally and so does not address conflicts that arise between pedestrian and bicycle traffic and vehicles. While Alternative 1 reduces roadway traffic regionally as improved rail travel times induce some shift from auto to rail mode, locally increased auto traffic associated with additional passengers to and from the existing PTC will add to any existing multimodal conflicts. Alternatives 2A/B and 3A/B are closer to the city center and so better connected with pedestrian and bicycle amenities. Connections to this site, though not direct, avoid highway on/off ramps, which enhances safety. As with Alternative 1, increased conflicts with the pedestrians and bicyclists can be expected due to an increased number of vehicles accessing the transportation center due to the modal shift from auto to rail. Under Alternatives 4A/B, pedestrians and bicyclists must navigate two different locations to access the two different modes of public transit. While the safety conditions of pedestrians and bicyclists accessing the bus mode would not change, the Fore River Parkway site for rail is close to bicycle trails, albeit indirectly connected. The shift from the auto mode to the train for intercity travel and potential increase in the nonmotorized access to the train station increases local and regional safety under these alternatives. In general, a consolidated transportation center lends itself to designation of priority transportation corridors for access and egress, enhancing travel safety for all modes. In addition, safety for pedestrians, bicyclists and vehicles can occur exclusively through planned improvements and design as well as traffic engineering controls.

MOE	No Build: Thompson's Point	Alternative 1: Existing Location for Bus/Rail with Wye Track	Alternative 2A: New Location on Fore River Parkway- All Parking	Alternative 2B: New Location on Fore River Parkway- Short Term Parking	Alternative 3A: New Location on St. John Street- All Parking	Alternative 3B: New Location on St. John Street- Short Term Parking	Alternative 4A: Existing Location for Bus, New Rail Station at Fore River Parkway	Alternative 4B: Existing Location for Bus, New Rail Station at St. John Street
Safety								
Reduction in traffic due to increased ridership	No reduction	Reduction	Minor reduction	Moderate reduction	Minor reduction	Reduction	Reduction	Minor reduction
Pedestrian, bicycle, and vehicle safety	No improvement	Minor improvement	Improved	Improved	Improved	Improved	Improved	Minor improvement
Train Movement Safety	Conflicts	Improved	Improved	Improved	Improved	Improved	Improved	Improved
Mobility								
Change in VMT/VHT	No change	Limited reduction	Limited reduction	Limited reduction	Limited reduction	Limited reduction	Limited reduction	Limited reduction
Change in pedestrian and bicycle trips	No change	No change	Minor increase	Minor increase	Increase	Increase	Minor increase	Minor increase
Change in walking/bicycle distance to downtown	No change	No change	No change	Minor decrease	Decrease	Decrease	No change	No change
Environmental								
Reduction in greenhouse gases/vehicle emissions	No change	Decrease	Decrease	Decrease	Limited decrease	Limited decrease	Decrease	Decrease
Customer Efficiency								
Approximate change in travel time by location for bus	No change	No change	Minor increase	Minor increase	Increase	Increase	No change	No change
Approximate change in travel time by location for rail	No change	Minor decrease	Decrease	Decrease	Decrease	Decrease	Minor decrease	Minor decrease
Customer Connectivity								
Change in bus ridership	No change	No change	Limited decrease	Limited decrease	Decrease	Decrease	No change	No change
Change in rail ridership	No change	Minor increase	Moderate increase	Increase	Increase	Increase	Increase	Increase
Modal connectivity	Connected	Connected	Connected	Connected	Connected	Connected	Not connected	Not connected
Access to parking	No change	Full access	Short and long-term access	Short term only	Short and long-term access	Short term only	Short and long-term access	Short and long-term access
Access to transit	No change	No change	No current connection	No current connection	Adjacent routes exist	Adjacent routes exist	No current connection	Adjacent routes exist
Access to pedestrian and bicycle networks	Adjacent	Adjacent	Adjacent	Adjacent	Not adjacent	Not adjacent	Adjacent	Only bus station adjacent
Customer connections for last mile shuttle and local shuttle	Connected	Connected	Transit stop, parking shuttle required	Transit stop, parking shuttle required	Transit stop, parking shuttle required	Transit stop, parking shuttle required	Two transit stops required	Two transit stops required
Equity assessments	No improvement	No improvement	Minor improvement	Minor improvement	Minor improvement	Minor improvement	Minor improvement	Minor improvement
Economic/ Community Development/ Future Vision								
Compatibility with existing land use	Compatible	Compatible	Not compatible	Not compatible	Partly compatible	Partly compatible	Not compatible	Partly compatible
Consistency with comprehensive/ master plan	Consistent	Consistent	Not consistent	Not consistent	Partly consistent	Partly consistent	Not consistent	Partly consistent
Development potential	Local only	Local only	Moderately supportive	Moderately supportive	Supportive	Supportive	Not supportive	Not supportive
Consistency with future transportation vision	Not consistent	Moderately consistent	Consistent	Consistent	Consistent	Consistent	Not consistent	Not consistent
Parking								
Meets parking demand in 2040 on/nearby site	All parking on/nearby site	All parking on/nearby site	Short and long-term parking	Short term parking only	Short and long-term parking	Short term parking only	Short and long-term parking	Short and long-term parking
Requires parking structure/potential parking pricing effect	None required	Requires limited structure	Requires large structure	Requires limited structure	Required	Requires limited structure	Requires limited structure	Requires limited structure
Potential for short/long term parking	Potential/location TBD	Potential/location TBD	Potential/location TBD	Potential/location TBD	Potential/location TBD	Potential/location TBD	Potential/location TBD	Potential/location TBD
Costs								
Estimated Conceptual Capital Costs (2019 \$\$)	\$4.6M	\$28.6M	\$64.7M	\$44.7M	\$62.7M	\$45.90M	\$40.1M	\$41.5M
Estimated Annual Operations and Maintenance Cost difference from No-Build Alternative	\$ -	-\$73,000	-\$17,000	\$133,000	\$28,000	\$133,000	\$216,000	\$206,000
Transportation Infrastructure Needs	No/Limited Needs	Wye track, station, and rail improvements required	Mainline rail improvements, limited roadway improvements required	Mainline rail improvements, limited roadway improvements required	Mainline rail improvements, more significant roadway improvements required	Mainline rail improvements, more significant roadway improvements required	Mainline rail improvements required	Mainline rail improvements, more significant roadway improvements required
Funding								
Funding availability	CCL funding identified for parking	CCL funding identified for station improvements; no funding for Wye track	No funding identified	No funding identified	No funding identified	No funding identified	CCL funding identified for station; no funding identified for rail	CCL funding identified for station; no funding identified for rail
Potential for federal, state, municipal, and private funding	Private (CCL) available	Private available for station; possible state/federal for Wye track	Private available for station; possible state/federal for Wye track; sizable parking funding need	Private available for station; possible state/federal for Wye track; some parking funding need	Private available for station; possible state/federal for Wye track; sizable parking funding need	Private available for station; possible state/federal for Wye track; some parking funding need	Private available for station; possible state/federal for Wye track; some parking funding need	Private available for station; possible state/federal for Wye track; some parking funding need
Mission								
Consistent with CCL Business Plan	Consistent	Consistent	Partly consistent	Inconsistent	Partly consistent	Inconsistent	Consistent	Consistent
Consistent with NNEPRA Mission	Inconsistent	Partly consistent	Consistent	Consistent	Consistent	Consistent	Consistent	Consistent
Consistent with City of Portland Plan	Consistent	Consistent	Inconsistent	Inconsistent	Partly consistent	Partly consistent	Partly consistent	Partly consistent
Consistent with METRO Mission	Partly consistent	Partly consistent	Partly consistent	Partly consistent	Partly consistent	Partly consistent	Partly consistent	Partly consistent
Benefit/Cost assessment	N/A	0.86	0.65	0.87	0.57	0.73	0.94	0.92

- Notes and Assumptions**
1. Assumes that overflow parking (approximately 300 spaces) remain in the future for selected alternatives
 2. Where two different ratings occur in the same alternative, color is defaulted to the lower rating.
 3. For Alternative 1, no change in time assumed for Portland-Boston rail trips, 9 minute savings (estimated) for trips to/from Brunswick
 4. For Alternatives 2-4, a one minute decrease assumed for Portland-Boston rail trips, 10-16 minutes savings for trips to/from Brunswick to Portland/Boston respectively
 5. No overflow parking for rail at either site. Overflow at bus site provided.
 6. A benefit/cost ratio of 1.0 or greater is considered positive

Please note - colors for each of the MOE's are used to identify differences only and should not be interpreted as fatal flaws in each alternative. MOE results are best viewed collectively to understand a full picture.

- *Train Safety*
The No Build alternative does not result in any change in train operations and so no change to safety aspects related to train movements. Construction of the wye track associated with Alternative 1 eliminates the back-up movements by the train and additional conflicting movements, thereby improving train movement safety. All other alternatives provide the opportunity to enhance safety of train movements through location and design of a new rail facility.

Mobility

- *Change in VMT/VHT*
With no shift in mode of access, the No Build alternative does not shift local or regional auto traffic to public transportation, thereby resulting in no reduction in VMT/VHT. Enhanced rail service associated with all other alternatives attracts a limited number of new passengers from both bus and auto modes. Any shift from the auto mode would reduce regional VMT and VHT but would also increase local VMT/VHT associated with auto access to the transportation site. Any mode shift from the bus to the rail would not lead to any reduction in VMT/VHT, either locally or regionally.
- *Change in pedestrian and bicycle trips*
With no provision for any added pedestrian and bicycle amenities connecting the transportation center to other areas, or changes in the bus or rail operations that result in increased ridership, the No Build and Alternative 1 do not change the number of trips to and from the transportation center. Increased proximity to the city center and better amenities provided in Alternatives 2A/B and 3A/B increases the number of bicycle and pedestrian trips by 10 to 20 pedestrian/bicycle trips daily as compared to the current location. Under Alternatives 4A/B, the bus service would continue to operate out of the current location for the PTC and there will be no changes to the bicycle and pedestrian facilities and hence there will be no changes to the pedestrian and bicycle trips. The rail station being closer to the city center and having better amenities will marginally increase the number of bicycle and pedestrian trips to this node (Table 5-3).
- *Change in walking/bicycle distance to downtown*
With the PTC remaining at its current location, there is no change in the walking/bicycling distance between the transportation center and downtown and other destinations under either the No Build Alternative or Alternative 1. Walking distance from downtown to the Alternatives 2A/B location is almost equal to that of the current location because there is no direct route from the west side of the rail tracks to downtown. Bicycling distance to downtown is closer because the Fore River Parkway Trail can be accessed close to the site. Of the three locations, Alternatives 3A/B offer the greatest proximity to downtown via the Fore River Parkway Trail and the city grid. Even though there are no pedestrian amenities connecting the site to the east directly, connection to the city grid is occurs via St. John and Congress Streets. Alternatives 4A/B result in no change in the walking or bicycling distance between the current PTC location to any other destination. The rail station at Fore River

Parkway is closer by bicycle, whereas the pedestrian connection to other destinations is almost the same as that of the current PTC because there is no direct connection from the Fore River Parkway site to the city's pedestrian grid.

