

Westbrook to Portland Conceptual Rail Transit Study

PREPARED FOR



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June 28, 2019

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1

Introduction

The Northern New England Passenger Rail Authority (NNEPRA), in partnership with Waterstone Properties Group, engaged VHB to perform a high-level conceptual evaluation of a potential rail transit link between Westbrook, ME, the existing Portland Transportation Center (PTC), and a future terminal in the Old Port area in Portland. Station stops in Westbrook include the downtown area near Main Street and the planned Rock Row development. These potential station stops in Westbrook along with the existing PTC are located on Pan Am Railways Mountain Branch. The potential service would continue onto the Pan Am Railways Freight Main Line at Control Point Freight (CPF) 196 for approximately 1,000 feet before exiting at the Portland Wye Track under Veterans Memorial Bridge and then would continue east along West Commercial Street. Potential Portland station locations considered during this study included a possible station on the south side of West Commercial Street near the International Marine Terminal (IMT) and on the north side of West Commercial Street/Commercial Street at Harbor View Memorial Park. Based on discussions with MaineDOT, the possible station location on the south side of West Commercial Street near the IMT was eliminated from further consideration because it would conflict with improvements planned in that area for the IMT.

In addition to the required infrastructure improvements, two high-level operating plans were considered. One operating plan would allow for 45 minute peak headways and the second operating plan would allow for 30 minute peak headways. The evaluation of each operating plan includes the proposed infrastructure improvements (consistent for both operating plans), the operating plan details, estimated operating and maintenance (O&M) costs, and estimated ridership. This report summarizes the findings of these high-level evaluations.

In addition to this study, NNEPRA has engaged VHB to complete two other high-level conceptual evaluations in this area: 1) for relocating the Downeaster's Portland station from

the existing PTC to a new location on the Pan Am Railways Freight Main Line, and 2) in partnership with Waterstone Properties Group, for a rail-with-trail facility along the same general corridor as this potential Westbrook to Portland rail transit link.

2

Overview of the Corridor

On December 5, 2018, representatives from VHB accompanied the Pan Am Railways Track Department on a hi-rail trip from downtown Westbrook to the Portland IMT. VHB performed a visual assessment of the existing infrastructure to serve as a baseline for evaluating improvements that may be required to support the proposed transit service.

The corridor being examined for potential passenger rail service generally runs from West Commercial Street near the Old Port area of Portland to the Frenchtown neighborhood near Main Street in downtown Westbrook. The alignment for the majority of the corridor consists of multiple segments of existing tracks that are currently owned and operated by Pan Am Railways including:

- › The Portland Wye and Yard 8 tracks that lead to the IMT along West Commercial Street (approximate 1.25 mile segment);
- › The Pan Am Freight Main Line at Control Point Freight (CPF) 196 (approximately 0.2 miles between the Portland Wye and the Mountain Branch turnouts);
- › The Pan Am Mountain Division Branch Line from CPF 196 to Control Point Mountain (CPM) 2, located near the Portland Transportation Center (approximately $\frac{3}{4}$ -mile); and
- › The Cumberland Mills Industrial Track, which begins at CPM 2 and extends west beyond the proposed station in downtown Westbrook (approximately 3.6 mile segment).

The preferred alternative includes the construction of approximately $\frac{3}{4}$ -mile of new track at the Portland end of the corridor in order to bring the rail service closer to the Old Port area of

downtown Portland than would be possible using the existing tracks. See Appendix C for figures showing the preliminary potential alignment for the service.

The portion of the existing rail corridor in the West Commercial Street area (Portland Wye and Yard 8 tracks) are currently used exclusively by freight on an as-needed basis with an estimated two to four trains per week (subject to the service needs of the independently operated IMT). The rail corridor east of Cassidy Point Drive that leads to the IMT was recently acquired by the State of Maine.