Environmental

- *Reduction in greenhouse gases/vehicle emissions*

No change in existing levels of vehicle emissions will result from implementing the No Build alternative or Alternative 1. Any decrease in passenger vehicle travel associated with the remaining alternatives is presumed to also reduce greenhouse gas/ vehicle emissions; however, this decrease is likely minimal enough to be offset by even a slight increase in local transit offerings accessing alternate station locations.

Efficiency

- *Approximate change in travel time by location for bus*

No build, Alternative 1, and Alternatives 4A/B propose no change in the location of the transportation center nor any engineering controls to speed up the bus travel, hence there is no change in the bus travel time with any of these options. The Alternative 2A/B site is located slightly farther away from the highways, hence the travel distance associated with bus travel increases marginally by about a minute. Alternative 3A/B are the farthest from the highways and increase the bus travel time by approximately 3 minutes.

- *Approximate change in travel time by location for rail*

Because there is no change in the location of the rail station with the No Build alternative, and no service modifications or changes to rail infrastructure, there is no change to the travel time by rail. Construction of the wye track proposed for Alternative 1 streamlines access and egress of the train from the current station and reduces the number of necessary movements. This translates to travel time savings between 0 and 9 minutes, depending on the origin destination pair, overall increasing rail travel efficiency. For the remaining alternatives, moving the rail station to the main line reduces the rail travel time by rail anywhere between 1 to 16 minutes, based on the service and origin and destination.

Customer Accessibility and Availability

- *Change in bus ridership*

With no change to any aspect of bus service or change in location of the terminal point or accessibility, the No Build alternative does not change bus travel time or any amenities, hence there is no change to bus ridership. Because Alternative 1 improves the rail transit time, the bus ridership reduces marginally reflecting the mode shift from bus to rail. Reduction in bus ridership is expected to be up to 10 trips daily under Alternatives 2A/B due to an increase in bus travel time. Alternatives 3A/B result in a mode shift from the bus to other modes and the ridership declines by up to 30 trips daily. Though Alternatives 4A/B retain the bus service at its current location without any change in its operational characteristics, these alternatives reduce the bus ridership in the range of 35-50 trips daily, reflecting the increased competitiveness of the rail mode.

- *Change in rail ridership*
 With no change to any aspect of rail service or change in location of station, accessibility or any rail related infrastructure, there is no change in rail travel time or any amenities with the No Build alternative, hence there is no change to rail ridership. Introducing the wye track as part of Alternative 1 reduces rail transit time, making the rail mode more competitive against other modes of intercity travel namely, bus and auto. This results in a mode shift from both modes to the rail, thereby increasing the number of passengers using the rail mode for intercity travel by an estimated 30-35 trips per day. The reduction in rail travel time for all other alternatives can be significant; an up to 16- minute reduction translates to an increased ridership of about 65-70 trips per day.
- *Value of connectivity*
 Because both modes of intercity travel area located at the same node at the existing PTC, all except Alternatives 4A/B offer passengers the modal choice and the choice of connecting from one mode to the other. With the two public transit modes being separated in Alternatives 4A/B, passenger choice to select either of the modes or transfer from one mode to the other is severely compromised.
- *Access to parking*
 The existing PTC offers passengers the convenience of short-term, long term as well as overflow parking, all at or immediately adjacent to the site. Alternatives 2A and 3A offer passengers the convenience of short-term and long-term parking, while Alternatives 2B and 3B offer only short-term parking. Long term parking is accommodated at a yet to be determined site and a last mile shuttle provides connection between the site and long-term parking lot. There is adequate short- and long-term parking at both Alternative 4A and 4B; overflow parking is available at the Fore River Parkway Site.
- *Access to transit*
 The existing site is served by only two routes: Route 1 of the METRO and the METRO BREEZ Express Service between Portland, Yarmouth, Freeport, and Brunswick. No Build and Alternative 1 do not change the provision of transit service at this location. Alternatives 2A/B is not served directly by local transit; however, Route 1 plies on Fore River Parkway and service can be modified to add a transit stop at this location. The Alternative 3A/B site is not served directly by local transit, rather Route 1 and the BREEZ express service plie on St. John Street; therefore, service can be modified to add a transit stop at this location. As with Alternatives 3A/B, the Fore River Parkway site proposed in Alternatives 4A/B is not served by the any transit, but the operations of Route 1 service, which plies on Fore River Parkway, can be modified to add a stop at this location.
- *Access to pedestrian and bicycle networks*
 Challenges posed by the geographical distance of the existing PTC from downtown and the need to negotiate the on and off ramps that lead to and from the local roads to the

surrounding highways will not be addressed by the No Build alternative or Alternative 1. The Fore River Parkway Trail, which can be used by both pedestrians and bicyclists, is in close proximity and can be accessed fairly easily in all alternatives but for Alternatives 2A/B, connection to the greater pedestrian network is not direct on the west side of the tracks. East of the tracks there is pedestrian connectivity along St. Johns Street, though only in the north-south direction. For Alternatives 3A/B, connection to the greater pedestrian network is through the combination of St. John Street and Congress Street; however, there is no direct eastward connection to the street network east of Valley Street. Alternatives 4A/B provide access to both pedestrian and bicycle networks; the Fore River Parkway Trail can be accessed easily at the intersection of St. John Street and Danforth Street and pedestrians can use the trail or connect to the city's main grid at the intersection of St. John Street and Congress Street.

- *Customer connections for last mile shuttle and local shuttle*

The existing site is served by one transit stop and the presence of requisite on-site parking as well as an overflow lot in the immediate vicinity, therefore the No Build alternative and Alternative 1 eliminate the need for shuttle connections. Because both modes are collocated in Alternatives 2A/B and 3A/B, only one transit stop is required to serve the last mile shuttle or the shuttle connecting the site to the overflow parking lot. Alternative 4A/B will require two different transit stops serviced by the local transit for the two different locations for the two modes of transportation.

- *Equity assessments*

The current location of the PTC site does not lend itself to strong pedestrian, bicycle and transit connections; auto is the primary mode of access. Under the No Build alternative and Alternative 1, there is no change to the primary mode of site access and so no improvements to equity. The geographic location of Alternatives 2A/B moves the center closer to the urban core and provides increased choice of transportation to and from the site, leading to minor improvement in the equity issue related to locational choice. Amongst the three sites being evaluated, the geographical location of Alternatives 3A/B move it closest to the urban core and also provide increased choice of transportation to and from the site, resulting in the most improvement in the equity issue related to the locational choice of the transportation center. Alternatives 4A/B lead to nominal improvement to equity because only one of the transportation modes moves closer to downtown and in the process becomes more accessible to all modes of transportation.

Economic/ Community Development/Future Vision

- *Compatibility with existing land use*

No Build and Alternative 1 result in no change to the existing transportation and transportation related land uses. The current land use around the Alternatives 2A/B location is medical/ hospital use and large-scale transportation use bringing together bus, rail and a large parking facility is not consistent with the existing usage. In Alternatives 3A/B, the east

side of the rail tracks already has mixed use development and the development of a transportation center will be aligned with the expansion of the mixed-use land use. The transportation center could be envisioned as a strong anchor for cohesive future mixed-use development. Alternative 4A continues the transportation land use at the existing site with no change. However, the new rail station location for Alternative 4A is currently for medical/hospital use and a transportation facility is not consistent with the existing usage. To the contrary, the new station location envisioned in Alternative 4B is mixed use in nature and a transportation center is not in conflict with the mixed use.

- *Compatibility with comprehensive/master plan*

Thompson's Point is in the B-5 zoning district, which allows for a wide range of commercial and mixed uses and envisions urban patterns of development; therefore, the No Build alternative is consistent with the long-range plans for Thompson's Point. The PTC is relatively far from the urban core of the city and the presence of the highway system further acts as a divider between the urban fabric and the transportation center. The PTC is the major intercity public transportation node for the City of Portland and, even though it aligns itself with the long term plans for Thompson's Point, it is expected to be challenging to integrate the center in a meaningful way and for it to contribute to a high level of economic development and downtown revitalization without connecting it to major destinations with very rich local transit connections, which is not envisioned at this stage of the study. The new combined location proposed by Alternatives 2A/B brings together CCL and NNEPRA on the main line tracks but is not consistent with Mercy Hospital's expansion master plan. Similarly, the Fore River Parkway location proposed in Alternative 4A is not consistent with Mercy Hospital's master plan. By comparison, a transportation center proposed in Alternatives 3A/B and 4B does not conflict with any vision statement by the Maine Medical Center or the City of Portland's Long-Range Plans for the vicinity near St. John and Valley Streets.

- *Development potential*

Both the No Build alternative and Alternative 1 have the potential to anchor future development around the PTC but the effect would be more local in nature because the existing site is relatively far from the urban core of the city and the presence of the highway system further acts as a divider between the urban fabric and the transportation center. Bringing together the two modes of transportation at a central location and providing access, parking and connections to and from the Alternative 2A/B sites to parcels of land both east and west of the tracks can support development opportunities around this core. Alternatives 3A/B are in a mixed land use area on the eastside of the tracks, closest to the city grid relatively close to downtown. Local transit runs on St. Johns Street and Congress Street, and parcels of land are available that can be earmarked for future development, providing the foundation for a strong development vision around the transportation center. Alternatives 4A/B lead to the bifurcation of the services, resulting in loss of critical mass and the development of strong anchor that can form the nucleus of future development. While the transportation center at the current location will continue to spur development, it will be

limited in nature, and development around the rail station will probably not occur considering the total ridership and service patterns.

- *Consistency with future transportation vision*

With the transportation center being located away from downtown, the primary mode of access being the auto, and no enhancement of the multi-modal transportation systems, neither the No Build nor Alternative 1 is consistent with the future transportation vision of the greater Portland Area. Alternatives 2A/B and 3A/B increase choice for the end consumer, provide multi-modal connections, induce a shift from the auto mode to a public transit mode, and provide access connectivity through non-auto modes. These aspects are consistent with the future transportation goals for the city for Portland as well as regionally. In Alternatives 4A/B, there will be no change to the current PTC site; it will continue to operate as a center that is served primarily by the auto mode. The improved rail mode will result in some modal shift from auto to rail for regional as well as shorter trips, aligning with the goal of increased multi-modal transportation and reduced auto dependency.

Parking

- *Parking Demand in 2040*

Both the No Build alternative and Alternative 1 will continue to be able to access adequate parking on or nearby the existing PTC site to meet 2040 demand. Alternatives 2A, 3A and 4A/B can accommodate both short and long-term future parking demand but lack adequate access to overflow parking. Alternatives 2B and 3B provide the least parking on site, meeting only short-term capacity needs as estimated for 2040.

- *Requires parking structure/parking price effect*

Only the No Build alternative continues to provide adequate parking on site without employing a parking structure and/or parking price effect. Other alternatives require at least a limited parking structure, with Alternatives 2A and 3A requiring larger, higher capacity structures at significant cost.

- *Potential for short/long term parking*

All alternatives analyzed in Phase 1 of this study have the potential to incorporate short and/or long-term parking with either surface or structure parking spaces.

Costs

- *Estimated Capital Costs*

The No Build alternative includes planned improvements at the existing PTC, which come at the lowest cost of the alternatives studied. Costs of other alternatives are more significant relative to the status quo; however, Alternatives 2A and 3A require higher levels of funding due to the need for larger parking structures to meet 2040 demand.

- *Estimated Annual Operation and Maintenance Cost Difference*

Under the No Build alternative, annual operations and maintenance costs are not likely to vary over the current condition. Alternatives 1 and 2A result in a decrease to these costs, primarily due to efficiencies realized by operational improvements, and Alternatives 2B, 3A and 3B would require a somewhat modest additional annual funding allocation. Of the Phase 1 alternatives, 4A/B require the most significant increase in annual operations and maintenance costs.

- *Transportation Infrastructure Needs*

While the No Build alternative has no associated requirement for additional transportation infrastructure, all other alternatives require at least mainline rail improvements. Specifically, Alternative 1 requires improvements to existing track, station, and rail at the PTC site; Alternatives 2A/B and 4A require mainline rail improvements; and Alternatives 3A/B and 4B require more extensive improvements to roadways in addition to the mainline improvements.

Funding

- *Funding Availability*

CCL has identified funding for the existing PTC site, which will allow for planned improvements to facilities under both the No Build alternative and Alternative 1. Wye track upgrades also proposed as part of Alternative 1 have no identified funding source, which is also true of the remaining Phase 1 alternatives.

- *Potential for Federal, State, Municipal, and Private Funding*

As stated above, private funding for planned improvements to the existing PTC has been committed by CCL. Private funding is also likely available for station facilities associated with other alternatives, along with state and/or federal funding for track improvements. No specific source of state or federal funds has been identified, nor has a source of funds for parking accommodations. In the case of Alternatives 2A and 3A, a sizeable need exists for the latter facilities.

Mission

- *Consistent with CCL Business Plan*

The No Build alternative, Alternative 1 and Alternatives 4A/B are consistent with the CCL Business Plan. While Alternatives 2A and 3A are partly consistent with this plan since access to location is not immediately adjacent to I-295, remaining Alternatives 2B and 3B pose conflicts with the CCL Business Plan as it exists today given the distance from I-295 and additional time and distance for customers to access the location.

- *Consistent with NNEPRA Business Plan*

All Phase 1 Alternatives are wholly consistent with the NNEPRA Business Plan of relocating to the rail mainline to improve rail times and increase ridership except for the No Build

alternative, deemed inconsistent with the NNEPRA Business Plan and Alternative 1, which is only partly consistent due to slight rail time and ridership improvements.

- *Consistent with City of Portland Plan*
Analysis of the alternatives shows that the existing PTC functions comprised within the No Build alternative and Alternative 1 are consistent with the transportation objectives in the City of Portland's Comprehensive Plan. To the contrary, Alternatives 2A/B are inconsistent with the City's Plan. Remaining alternatives meet some, but not all of the objectives and are therefore partly consistent with this comprehensive plan.
- *Consistent with METRO Mission*
All Phase 1 alternatives are partly consistent with the METRO mission in that the alternative locations are on existing METRO transit routes but are served by a limited number of transit routes.

Benefit/Cost Assessment

Cost/benefit analysis was not applied to the No Build alternative as it is considered the baseline for the evaluation. A benefit/cost ration of 1.0 or greater is considered positive. None of the alternatives analyzed in this phase meet this threshold.

5.8 Phase 1 Summary

The Phase I Alternatives Analysis did not identify an alternative that had significant benefits over other alternatives. A summary of the key findings from the Phase I Alternatives Analysis concluded:

- **No-build Alternative.** The No-Build Alternative should be dismissed as it does not address long-term bus and rail customer needs, does not eliminate train movement safety conflict, does not promote additional bus or rail ridership, does not increase walk and bike trips, and does not reduce greenhouse gas emissions.
- **Alternative 1:** Initially, Alternative 1 was identified as improving rail and safety ridership through the implementation of the Wye Track; reduced traffic and VMT/VHT; and decreased greenhouse gas emissions but this alternative did not improve walk and bike trips. Questions were raised by the Principal Stakeholders following presentation of the Phase 1 findings regarding the estimated rail ridership improvements which resulted in reduced traffic, VMT/VHT, and greenhouse gases. Through further evaluation after the Phase 1 analysis, it was determined that no rail ridership time savings would be achieved. As a result, Alternative 1 with the Wye track was eliminated from further consideration.
- **Alternatives 2a and 2b.** Alternatives 2a and 2b should be eliminated from further consideration due to concerns raised by Mercy Hospital regarding conflicts of a potential bus and/or rail station with their campus development plan.
- **Alternatives 3a and 3b.** Initially, Alternatives 3a and 3b were identified as improving rail safety and ridership by locating the station on the rail mainline, slightly reducing traffic,

VMT/VHT and greenhouse gas emissions, increasing walk and bike trips as the station was located closer to downtown Portland. However, decreased bus ridership due to the additional distance and travel time for bus customers, higher capital costs, and uncertainty whether the location was compatible with existing land use and overall area master plans result in recommending that these alternatives be dismissed. Questions were raised by the Principal Stakeholders following presentation of the Phase 1 findings regarding the impacts to bus ridership and the feasibility of the proposed location to accommodate both a bus and rail station and parking. Based on existing site constraints and impacts to bus ridership and operations cited, Alternatives 3a and 3b should be eliminated from further consideration.

- **Alternatives 4a and 4b.** Alternative 4a should be eliminated from further consideration due to concerns raised by Mercy Hospital regarding impacts of a potential bus and/or rail station on their campus development plan; because of these impacts, these alternatives were deemed inconsistent with Mercy's guiding plan. Alternative 4b was identified as improving rail safety and ridership because it locates the station on the rail mainline, has a minor reduction in traffic, VMT/VHT and greenhouse gas emissions, increases walk and bike trips for rail passengers as the station was located closer to downtown Portland. But Alternative 4B also had moderate to high capital costs, increased operations and maintenance costs, impacted bus and rail customer synergy, added an additional transit stop due to the separate bus and rail stations, and there was uncertainty if the location was compatible with existing land use and overall area master plans. Questions were raised by the Principal Stakeholders following presentation of the Phase 1 findings regarding required number of rail parking spaces and the other key assumptions regarding this Alternatives. Based on these questions and the impact the parking spaces had on costs and compatibility, it was determined that key assumptions for Alternative 4b be revisited and the analysis revised in a second phase of the study.

Additionally, during the review of the Phase 1 summary by the Principal Stakeholders, an additional location was identified for consideration. The Union Station site is located at the intersection of Congress Street and St. John Street. Based on the summary from the Phase 1 analysis and discussion with the Principal Stakeholders, MaineDOT decided that a second phase of analysis was warranted. The resulting Phase 2 analysis is described in Chapter 6.

6. Phase 2 Alternatives Analysis

6.1 Phase 2 Objectives

Phase 1 of the Alternatives Analysis highlighted the need for a modified study approach to re-analyze eliminated Phase 1 alternative locations, consider new alternatives, address concerns over initial key assumptions, and increase focus on customer and transportation benefits. These identified needs are addressed in the Phase 2 Alternatives Analysis, which focused on the following objectives.

- Maintaining CCL operations at the existing PTC location on Thompsons Point. Review of the Phase 1 Alternatives Analysis did not yield enough benefit to warrant relocation of CCL from its existing location. This is coupled with CCL's current ownership and operation of the PTC facility and south parking lot, as well as its desire to remain at its current location.
- Continuing evaluation of potential benefits associated with relocating NNEPRA to a separate rail station on the mainline and resulting improvements in transportation and rail safety.
- Re-evaluating the benefits of the Wye track evaluated in previous NNEPRA and MaineDOT studies and the Phase 1 Alternatives Analysis. Based on questions from the Phase 1 findings, and additional evaluation by NNEPRA, MaineDOT and the Study Team, the Wye Track was removed from further analysis prior to beginning the Phase 2 alternatives analysis as it was determined to not provide any additional rail travel time benefits.
- Completing a more detailed evaluation of bus and rail parking and operation requirements. Additional data provided following the Phase 1 analysis supported the need to reevaluate bus and rail parking demands as well as combined and separated facility operation requirements.
- Continuing focus on customer efficiency, modal connections, and mobility. The overarching Study Purpose to focus on customer needs and transportation benefits remains in the Phase 2 alternatives analysis. A more focused evaluation process and MOE matrix improves the broader approach taken in Phase 1.

6.2 Identified Alternatives

Using the Phase 2 objectives identified above, the following four alternatives were evaluated as part of the Phase 2 alternatives analysis. Phase 2 alternatives were numbered sequentially to the Phase 1 alternatives.

- **No-build Alternative:** Existing PTC Location on Thompson's Point for bus and rail with only planned and funded improvements
- **Alternative 5:** Existing PTC Location on Thompson's Point for bus and rail with additional improvements to meet parking and customer needs

- **Alternative 6:** Existing PTC Location on Thompson’s Point for bus in its existing location on north side of tracks and rail on south side of tracks with additional improvements to meet parking and customer needs
- **Alternative 7:** Existing PTC Location on Thompson’s Point for bus and Ferguson Property area on St. John Street for rail
- **Alternative 8:** Existing PTC Location on Thompson’s Point for bus and Union Station area adjacent to Congress Street for rail

For each alternative, a conceptual layout was developed identifying how each location could accommodate the required parking, station, access, pick-up and drop-off areas, and rail platform and track infrastructure required (Figures 6-1 through 6-4). Alternatives 6, 7 and 8 concept layouts do not show the bus layout as it is assumed to be the same as shown on Alternative 5. The conceptual layouts represent a limited engineering evaluation of each location. Any alternative advancing from this Study will require a more detailed engineering and cost evaluation.