The Freight Main Line and the eastern portion of the Mountain Branch (from CPF 196 to CPM 2) are used to support the Amtrak Downeaster inter-city passenger rail service. Pan Am Railways Freight Main Line is a two track main line operation in the general vicinity of the study area (between CPF 195 east of the Congress Avenue at-grade crossing in Portland to CPF 196 near the Yard 8 wye tracks in Portland). The track located on the northern/western portion of the Right-of-Way (ROW) is designated as the No. 1 Track and the track on the eastern/southern portion of the ROW is designated as the No. 2 Track.

The existing PTC facility is served by the Amtrak Downeaster and is situated on the Pan Am Railroad Mountain Branch, accessible from the Freight Main Line at the CPF 196 Interlocking. The Mountain Branch is a single track branch line that is only accessible from an eastbound direction via a left-hand No. 10 turnout situated on the No. 1 Track. There is a crossover between the two Freight Main Line tracks immediately adjacent to the Mountain Branch switch, allowing an eastbound train on Freight Main Line No. 2 Track to access the Mountain Branch and continue on towards the PTC. There is also a westbound left-hand No. 10 switch from the No. 2 Track to the Portland Wye track that leads to Yard 8 situated within the limits of the CPF 196 interlocking. All of the turnouts and crossovers within the interlocking are equipped with automatic switch machines.

Due to the limited track configuration, trains headed east from the PTC bound for Freeport/Brunswick are required to reverse move onto the Freight Main Line, pulling beyond the switch to the Mountain Branch before proceeding. The reverse move is also required for any westbound trains coming from points east and bound to serve the existing PTC. These reverse movements result in an additional 10 to 15 minutes being added to the overall trip time for Amtrak Downeaster trains and are required at least eight to ten times per day. As part of a separate study, NNEPRA is considering the possibility of relocating the Amtrak Downeaster's Portland station to the Pan Am Railways Freight Main Line to eliminate this reverse move and the associated impacts on trip time.

The Pan Am Railways Freight Main Line extends from Mattawamkeag, Maine to Mechanicville, New York (approximately 475 miles) and is used to support their freight rail service throughout New England and New York. The portion of the Freight Main Line within the study area is used by local (i.e. unscheduled/as-needed) service with an estimated eight to twelve freight trains per day regularly operating through CPF 196.

The Mountain Branch is generally single track, however there is a second run-around track that extends from Mile Post 1.64, passing by the station platform situated on the north (opposite) side of the ROW through CPM 2. NNEPRA currently owns and maintains two stub-ended layover tracks that are accessible from the run-around track. Historically, the Mountain

Branch was used by Pan Am to serve customers at Thompsons Point, however these facilities are no longer receiving freight service. Currently, Pan Am only uses the Mountain Branch to access and serve their existing customers further west on the Cumberland Mills Running Track.

The Cumberland Mills Running Track extends from CPM 2 (Mile Post 1.92 to Wood Yard at Mile Post 5.73). Currently, the only active customers on the line are Dead River Propane (typically two trains per week) located near Mile Post 4.7 and Cumberland Mills located at the western end of the line beyond the proposed downtown Westbrook terminal station (typically one train per week). As referenced in Section 4, there are several other facilities that either have existing sidetracks that are currently out of service or previously had freight sidings but their switches onto the tracks have since been removed.

While Pan Am Railways makes a distinction between the Mountain Branch and Cumberland Mills Running Track at CPM 2, this report refers to the entire line as the Mountain Branch for simplicity.

3

Potential Station Locations

As discussed in Section 2, the area that is under consideration for the potential passenger rail service to Westbrook runs from downtown Westbrook to the west and the West Commercial Street area in Portland to the east. Potential station locations were identified at either end of the potential service to determine where the service could be terminated. In addition to the stations at either end of the service, at least two additional stations would be located along the corridor; one at the planned Rock Row development near Larrabee Road in Westbrook and one at the existing Portland Transportation Center.