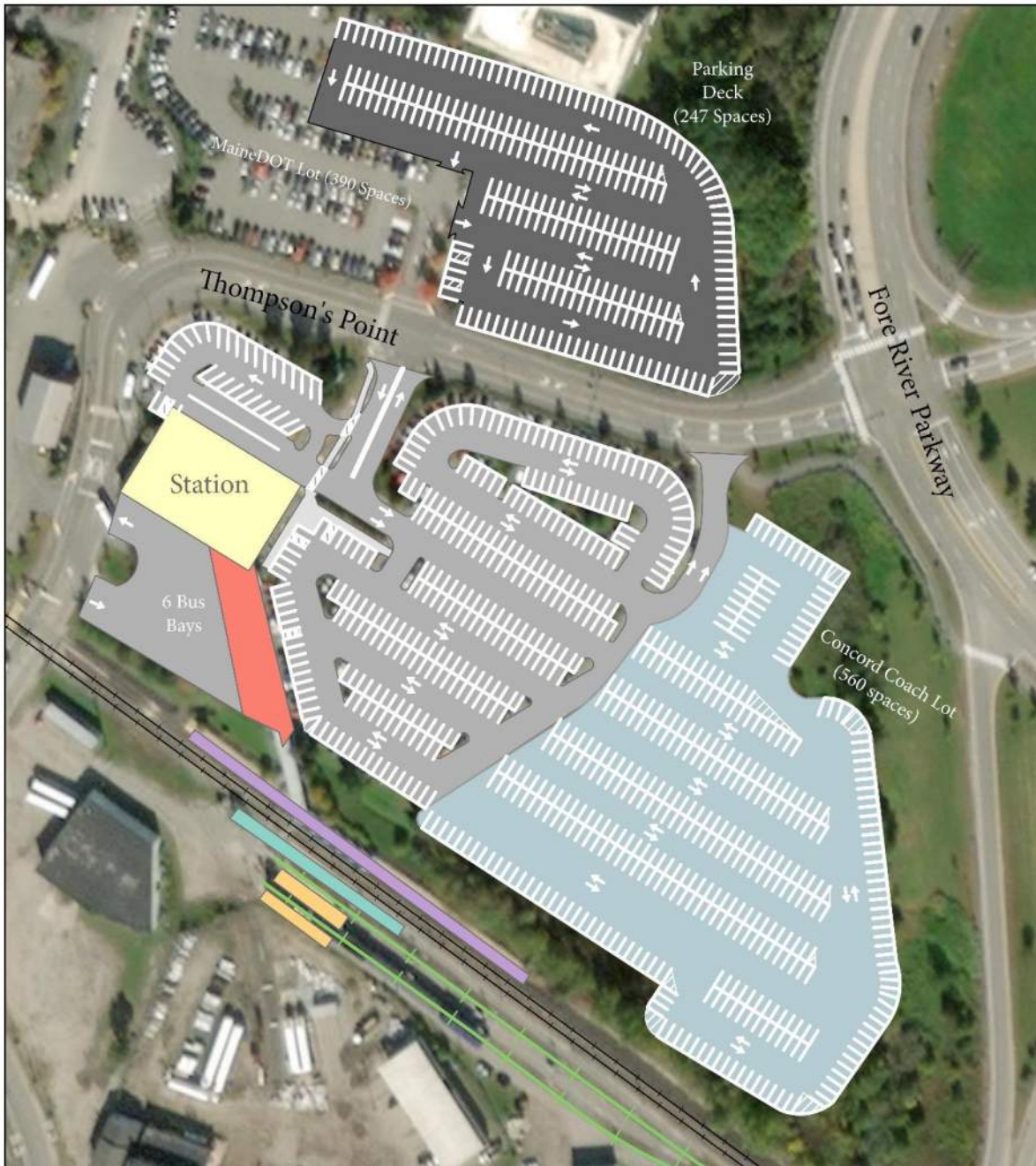
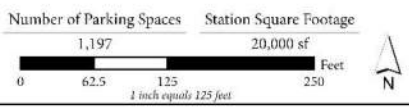


Figure 6-1
Alternative 5

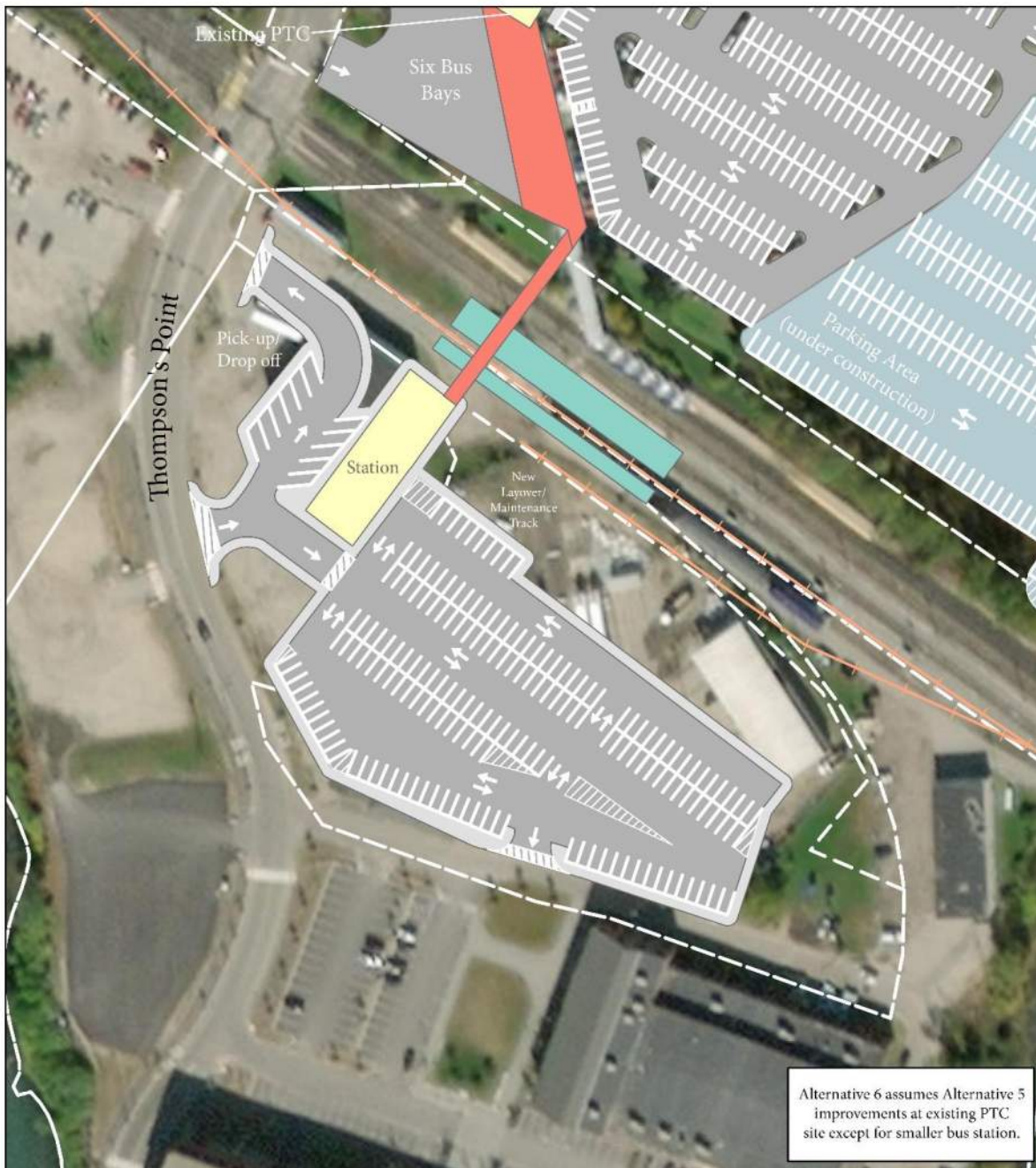
Existing PTC
(Bus & Rail Station)

- New Station
- Parking Area (under construction)
- Existing Parking Area
- Sidewalk
- New Parking Deck
- New Platform
- Existing Platform
- Pedestrian Walkway
- Existing Concrete Pad
- Existing Passenger Rail
- Existing Layover/Maintenance Tracks





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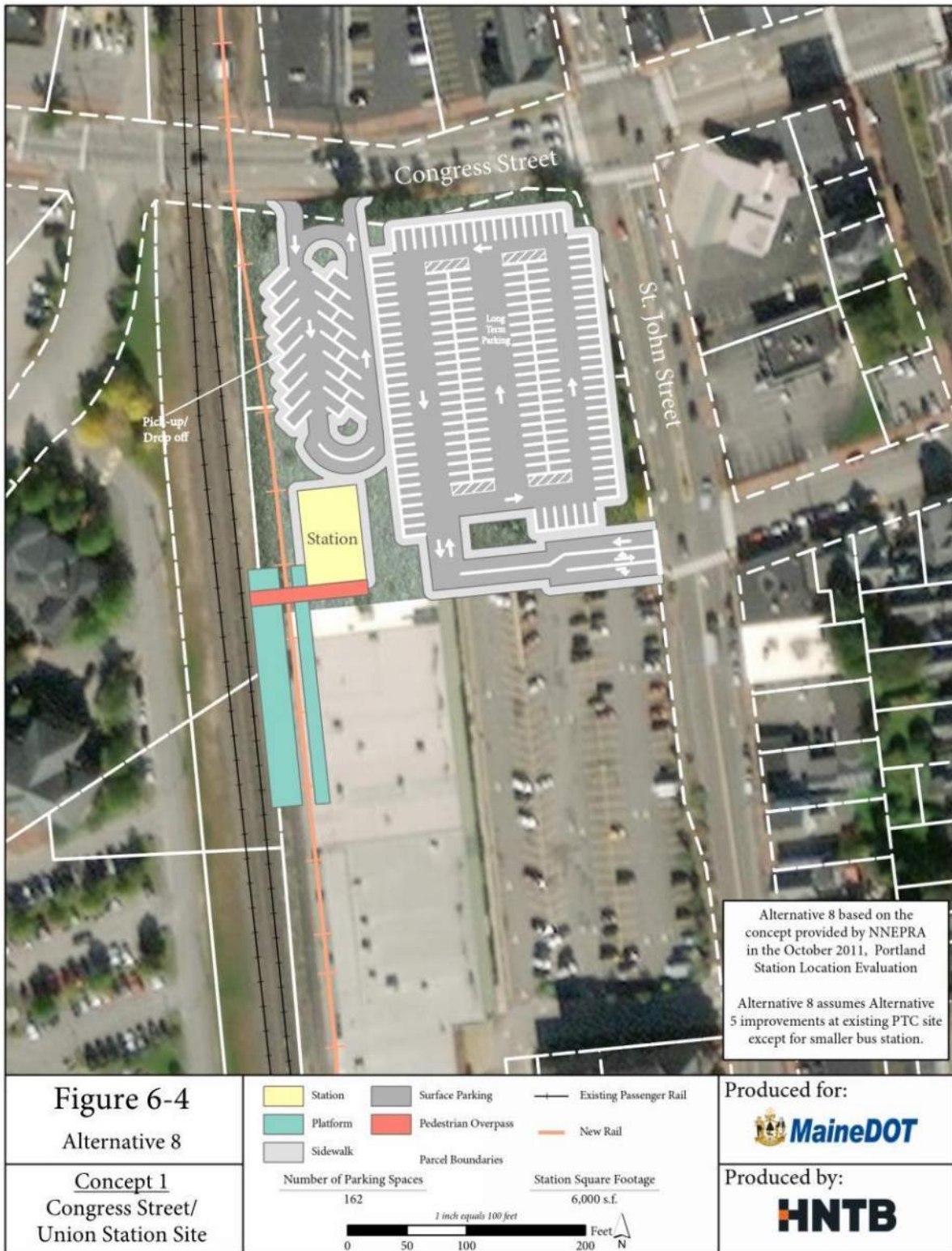
Alternative 6 assumes Alternative 5 improvements at existing PTC site except for smaller bus station.

<p>Figure 6-2 Alternative 6</p> <p>South of Existing PTC</p>	<p> Parking Lot Sidewalk Parcel Boundaries Pedestrian Overpass Platform New Rail Station </p>	<p>Produced for:</p> 
	<p> Number of Parking Spaces: 162 Station Square Footage: 6,000 s.f. 1 inch equals 100 feet Feet 0 50 100 200 N </p>	<p>Produced by:</p> 

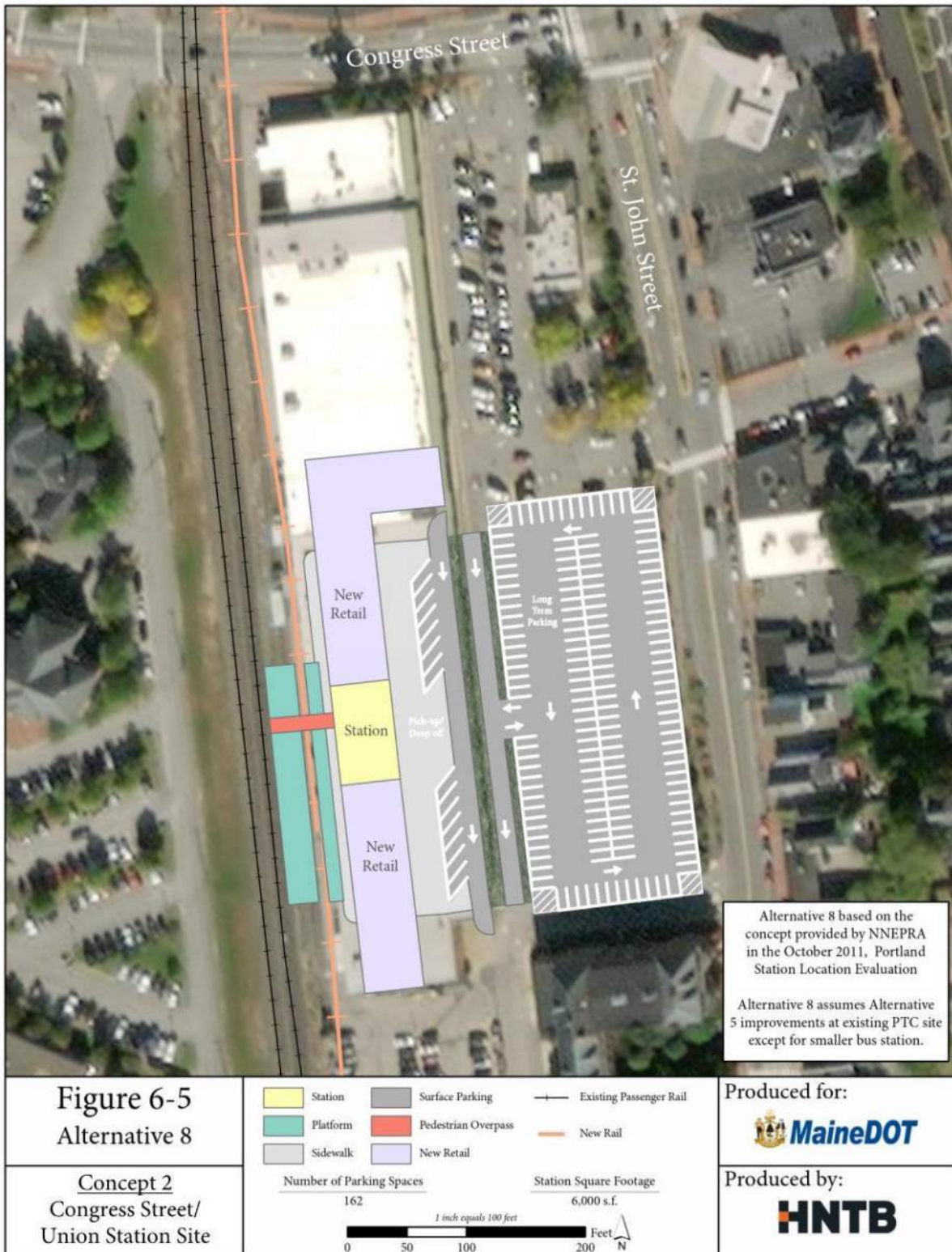
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6.3 Estimated Change in Passenger Ridership

Changes in passenger ridership can be anticipated if a change in the location of the bus and/or rail station results in a change in operating travel times for NNEPRA, CCL, or Greyhound. This change in operating times can be either a benefit or detriment to ridership. Using previous NNEPRA study data for rail operating time changes, updated Wye track evaluation findings that identified no operating time benefit, and PTC Study travel time runs, the anticipated changes in bus and rail service travel times for the locations associated with Alternatives 5 through 8 were evaluated (Table 6-1).

Alternative	Mode	Travel Time Change		
		Between Brunswick and Boston	Between Brunswick and Portland	Between Portland and Boston
Alternatives 5 and 6: Existing PTC Location	Bus and Rail	No Change	No Change	No Change
Alternatives 7 and 8: St. John Street/Union Station	Bus	-	-	No Change
Alternative 7: St. John Street Rail Station	Rail	-16 minutes	-10 minutes	-1 minute
Alternative 8: Union Station Rail Station	Rail	-16 minutes	-10 minutes	-1 minute

Table 6-1: Change in Service Travel Times by Mode and Alternative

Using the same ridership elasticities from the Phase 1 analysis resulted in a 0.65 percent change in ridership for every 1 percent change in travel time for commuter/business trips, and a 1.2 percent change in ridership for every 1 percent change in travel time for all other trips.

Comments provided by the Principal Stakeholders from the Phase 1 analysis findings indicated that different growth rates for bus and rail passengers would be appropriate for the Phase 2 analysis. Using updated data provided, passenger volumes in the 20-year forecast timeframe are assumed to grow beyond current values as follows.

- For all passenger boardings on CCL and Greyhound service departing from Portland, an annual growth rate of 2.2 percent⁹ is assumed (i.e., Year 2040 boardings are 44 percent above current values).
- For all NNEPRA passenger boardings at the Freeport and Brunswick stations, the annual growth rate of 2.2 percent is also assumed.

⁹ The Portland Transportation Center Parking Facility Study, prepared for MaineDOT by AECOM in February 2018, presents a base growth scenario that has a 20-year annual growth rate of 2.2 percent for PTC passengers.

- NNEPRA boarding data for at the existing PTC station between the years 2007 and 2019 demonstrate little growth in ridership. In consultation and coordination with NNEPRA staff, an annual growth rate of 1 percent was determined to be an appropriate estimate.

The updated analysis shows that there are approximately 1,080 daily passengers who board at the PTC today, which is anticipated to grow to 1,478 by year 2040. This value is slightly below the 1,553 daily passengers identified in the Phase 1 analysis findings.

Based on the change in service travel times and the elasticities from the October 2015 Northeast Corridor report¹⁰, daily ridership changes for each alternative were estimated (Table 6-2).

Alternative	Mode	Ridership Change		
		Between Brunswick and Boston	Between Brunswick and Portland	Between Portland and Boston
Alternatives 5-8	Bus	N/A	N/A	No change
Alternatives 5 and 6: Exiting PTC location	Rail	No change	No change	No change
Alternatives 7 and 8: St. John Street/Union Station	Rail	+42	+10	+6

Table 6-2: Daily Change in Ridership by Mode and Alternative

For the analysis of parking demand, it was assumed that all passenger trip increases resulting from relocation to the mainline site are new trips to the NNEPRA system; all were assumed to previously have been a drive trip to the ultimate destination. This assumption maximizes the estimated reductions in VMT and VHT for the alternatives.

6.4 Station Mode of Access

Determining customer station mode of access and parking demand for each alternative is a key element in the overall PTC Study. Mode of access identifies how passengers arrive at the station, both currently and in the future, and these values are necessary to determine future parking demand, which is a significant cost element in each alternative, especially if a parking structure

¹⁰ Ridership Analysis Technical Memorandum, prepared for Northeast Corridor Future by Parsons Brinckerhoff and AECOM, October 2015. For every 1 percent reduction in travel time for a commute trip or business trip, a 0.65 percent increase in riders can be expected. For every 1 percent reduction in travel time for all other trip types, a 1.2 percent increase in riders can be expected. NNEPRA passenger interviews conducted at PTC during July 2019 conducted as part of this overall study provide trip purpose distributions.

is required. Future year station mode of access and parking demand assumptions and estimates are detailed for each alternative.

The current and future mode of access distributions for all passengers arriving at PTC for a trip to points south on either NNEPRA, CCL, or Greyhound service are presented in Table 6-3.

Mode of Access for PTC Passengers	Current Year	Year 2040: Alternatives 5&6	Year 2040: Alternative 7	Year 2040: Alternative 8
	Bus and Rail		Rail Only	Rail Only
Parked Vehicle On-Site	41%	35%	34%	34%
Drop-Off	55%	57%	55%	54%
Local Bus	2%	6%	6%	6%
Walk	1%	1%	3%	4%
Bicycle	<1%	<1%	2%	2%
Totals	100%	100%	100%	100%

Table 6-3: Current and Future Year Station Mode of Access

The PTC site, the St. John Street site, and the Union Station site offer both opportunities and challenges to significantly improving the current fixed-route bus service. A key component in improvements is expected to be initiation of frequent, regular, and comprehensive shuttle service between the station(s) and downtown Portland. To estimate future mode of access values, it was assumed that expanded METRO service will be provided by Year 2040. This assumption increases the percentage of passengers arriving at the station via local transit to approximately six percent – a three-fold increase from the current value. Six percent is considered to be an optimal level of local transit for regions of similar size and density.

Future walk and bicycle mode of access percentages for these two Alternatives were determined based on a travel shed analysis which identified the number of people within a specific distance of each site. The St. John Street site and the Union Station site place a station closer to downtown Portland and other Portland Peninsula destinations. Therefore, a slight increase in the number of walk and bicycle trips is anticipated (Table 6-3).

6.5 Parking Demand

As stated, estimating future parking demand is important for both identifying viable station locations with adequate space for parking and estimating capital cost of providing the necessary number of parking spaces to meet demand.

The current parking supply at PTC consists of:

- North Lot that provides 371 parking spaces
- South Lot that provides 289 parking spaces

- Overflow Lot on Thompson’s Point that provides as many as 300 parking spaces

Combined parking for the north and south lots is 660 spaces. An additional 67 parked vehicles can be accommodated along the North and South Lot curbs in unmarked spaces during peak demand periods. CCL is currently in the process of expanding the south lot, which will provide approximately 560 spaces when completed. This additional south lot capacity has been incorporated into the parking demand estimates.

Current parking demand estimates presented in a 2018 MaineDOT study¹¹ indicate that parking demand exceeds the base parking supply of 660 vehicles during approximately 11 weeks of the year. During those periods, overflow parking and on-site curb space is used. The ultimate capacity (consisting of base plus all overflow parking) of 1,027 spaces is reached about one week per year.

Typical parking demand planning does not support providing spaces for all vehicles at the highest day or week of demand. Rather, consistent with standard roadway and intersection capacity practices, parking demand would be based on a time period that would accommodate most, but not all parking demand. This means the number of parking spaces should never be equal to the highest parking demand. Table 6-4 presents estimated Year 2040 peak parking demand associated with a Portland multi-modal transportation center for rail and intercity bus service. The #5 Rank Week numbers were used to forecast parking demand in the Phase 1 alternative analysis. All passenger volume, station mode of access, and parking demand values estimated were then used to conduct the alternative evaluation described in Section 6.6.