3.1 Portland – West Commercial Street/Commercial Street Station

In Portland, two potential locations were identified along West Commercial Street for the eastern terminal location for the service. The first potential location is north of West Commercial Street/Commercial Street near the Casco Bay Bridge at Harbor View Memorial Park. The second potential location is south of West Commercial Street near the International Marine Terminal (IMT). Based on discussions with MaineDOT, the possible station location on the south side of West Commercial Street near the IMT was eliminated from further consideration because it would conflict with improvements planned in that area for the IMT.

Terminating the Portland end of the service as near as possible to the Old Port area of Portland would create a more desirable transit connection for riders starting or ending their trip in downtown Portland. To achieve this connection, the proposed station would have to be located on the north side of West Commercial Street/Commercial Street due to the existing IMT that is located south of the roadway. Based on a field review of the existing area, it appears

that this connection could possibly be achieved by constructing a station near the existing Casco Bay Bridge at Harbor View Memorial Park.

To reach this destination, the tracks would have to cross West Commercial Street. Due to the existing high traffic volumes on West Commercial Street, it is very unlikely that MaineDOT, City of Portland and the train operator would allow for a new at-grade crossing at this location. Because of this, a new overhead bridge that would carry West Commercial Street over the proposed track approximately a quarter-mile east of Cassidy Point Road would need to be constructed. MaineDOT is currently considering potential improvements to the Cassidy Point Road intersection independent of this project. In addition to the potential intersection improvements, MaineDOT is also considering possible capacity improvements to West Commercial Street in the vicinity of Cassidy Point Road. The new overhead bridge could possibly be coordinated with these future improvements. Once the track has crossed under West Commercial Street, it would proceed east on an abandoned railroad track alignment roughly parallel to West Commercial Street and continue behind the commercial properties along West Commercial Street. The track would then cross through an existing unused rail tunnel under Beach/York Street and the Route 77 southbound on-ramp to Casco Bay Bridge, then continue into Harbor View Memorial Park. The station platform would be located in Harbor View Memorial Park, either east or west of the approach spans of the Casco Bay Bridge. The final location of the station platform would depend on the clearance to the piers of the Casco Bay Bridge and the required configuration of the tracks at the station platform as well as the mitigation of any permitting issues relative to impacting park land and/or open space. This station is currently proposed to be a side platform on single track to minimize these potential conflicts. While the station platform would be located on a single track, a section of double tracking is recommended on the approach to the station. Based on the preliminary operating plan discussed in Section 5, a meet point is not required at the station. However, in the event that a train is either delayed getting to the terminus station or requires more time than anticipated to turn, a second track would be needed to allow the train leaving the station to pass the next train arriving at the station. If this section of double track is not provided at or immediately adjacent to the station, the approaching train would have to hold at the nearest section of double tracking to allow the delayed departing train to pass. This would require the approaching train to wait at the nearest existing double track section which is located near MPL 1.6 on the Mountain Branch, approximately 1.6 miles from the station. This station location would bring the service directly to the western end of Portland's Old Port area.

Constructing the proposed track behind the existing office and retail building at 75 West Commercial Street would displace many of the existing parking spaces. New parking spaces would need to be constructed at the east and west sides of the building to replace these displaced parking spaces.

There is an existing gravel lot at 450 Commercial Street, immediately east of Harbor View Memorial Park, that is currently owned by the City of Portland. This existing gravel lot could be upgraded to a paved lot to provide approximately 110-120 parking spaces for continued use by the general public and for users of the proposed service. See Figure 1 below for an aerial view of this potential station location and the conceptual plans in Appendix C for additional information.

Figure 1 West Commercial Street Station

This station location on the north side of West Commercial Street/Commercial Street near the Casco Bay Bridge is the recommended station location due to its proximity to the Old Port area of Portland.

3.2 Westbrook – Main Street Station

In Westbrook, two potential locations were identified adjacent to Main Street for the western terminal location for the service. By terminating the west end of the service near Main Street, an important transit link would be made between the downtown areas of Westbrook and Portland. The first potential location is west of Main Street near an existing athletic field area owned by the City of Westbrook. The second potential location is east of Main Street adjacent to the Stockhouse Restaurant.