Alternative	#1 Rank Week	#5 Rank Week	#10 Rank Week
	Total	Total	Total
All Alternatives Bus	1,155	1,035	950
All Alternatives: Rail	175	162	135
Total Bus and Rail	1,330	1,197	1,085

Table 6-4: Year 2040 Peak Parking Demand – Ranked by Week

Reductions in rail passenger boardings have reduced the overall number of parking spaces identified in the Phase 2 analysis as compared to the Phase 1 analysis findings. Discussion of a potential West Falmouth rail station and the opportunity to further reduce overall and rail parking demand is described in Section 6.7. Additionally, the Phase 1 analysis findings provided a range of parking demand by alternative. The Phase 2 analysis was simplified to identify a single value for bus and rail parking to provide comparable results between alternatives. A more detailed parking demand analysis of the recommended alternative should be completed if

¹¹ Portland Transportation Center Parking Facility Study: Preliminary Financial Analysis prepared for MaineDOT by AECOM, February 26, 2018

advanced to refine the parking demand totals. For all alternatives, the opportunity to consider separate parking areas for short and long-term parking should be further evaluated for the recommended alternative due to the significant proportion of passengers who park for extended periods of time, primarily bus passengers to Logan Airport or New York City.

6.6 Alternative Evaluation

Each of the alternatives was evaluated based on measure of effectiveness criteria (MOEs) identified specifically for Phase 2 of this Study. Phase 2 MOE's are reduced from Phase 1 based consolidation of similar MOE's to provide a more focused analysis. The Phase 2 MOEs are organized into seven categories as follows.

1. Safety – how the proposed alternative affects customer and modal safety
2. Mobility – how the proposed alternative affects vehicular and non-vehicular mobility
3. Operations -how the proposed alternative addresses future parking demand, bus and rail operations
4. Environmental – how the proposed alternative affects greenhouse gas emissions as it relates to the change in travel distance and travel time, and associated train noise levels
5. Modal Connectivity – how the proposed alternative affects modal connections
6. Ease of Implementation – how readily the proposed alternative can be implemented, whether it is supported by local entities and landowners, and whether it is compatible with future opportunities
7. Costs – how comparable capital, operation, and maintenance costs are across alternative, potential funding stream, and how transportation benefits compare to costs

Evaluation of the proposed alternatives based on the MOEs is below. The MOE matrix shown in Table 6-5 uses color-coding to visually compare the MOE findings.

Safety

- *Customer Accessibility Safety and Platform Safety*
In terms of customer accessibility and platform safety, no change is anticipated with the No Build alternative while Alternatives 5-8 improve both conditions with one notable exception. Alternative 7 does not include enough area to increase rail platform size should more area be required in the future, thus limiting expansion opportunities for this specific feature.
- *Train Safety*
The No Build alternative, Alternative 5 and Alternative 6 do not result in any change in train operations and so no change to safety aspects related to train movements. Relocation and design of a new rail facility on one of two sites associated with Alternatives 7 and 8 eliminate the back-up movements by the train and additional conflicting movements, thereby improving train movement safety. Alternative 8 is located immediately adjacent to an at-grade rail crossing on Congress Street, which will increase grade crossing time for the train to slow entering or exiting the station.

PTC Study: Measures of Effectiveness (MOE) Summary Matrix
Phase 2 Alternatives Analysis

12/21/2020

MOE	No Build: Thompson's Point	Alternative 5: Existing Location for Bus and Rail with Improvements	Alternative 6: Existing Location for Bus, New Rail Location on South Side of Tracks at Existing PTC Location	Alternative 7: Existing Location for Bus and New Rail Station at St. John Street	Alternative 8: Existing Location for Bus and New Rail Station at Union Station
Safety					
Customer accessibility safety	No change	Assumes safety improvements at site - walk, bike, transit, infrastructure	Assumes safety improvements at site - walk, bike, transit, infrastructure	Assumes safety improvements at site - walk, bike, transit, infrastructure	Assumes safety improvements at site - walk, bike, transit, infrastructure
Platform safety	No change	Ability to accommodate longer platform in future if needed	Ability to accommodate longer platform in future if needed	Does not accommodate longer platform in the future	Ability to accommodate longer platform in future if needed
Train Movement Safety	Requires reverse move	Requires reverse move	Requires reverse move	Eliminated reverse move	Eliminated reverse move, increased time at at-grade crossing on Congress Street
Mobility					
Change in VMT/VHT	No change	No change	No change	Slight decrease in VMT/VHT	Slight decrease in VMT/VHT
Bus and Rail ridership changes	No change	No change	No change	No change for bus ridership, increases rail ridership	No change for bus ridership, increases rail ridership
Change in pedestrian and bicycle trips due to reduced walking distance to downtown	No change	No change	No change	Increase in pedestrian and bicycle trips to/from station	Increase in pedestrian and bicycle trips to/from station
Operations					
Parking to meet 2040 demand	Does not meet future requirements	Meets future requirements, parking structure required	Meets future requirements, parking structure required	Meets future requirements, parking structure required	Meets future requirements, parking structure required
Provides rail center platform and bypass track	Does not currently provide	Viable - can accommodate	Viable - can accommodate	Bypass track not viable	Viable - can accommodate
Rail operations	Not on rail mainline, additional rail operations required	Not on rail mainline, additional rail operations required	Not on rail mainline, additional rail operations required	On rail mainline, improves rail operations	On rail mainline, improves rail operations
Environmental					
Reduction in greenhouse gases/vehicle emissions	No change	No change	No change	Decrease in passenger vehicle emissions; decrease in train movement time	Decrease in passenger vehicle emissions; decrease in train movement time
Train operations noise	No change	No change	No change	Increased train idling time in closer proximity to neighborhoods	Increased train idling time in closer proximity to neighborhoods
Modal Connectivity					
Bus/rail in same location/customer ability to switch modes readily	Same location	Same location	Nearby	Separate locations. May require shuttle or other connection	Separate locations. May require shuttle or other connection
Access to I-295	Direct	Direct	Direct	St. John Street - farthest from I-295	Congress Street - farther from I-295
Access to existing local transit	No change - 2 routes	No change - 2 routes	No change - 2 routes	No change - 2 routes	Location adjacent to 6+ transit routes
Access to roadway network	Direct - no significant improvements	Direct - no significant improvements	Direct - no significant improvements	Additional distance, roadway and intersection improvements needed	Additional distance, roadway, intersection and at-grade crossing improvements needed
Access to existing pedestrian/bicycle networks	No change	No change	No change	Adjacent trails require improved access from new rail station	Direct connection to Portland Trail system
Ease of Implementation					
Landowner interest	CCL/MaineDOT owned	CCL/MaineDOT owned	Landowner discussions pending	Landowner discussions pending	Willing to consider
Available ROW	No ROW needed	No ROW needed	ROW required - 3.4 acres	ROW required - 2.2 acres	ROW required - 2.6 acres
Consistent with current land use/zoning	Consistent	Consistent	Consistent	Partly consistent	Consistent
Compatible with future development opportunities	Compatible	Compatible	Potential	Potential	Potential
Costs					
Estimated conceptual capital costs (2019 \$\$)	\$2.95M	\$28.3M	\$37.1M	\$36.1M	\$39.0M
Estimated annual operating and maintenance cost difference from No-Build Alternative	0	\$266,000	\$480,000	\$88,000	\$136,000
Combined/separate operating and maintenance costs	Combined - NNEPRA and CCL	Combined - NNEPRA and CCL	Combined - NNEPRA and CCL	Separate - NNEPRA rail and CCL bus	Separate - NNEPRA rail and CCL bus
Benefit/cost ratios	Not analyzed - Base Condition	0.02	-0.03	0.52	0.48
Potential to fund improvements	Funded	Private available for station; possible state/federal for track; some parking funding need	Private available for station; possible state/federal for track; some parking funding need	Private available for station; possible state/federal for track; some parking funding need	Private available for station; possible state/federal for track; some parking funding need

Notes and Assumptions
 1. Assumes that approx. 300 overflow parking spaces remain in the future for all alternatives for peak weeks
 2. A benefit/cost ratio of 1.0 or greater is considered positive

Please note - colors for each of the MOE's are used to identify differences only and should not be interpreted as fatal flaws in each alternative. MOE results are best viewed collectively to understand a full picture.

Mobility

- Change in VMT/VHT*

As in the Phase 1 analysis, there is no shift in mode of access with the No Build alternative, Alternatives 5 and 6, thereby resulting in no reduction in VMT/VHT. For Alternatives 7 and 8, enhanced rail service associated with all other alternatives attracts a limited number of new rail passengers from both bus and auto modes. Any shift from the auto mode would reduce regional VMT and VHT but would also increase local VMT/VHT associated with auto access to the transportation site. For these alternatives, VMT/VHT is estimated to slightly decrease as compared to other alternatives.
- Bus and Rail Ridership changes*

The No Build alternative, Alternatives 5 and 6 provide no opportunity to increase bus and rail ridership due to no service travel time changes. Alternatives 7 and 8 increase rail ridership by approximately 58 daily riders by relocating the rail station to the rail mainline, thus improving service travel time and increasing rail ridership.
- Change in pedestrian and bicycle trips due to reduced walking distance to downtown*

With the PTC remaining at its current location for No Build and Alternatives 5 and 6, there is no change in the pedestrian and bicycle trips between the transportation center and downtown and other destinations. While Alternative 7 is closer to downtown Portland and so to trail connections, navigation on foot or bicycle is still challenging and the shift in location will benefit only rail passengers seeking to use these modes to access the station. Alternative 8 provides the greatest opportunity to slightly enhance access to services by pedestrians and bicyclists by locating a new rail station in downtown Portland (Table 6-3) and increase walk and bike trips by up to 10 trips/day; however, bus services would retain the challenges posed at the current PTC site.

Operations

- Parking to meet 2040 demand*

The existing PTC site does not have adequate space to expand parking to meet 2040 demand, translating into a negative finding for this MOE for the No Build alternative. All other Phase 2 alternatives can accommodate future parking needs; however, a parking structure will be required to do so, adding to the capital costs associated with each of these options.
- Provides rail center platform and bypass track*

The No Build alternative does not provide a center rail platform or a bypass track. Alternative 5 provides an additional rail platform and can accommodate a bypass track in the future. Alternatives 6 and 8 can accommodate both features, while providing a bypass track for Alternative 7 is not viable.
- Rail operations*

Colocation of the PTC rail with the mainline is not feasible for the No Build alternative, nor for Alternatives 5 and 6, which maintain the existing rail station location. Alternatives 7 and 8 propose relocating the rail station, which provides the opportunity to place the new station directly on the rail mainline. Coordination with Pan Am railways, the current rail line owner, will be required to determine rail operation requirements, specifically freight rail, if the station is relocated.

Environmental

- *Reduction in greenhouse gases/vehicle emissions*

No change in existing levels of vehicle emissions will result from implementing the No Build alternative or Alternatives 5 and 6. Alternatives 7 and 8 are likely to result in a decrease in passenger vehicle emissions due to greater use of alternative modes to access a more central rail station.

- *Train operations noise*

As with greenhouse gas emissions, train operation noise will not be affected under No Build, Alternative 5, or Alternative 6. Alternatives 7 and 8 consider relocating the rail station, which may create perception of an increase in noise due to idling and horns/whistles at the stations in closer proximity to residential neighborhoods.

Modal Connectivity

- *Bus/rail in same location/customer ability to switch modes readily*

Colocation of bus and rail facilities in No Build and Alternative 5 will maintain the ability for passengers to easily access different modes. While Alternative 6 results in modifications to the existing PTC site, rail and bus will continue to be in proximity, allowing passengers to choose between rail and bus modes. Alternatives 7 and 8 envision separate rail and bus facilities, which may require a shuttle or other connection to preserve the convenience of modal choice. A separate analysis will be required to determine shuttle or other connection details, frequency and cost.

- *Access to I-295*

Direct access to and from I-295 will be maintained by the No Build alternative as well as Alternatives 5 and 6. Both Alternatives 7 and 8 will relocate the rail station farther away from access points to I-295, with Alternative 7 located at the greatest distance.

- *Access to existing local transit*

Both the METRO Route 1 and the BREEZ Express Service will continue to access rail and bus facilities under all alternatives examined in Phase 2 except for Alternative 8. The Alternative 8 rail location will be accessible via six or more local transit routes.

- *Access to roadway network*

Direct access to bus and rail facilities will be maintained under the No Build alternative and Alternatives 5 and 6. Contrarily, not only will Alternatives 7 and 8 create additional distance to the rail station, roadway and intersection improvements will be required to establish safe access to and egress from either of the two new locations.

- *Access to existing pedestrian/bicycle networks*
Passengers will be able to continue to walk or bike to the current PTC site using existing routes under the No Build alternative and Alternatives 5 and 6. Alternative 7 will require spot improvements to access a new rail facility on St. John Street from adjacent multi-use trails, while Alternative 8 will provide direct connection to the Portland Trail System.

Ease of Implementation

- *Landowner interest*
CCL and/or MaineDOT own right of way required under the No Build alternative and Alternative 5. As such, their interest in the project is implied. For the bus portion of Alternatives 6-8, CCL and/or MaineDOT own right of way required. Alternatives 6-8 require private property purchase and are likely to impact the value and viability of the properties affected; discussions are underway or pending with landowners affected by these alternatives.
- *Available ROW*
The No Build alternative and Alternative 5 require no additional right of way acquisition. Of the remaining three Phase 2 alternatives, Alternative 6 requires the greatest amount of land not already owned and controlled by CCL and/or MaineDOT, 3.4 acres compared to 2.2 or 2.6 acres required to implement Alternatives 7 and 8, respectively.
- *Consistent with current land use/zoning*
No Build alternative and Alternatives 5 and 6 result in no change to the existing transportation and transportation related land uses, which are consistent with the B-5 zoning district that allows for a wide range of commercial and mixed uses and envisions urban patterns of development. Alternative 7 shares challenges with alternatives analyzed in Phase 1 in that the location is potentially in conflict with Mercy Hospital's master plan, if only by its proximity to the medical facilities. Although Alternative 8 envisions relocating the rail station to downtown Portland, transportation use of the proposed site is consistent with the City's current land use and zoning.
- *Compatible with future development opportunities*
Similar to several earlier alternatives, the No Build alternative and Alternatives 5 and 6 have the potential to anchor future development around the PTC, resulting in a local effect because the existing site is relatively far from the urban core of the city and the presence of the highway system further acts as a divider between the urban fabric and the transportation center. As discussed in Chapter 5, even though the PTC aligns itself with the long term plans for Thompson's Point, it is expected to be challenging to integrate the center in a meaningful

way and for it to contribute to a high level of economic development and downtown revitalization without connecting it to major destinations with very rich local transit connections. Separating rail and bus modes as proposed in Alternatives 7 and 8 will result in loss of critical mass and the development of strong anchor that can form the nucleus of future development; however, relocating rail facilities to a site closer to downtown will support local development potential.

Costs

- *Estimated conceptual capital costs (2019 \$\$)*

The No Build alternative includes planned improvements at the existing PTC, which come at the lowest cost of the alternatives studied. Costs of other alternatives are more significant relative to the status quo; however, Alternatives 6, 7 and 8 require higher levels of funding due to the need for a separate rail station, rail infrastructure improvements, and roadway/intersection improvements to meet 2040 demand.

- *Estimated annual operating and maintenance cost difference from No Build Alternative*

Alternative 5 will require increase O&M costs due to the additional parking area, building size, and assumed additional staffing. Alternative 6 will have the greatest increase in O&M costs above Alternative 5 due to the separate rail station and assumed staffing, as well as increased rail infrastructure maintenance.

- *Combined/separate operating and maintenance costs*

The No Build alternative, Alternatives 5 and 6 maintain a combined bus and rail station which provides the opportunity for combined O&M costs. Alternatives 7 and 8 have separate bus and rail stations, increasing O&M costs due to staffing and maintenance required at both station locations.

- *Benefit/cost analysis*

Cost/benefit analysis was not applied to the No Build alternative as it is considered the baseline for the evaluation. A benefit/cost ration of 1.0 or greater is considered positive. None of the alternatives analyzed in this phase meet this threshold.

- *Potential to fund improvements*

Planned improvements to complete the expanded south parking lot funded by CCL are assumed for the No Build alternative. All alternatives have opportunity for private funding for stations if retail is incorporated, state and federal funds for rail track and station infrastructure improvements, and additional parking revenue to fund expanded surface and garage parking areas. Private funding opportunities not yet identified may alter or change the ratings of this MOE.

6.7 West Falmouth Station

The Phase 2 alternatives were evaluated with respect to the effect of a potential West Falmouth station on NNEPRA passenger parking demand at the PTC or at any of the alternative sites under

consideration. The evaluation was based on Amtrak Downeaster passenger zip code information provided from boarding passengers at each of the six Maine stations. This information provided a basis to determine the likely percentages of passengers to utilize a West Falmouth Station based on their assumed origin.

Based on this evaluation, the net effect of a West Falmouth station on Portland rail passenger parking demand is approximately 20 to 25 spaces. This means that the estimated rail parking demand could be reduced by up to 25 spaces if a West Falmouth station was constructed.

6.8 Phase 2 Summary

Similar to Phase 1, the Phase 2 Alternatives Analysis identified that all alternatives had benefits and impacts compared to other alternatives.

From a customer perspective, alternatives showing strong benefits in safety and modal connectivity will ultimately provide greater advantages to the customer over the long term. By maintaining a single bus and rail station, Alternatives 5 and 6 provide the greatest connectivity benefits when compared to Alternatives 7 and 8. Alternative 8 provides the greatest safety benefits but needs further evaluation to address potential at-grade crossing impacts.

From a transportation system perspective, alternatives that increased ridership provided the greatest regional benefit, reducing VMT, VHT, and greenhouse gas emissions. Alternatives 7 and 8 slightly reduce regional VMT/VHT and greenhouse gases but will require local roadway and intersection improvements to accommodate additional vehicle travel along Congress and St. John Streets. Perception that Alternatives 7 and 8 may increase noise due to start/stop movements and horns/whistles when entering the stations should be considered.

From a cost perspective, Alternatives 6, 7, and 8 had the highest capital costs due to separate rail stations and parking, along with needed rail and transportation infrastructure improvements. For O&M cost changes, Alternatives 5 and 6 had the highest increase in O&M costs as no rail staffing or operation changes were as assumed and trains will still be required to have a reverse move into the station, adding time and cost.

Key findings of the Phase 2 Alternatives Analysis are:

- **No-build Alternative.** The No-Build Alternative should be dismissed as it does not address long-term bus and rail customer needs, does not eliminate train movement safety conflict, does not promote additional bus or rail ridership, does not provide adequate parking, does not increase walk and bike trips, and does not reduce greenhouse gas emissions.
- **Alternative 5:** Alternative 5 provides strong benefits to customer safety, platform and train movement safety, meets parking demand and ability to provide necessary rail infrastructure, is a combined bus/rail station, has direct access to I-295 and the roadway network, and is the easiest alternative to implement as all improvements are on property owned by either CCL or MaineDOT. However, it does not provide any transportation

benefits as there is no additional bus and/or ridership, is not located on the rail mainline, requires a reverse move for the train into the station, and has increased O&M costs. Alternative 5 does improve customer benefits with an expanded bus/rail station, additional parking to meet demand, and rail platform and access improvements.

- **Alternative 6:** Alternative 6 provides similar benefits to Alternative 5 but separates the bus and rail station with the new rail station and parking located immediately adjacent to the bus station, minimizing the inconvenience to bus and rail passenger synergy. However, it does not provide any transportation benefits as there is no additional bus and/or ridership, is not located on the rail mainline, requires a reverse move for the train into the station, and has increased O&M costs. It has the highest O&M cost increase due to separate rail and bus station staffing and parking maintenance as well as one of the highest capital costs.
- **Alternative 7:** Alternative 7 provides benefits to safety with the elimination of the train reverse move, increases mobility with an additional 58 riders per day, reduces VMT, VHT, and greenhouse gases, and improves rail operations by being located on the rail mainline and eliminating the reverse move. It is located somewhat closer to downtown as compared to Alternatives 5 and 6, but not as close to the urban core as Alternative 8, resulting in slight improvements in pedestrian and bicycle trips. This alternative does not accommodate larger platforms for passenger safety or an additional rail bypass track in the future if ridership increases, which may impact future rail operations and expansion opportunities. This alternative may be perceived to increase noise due to trains idling, separates bus and rail passengers into two stations, has a limited number of existing transit lines passing by, and may not be compatible with future development plans in the vicinity of St. John and Valley Streets. It is also one of the highest priced alternatives along with Alternatives 6 and 8.
- **Alternative 8:** Alternative 8 provides strong benefits to customer and train movement safety, improves rail operations by being located on the rail mainline thereby eliminating the reverse move, and can accommodate a bypass track and a rail center platform. This alternative also meets required parking demand, , improves mobility with an additional 58 rail riders per day, reduces VMT, VHT, and greenhouse gases, and is located the closest to downtown of any alternative, which slightly increases pedestrian and bicycle trips over Alternative 7 by approximately one percent, or up to 10 trips per day. It provides the maximum opportunity to increase local transit trips due to the proximity to the greatest number of transit lines and provides a direct connect to the Portland Trail system. This alternative separates bus and rail passengers with two stations and may be perceived as increasing noise due to trains idling. It is one of the highest priced alternatives along with Alternatives 6 and 7.

Findings from the Phase 2 Alternatives Analysis led to a Study recommendation, which is discussed in Chapter 7.

7. Summary of Findings and Recommendations

7.1 Introduction

The PTC was built and opened for bus service at Thompson's Point in 1996 and underwent reconstruction in 2001 for the addition of rail service. Today, it provides intercity bus and rail service through CCL and the Downeaster, respectively. Recently, numerous studies have sought to determine the future needs and objectives for both valued carriers, as well as assess whether the current location and associated infrastructure will best meet these needs over the long term.