3.2.1 Main Street Station Option A – West of Main Street

This City of Westbrook owns an existing athletic field complex just west of Main Street and immediately north of the existing Pan Am Railways Mountain Branch. This location is already immediately adjacent to the Mountain Branch and would therefore not require construction

of a new track corridor to serve the property. In addition to being adjacent to the existing tracks, this site would likely be able to support a small parking area for the station with approximately 75 parking spaces. For the purposes of this conceptual study, it was assumed that side platforms would be constructed on both tracks. Similar to the Portland terminus station locations, a section of double tracking at or immediately adjacent to the proposed Westbrook terminus stations is recommended to reduce the possibility of delays cascading from one delayed train to the next. Additionally, at the Westbrook end of the service providing double tracking at the station would provide maximum operational flexibility for the interaction of the proposed transit service with freight trains. It is not anticipated that any of the existing athletic fields would be impacted by the construction of the station or parking area.

The station location would be situated behind an existing retail and auto body shop located on Main Street. Access to the station would be provided by the existing access road for the athletic fields near 496 Main Street. See Figure 3 below for an aerial view of this potential station location.

Figure 3 Main Street Station Option A



3.2.2 Main Street Station Option B – East of Main Street

A second potential station location to terminate the service in Westbrook was identified east of Main Street. This location would involve the construction of station platforms on both tracks, generally adjacent to the Stockhouse Restaurant. Similar to Option A, this location is immediately adjacent to the existing Mountain Branch and would not require establishment of a new rail corridor section. While the Stockhouse Restaurant would not be directly impacted by the construction of the station, a small amount of property would likely need to be acquired for access to construct the station platforms. In order to support this option, the eastern limit of the recommended double-track section would be extended through the Seavey Street and

Lamb Street at-grade crossings. Unlike Option A, there would not be sufficient space at this location to build a parking lot solely for the use of the transit service.

Access would be provided by the existing Stockhouse Restaurant access road at approximately 506 Main Street. See Figure 4 below for an aerial view of this potential station location.

Figure 4 Main Street Station Option B



3.2.3 Comparison of Main Street Station Options

The two potential station locations in Westbrook are very close to Main Street and essentially located across the street from each other. Due to the proximity to each other, neither station has a significant advantage relative to its location.

Option B is located before the Main Street grade crossing so if this location was used, the Main Street grade crossing would not be impacted by the service crossing the road each time it entered the station. However as noted above, Option B does not have sufficient space for the construction of parking lot for the users of the service. Additionally, the station platform would be located immediately adjacent to Stockhouse Restaurant parking area. This parking area can often fill up during peak times for the restaurant and having the station platform at the same location could cause additional parking issues.

Since both options provide similar connectivity to downtown Westbrook, Option A is the recommended station location due to the ability to construct a parking lot adjacent to the station platform and not having to extend the recommended double-track section through two additional grade crossings as would be required for Option B.

3.3 Intermediate Station Locations

In addition to the terminal stations in Portland and Westbrook, two intermediate station locations were considered for the potential service; one at the existing PTC in Portland and one at the future Rock Row development in Westbrook.

3.3.1 PTC Station Location

The PTC currently serves the Amtrak Downeaster, Concord Coach Lines, and various other local and regional bus services. The PTC is located at 100 Thompsons Point in Portland and the train station at the PTC is located at mile post 1.85 on the Mountain Branch. The PTC currently only has a single platform serving the Mountain Branch. It is likely that a second platform would be required to accommodate the meet/pass requirements of the potential high-frequency service. Additionally, it's likely that Pan Am Railways will require an up-and-over connection between the two platforms rather than an at-grade crossing at this location due to the frequency of the Amtrak Downeaster occupying the station platform. By stopping at the PTC, this would provide a connection between the potential service to Westbrook and the larger regional transit network. In addition to the connection to the larger regional transit network, the PTC train station is located at the entrance to Thompson's Point. Thompson's Point has a variety of dining, entertainment and museum destinations including an outdoor summer concert venue. A stop at the PTC would provide direct transit access from the other stations along this potential service to these destinations at Thompson's Point.