Bus advocates support the current location due to its easy and immediate access to I-295 and parking availability. Rail advocates support the opportunity to relocate to the rail mainline to improve travel times, safety, and maximize opportunity for future expansion. The current location remains auto dependent due to passenger origins as well as the station being located outside of downtown Portland with limited local transit service. Results of several surveys discussed in this report show that: customers use the PTC mostly on an infrequent basis; have a strong connection to using both modes of travel but not necessarily on the same trip; would like to see improved connections to the downtown via transit or shuttle; and are split on whether or not separating the bus and rail stations is important to them. From a transportation perspective, traffic on I-295 through Portland continues to grow, resulting in increasing safety and mobility issues. Growth in local, regional, and intercity/interstate bus and rail service is necessary to balance transportation needs long term. Municipal engagement with transportation agencies and service providers is also essential to improving integration with transportation and land use in a meaningful and positive way.

These challenges, opportunities and needs have prompted the MaineDOT to initiate the PTC Study, engage the Principal Stakeholders, and seek an outcome that best balances customer and transportation system needs.

7.2 Overview of Analysis

The purpose of the PTC Study was to compile and assimilate current and past efforts that sought to address specific location and carrier needs and combine these efforts with the evaluation of various alternatives to determine which alternative best addresses customer and transportation system needs. The PTC Study's goal is to recommend practicable solutions that enhance customer satisfaction and improve long-term mobility and safety for the region.

The Study was conducted in two Phases:

- Phase 1, which consisted of evaluating seven alternatives plus a no-build alternative using 33 broad MOE's
- Phase 2, which consisted of evaluating four alternatives plus a no-build alternative using 24 more focused MOE's

All alternatives were evaluated for the Year 2040 to determine the long-term benefits that can be achieved. The initial Study scope identified six alternatives for evaluation along with 16 MOE's. Through strong Principal Stakeholder participation and input, a total of 13 alternatives and 33 MOE's were identified, analyzed and incorporated into the Study findings.

7.3 Summary of Alternatives

Alternatives for the PTC Study fell into one of three categories: alternatives in which both bus and rail remain at the existing PTC location; alternatives with new locations for both bus and rail; and alternatives in which bus and rail are separated, with bus remaining at the existing PTC location and rail relocating to a new site along the rail mainline.

The nine alternatives analyzed under the two Study Phases were as follows.

Phase 1

No-build Alternative: Existing PTC Location on Thompson's Point for bus and rail with only planned and funded improvements

1. **Alternative 1:** Existing PTC Location on Thompson's Point for bus and rail with additional improvements, including the Wye Track for rail
2. **Alternative 2a:** New Location on Fore River Parkway for bus and rail, serving all required parking needs
3. **Alternative 2b:** New Location on Fore River Parkway for bus and rail, serving short-term parking needs only
4. **Alternative 3a:** New Location on St. John Street for bus and rail, serving all required parking needs
5. **Alternative 3b:** New Location on St. John Street for bus and rail, serving short-term parking needs only
6. **Alternative 4a:** Existing PTC Location for bus with new rail station on Fore River Parkway
7. **Alternative 4b:** Existing PTC location for bus with new rail station on St. John Street

Phase 2

No-build Alternative: Existing PTC Location on Thompson's Point for bus and rail with only planned and funded improvements

8. **Alternative 5:** Existing PTC Location on Thompson's Point for bus and rail
9. **Alternative 6:** Existing PTC Location on Thompson's Point for bus in its existing location on north side of tracks and rail on south side of tracks
10. **Alternative 7:** Existing PTC Location on Thompson's Point for bus and Ferguson Property area on St. John Street for rail
11. **Alternative 8:** Existing PTC Location on Thompson's Point for bus and Union Station area adjacent to Congress Street for rail

7.4 Summary of Findings

Using the Study Purpose established at the start of the process, the Study Team determined the reasonableness of each of the four alternatives evaluated in Phase 2 by summarizing under the following categories:

- How the Alternative addressed Customer needs;
- How the Alternative addressed Transportation System needs;
- Was the Alternative cost-effective;
- How the Alternative can be supported, implemented and potential funding sources identified.

Table 7-1 summarizes the reasonableness of each alternative evaluated using the extensive analysis document in this report and summarized in Table 6-5 (MOE Matrix). This table utilizes the ratings from the MOE Matrix to weigh impacts and benefits of each alternative within each of the four categories. Meeting customer needs is determined by assessing how well the alternative meets the safety, connectivity, and customer mobility MOE's. Meeting transportation system needs is determined by assessing how well the alternative meets the transportation mobility, operations including the ability to add a rail center platform and bypass track, operations cost efficiency, and environmental MOE's. Meeting the cost-effective needs is determined upon whether the alternative has a benefit/cost ratio greater than 1.0. Determining if the Alternative can be supported, implemented and funded is determined based on landowner interest, consistency with current land use/zoning, compatible with future developments, and potential to fund the improvements.

The ultimate suitability of each alternative is shown as the overall Level of Reasonableness which represents the ability of the alternative to meet the Study purpose as identified in Section 1.3. This approach allows a greater emphasis to be placed on the customer and transportation system measures, which is the overall focus of this Study.

Alternative		Meets Customer Needs	Meets Transportation System Needs	Cost Effective (B/C>1)	Supported, Can be Implemented and Potential Funding	Level of Reasonableness
NB	No-Build	Rank – 5 (Lowest)	Rank – 5 (Lowest)	No	Rank – 1 (Highest)	Low
5	Existing PTC location for bus and rail with improvements	Rank – 1 (Tied, Highest)	Rank – 3 (Tied, 2 nd lowest)	No	Rank – 2	Moderate
6	Existing PTC location for bus, new rail station south of PTC location with improvements	Rank – 3 (2 nd Highest)	Rank – 3 (Tied, 2 nd lowest)	No	Rank – 3 (Tied, 2 nd Lowest)	Moderate
7	Existing PTC location for bus with improvements, new rail station on St. John Street	Rank - 4 (2 nd Lowest)	Rank – 2	No	Rank – 5 (Lowest)	Moderate
8	Existing PTC location for bus with improvements, new rail station at Union Station	Rank – 1 (Tied, Highest)	Rank – 1 (Highest)	No	Rank – 3 (Tied, 2 nd Lowest)	High

Table 7-1 Summary of Reasonableness of Alternatives

Table 7-1 shows that Alternative 8 has the highest reasonableness ranking as compared to all other alternatives. Of those alternatives with a moderate level of reasonableness, Alternative 5 could be considered as having a greater combined customer and transportation system level of benefit. Therefore, a direct comparison of these two highest ranking alternatives finds the following.

Alternative 5

- Alternative 5 provides the highest customer benefits (tied with Alternative 8) by maintaining the connectivity between bus and rail modes at the existing PTC location, having the ability to maximize passenger safety by providing longer rail platforms and a bypass track for freight rail, and having the most direct access to I-295. Alternative 5 provides increased parking to meet future demand, additional bus bays for expanded bus service, and additional rail platforms and infrastructure to support additional rail service, all of which benefit customers.
- Alternative 5 provides the second lowest transportation system benefits (tied with Alternative 6) by having the ability to provide a second, center rail platform and bypass track for freight rail, meeting future parking demand, and minimizing operating and maintenance cost efficiency with having all operations at the existing PTC location. Alternative 5 does not benefit customers by resulting in any additional bus or rail travel time benefits and so does not increase ridership. Neither does it eliminate the train reverse move on the mainline, which adds time and cost to the Downeaster.
- Alternative 5 is the second highest supportable alternative because it does not require any additional property to implement, is consistent with current plans at Thompsons

Point, is consistent with City of Portland land use, and is lower cost with anticipated funding from various sources including CCL and from additional parking revenues.

- Alternative 5 has one of the lowest benefit/cost ratios, with a value of 0.02 due to minimal additional transportation system benefits provided as compared to the \$28.3M in capital costs.

Alternative 8

- Alternative 8 provides the highest customer benefits (tied with Alternative 5) by: having the ability to maximize passenger safety by providing longer rail platforms and a bypass track for freight rail; eliminating the train reverse move on the mainline; being immediately adjacent to numerous local transit routes; and being the closest alternative to downtown Portland to walk and bike. Alternative 8 provides increased parking to meet future demand and decreases rail travel times for rail customers to/from the Brunswick and Freeport. Alternative 8 retains bus at the existing PTC locations, which provides immediate access to I-295. Alternative 8 eliminated bus and rail synergy by having separate bus and rail stations.
- Alternative 8 provides the highest transportation system benefits by increasing rail ridership, reduces VMT, VHT, and greenhouse gases, provides a second, center rail platform and bypass track for freight rail, and increases walk, bike and transit trips compared to other alternatives. Alternative 8 will add redundant operations and maintenance costs with an additional rail station and will require an additional connection between the bus and rail stations through increased transit or last mile shuttle connection for the 10% of passengers who use different modes during their trip.
- Alternative 8 is the second lowest supportable alternative as it is consistent with current land use and with future development opportunities. However, Alternative 8 requires additional property to implement, needs landowner and City of Portland support, and is one of the most-costly alternatives to implement due to the addition of the rail station. For CCL, Alternative 8 continues the current operations.
- Alternative 8 has one of the highest benefit/cost ratios at 0.48, but it remains under 1.0. Alternative 8 provides improved transportation system benefits with slight decreases in VMT/VHT, increased rail ridership, small increases in bicycle and pedestrian trips, but not enough benefits to offset the \$39.0M in capital costs.

7.5 Recommendations

Based on the quantitative and qualitative analysis of the Phase 2 Alternatives, combined with supporting information from the Phase 1 findings, the Study Team recommends further evaluation of Alternative 8. This is based on the alternatives ability to provide the highest transportation benefit coupled with its ability to provide the highest customer benefits of all alternatives evaluated. The value of transportation benefit should be considered the highest above all other benefit opportunities. While the benefit-to-cost ratio for Alternative 8 is less than 1.0, further evaluation could identify additional transportation, economic, and land use benefits that could help offset identified costs for this alternative.

Based on this recommendation, the Study Team recommends the MaineDOT take the short-term and long-term actions described below. Short-term actions would begin immediately and ideally conclude within the next two years. Long-term actions could begin prior to the conclusion of some or all short-term actions, concluding within the next five years.

Short-term Actions:

1. Create a short-term investment, operation and maintenance PTC plan that focuses on enhancing both bus and rail ridership and maximizing benefit to both the customer and transportation system.
2. Conduct a more detailed evaluation of Alternative 8 to provide a greater level of information to support advancing this alternative. This includes an analysis of creating connectivity between the bus and rail station. This effort should encourage participation from relevant Principal Stakeholders and other stakeholders.
3. Incorporate short- and long-term actions into local/state/agency master plans.

Long-term Actions:

1. Identify sources and secure funding to implement Alternative 8 if more detailed evaluation shows benefits outweigh costs;
2. If further study shows positive benefit-cost comparison, implement Alternative 8 under the following conditions:
 - Landowner willingness to work in partnership towards a mixed-use development opportunity at this location that includes a rail station;
 - NNEPRA and City of Portland support;
 - Alternative is consistent with current master plan for this area;
 - Increased connectivity between the bus and rail stations can be accommodated through increased transit or implementation of a last mile shuttle;
 - Continued partnership with MaineDOT and CCL for the necessary improvements to the existing PTC location for bus station passengers and operations; and
 - Funding can be secured.
3. Identify a public entity that owns and/or operates the PTC and new rail station(s), similar to many public transportation centers, thereby allowing opportunity for all modes and carriers to be equally managed and invested.