As noted in Sections 1 and 2, there is a separate ongoing study to assess the feasibility of constructing a new train station on the Freight Main Line and relocating the Downeaster there. Since no decision has been finalized, this analysis assumes the existing PTC remains as the train station for the Downeaster. Should a new station be constructed on the Freight Main Line, consideration should be given to providing bus transit service between the Freight Main Line station and the existing PTC to preserve the intermodal connection to regional bus service and to provide better access to Thompson's Point. While it is not necessary for the proposed transit service, relocation of the existing train station from the PTC to the Freight Main Line would benefit this proposed service.

3.3.2 Rock Row Development Station Location

A future mixed-use development is planned at the former Blue Rock Industries gravel pit and quarry in Westbrook. The Rock Row development is bound by Main Street to the North, Route 25 to the South, the Maine Turnpike/Interstate 95 to the east, and Larrabee Road to the west. The Mountain Branch runs through the middle of the development and Rock Row is at approximately Mile Post 4.3. When complete, the Rock Row development is anticipated to include residential housing, retail and restaurant spaces, office space, and entertainment venues. By providing a transit connection to this development, people from Portland and Westbrook will be able to use transit to access the retail, office, and entertainment spaces at Rock Row and residents of Rock Row will have a transit connection to downtown Portland and Westbrook. As part of the potential service, two station platforms would be constructed at the Rock Row development. Any additional improvements, including an up-and-over connection

between the two platforms, station parking and roadway access are assumed to be constructed as part of the development and have not been included in the estimated costs for the implementation of this service.

4

Required System Improvements

4.1 Summary of Evaluation and Proposed Improvements

With the exception of the Freight Main Line and Mountain Branch from CPF 196 to CPM 2, the majority of the proposed corridor is classified as industrial non-controlled track. The Freight Main Line and the portion of the Mountain Branch from CPF 196 to Mile Post 1.65 (near the eastern limit of the Amtrak run-around track below the I-295 overhead bridges) is furnished with continuously welded rail and a wayside signal system. The majority of the rail in the industrial and yard areas is jointed 115-lb rail, however there are a handful of sections that are jointed 100-lb rail. There are sections of existing double-track along the corridor including between:

- › I-295 overhead bridge and Mile Post 2.15 (Amtrak Runaround & Layover = 0.5 miles)
- › Forest Street and Larrabee Road (Dead River Propane = 0.45 miles)
- › Main Street and Seavey Street in Westbrook (near eastern spur to Cumberland Mills (currently out of service) = 0.2 miles)

Generally, these segments are double-tracked in order to adequately support existing Amtrak and freight service operations. The Maximum Authorized Speed (MAS) on the Freight Main Line portion through CPF 196 and the Mountain Branch is 25 mph while the remainder of the corridor is restricted speed not to exceed 10 mph. Train crews are required to stop and provide on-ground warning at all existing grade crossings on the Cumberland Mills Running Track. According to Track Department Personnel, Pan Am Railways strives to maintain track conditions to FRA Class 1 on the industrial and yard tracks and to FRA Class 2 on the Freight Main Line and Mountain Branch.

The following standards are assumed to be required at a minimum to support the proposed transit service:

- › Track infrastructure maintained to FRA Class 3 (capable of supporting up to 60 mph passenger service);
- › Continuous Welded Rail on all tracks where the proposed service will be operating;
- › Modernized automatic highway crossing warning (AHCW) devices at all public at-grade roadway crossings;
- › Wayside equipment to support Automatic Train Control Protection System including Cab Signaling (federally required for any rail lines with more than six round trips per day); and
- › Culvert and drainage improvements as necessary for satisfactory stormwater management.

Based on an initial evaluation of the two conceptual operating plans under consideration for the proposed transit service, the most likely meets would generally occur (i.e., places where two trains heading in opposite directions would need to pass) near the two terminal ends of the service as well as near the midpoint of the corridor. This infrastructure assessment focused on providing as much double-tracked territory as possible within these areas of the corridor to provide maximum operational flexibility.

Key constraints that would make creation of a two-track corridor difficult include:

- › Lack of sufficient railroad embankment and/or property ownership to support necessary infrastructure and track spacing;
- › Potential conflicts with existing and/or future passenger and freight rail service operations; and
- › Impacts to wetlands and other sensitive receptors.

As referenced in Section 2, there are several properties located within the study area that may have been historically served by freight rail. For the purposes of this evaluation, it was assumed that any siding that had an existing switch on the main running track would need to be replaced in kind, even if it appears that the siding may not be actively receiving freight at this time. Former siding locations where the switch had been removed from the track were assumed unnecessary and were omitted from the cost estimate.

Areas where construction of additional tracks does not appear to be reasonably achievable to accommodate transit service meets include:

- › The eastern terminal point of the service between Commercial Street and the pier supports of the overhead Casco Bay bridge;
- › The Pan Am Railways Freight Main Line and Portland Wye tracks that pass underneath Veterans Memorial Bridge and Cassidy Point Drive;
- › Between approximately Mile Post 2.15 to 2.75 due to limited available embankment and relatively poor topographic conditions (roadway at-grade crossing angles and fairviews);
- › The section of single track on the Mountain Branch that runs through Fore River

Sanctuary (wetlands area), approximately from Mile Post 2.75 to 3.50; and

- › The existing track on the northern portion of the ROW between Larrabee Road and Forest Street on the Mountain Branch (Mile Post 4.66 to 5.10) will be used by freight only.

Based on the discussions above, sections that are envisioned to accommodate the recommended two-track operations to support the preferred alternatives for transit service include:

- › Approximately 1,200-foot long “holding track” where a carset could wait to serve a single-track platform near Casco Bay Bridge. (Note: It is assumed that the area between the Casco Bay Bridge pier and West Commercial Street would only be sufficient to accommodate one track. Additional survey and geotechnical evaluation is needed to determine if a second track can be located behind 75 West Commercial Street, as a relatively high embankment and retaining wall structures are located to the north of the proposed track).
- › The existing second track between Mountain Branch Mile Post 1.64 to 2.15 could be dedicated to the transit service if NNEPRA were to determine that those facilities are no longer needed to support their Downeaster service (as referenced above, NNEPRA is currently evaluating feasibility of relocating their station platform onto the Freight Main Line which may make these facilities unnecessary).
- › Construction of a new second track on the northerly side of the Mountain Branch ROW between the western extent of the Fore River Sanctuary (approximately near Mile Post 3.50) and Larrabee Road at-grade crossing (Mile Post 4.60), including the proposed Rock Row development.
- › Reestablishment of the second track between Seavey Road at-grade crossing, through Main Street and the proposed downtown Westbrook terminal station to the existing turnout east of the Presumpscot River bridge. (It is assumed that the eastern rail connection to the Cumberland Mills facility will need to be replaced in-kind although it is currently out of service. A separate turnout is proposed west of this switch to support transit service along with a crossover just east of the Main Street at-grade crossing to provide additional operational flexibility to serve the station platform or for freight to bypass).

In addition to the areas that will be double tracked, a new section of tracks would need to be constructed between near Cassidy Point Drive and the terminal station near Casco Bay Bridge to bring the service under West Commercial Street, as noted in Section 3 above.

4.2 Additional Challenges

The following additional challenges were identified as potential risks to development of the proposed transit service that would need to be addressed to allow the project to move forward:

- › A significant amount of property acquisition and/or easements would be required at the West Commercial Street end of the project to construct the new track along the

north side of West Commercial Street. Additionally, the current vision is to have the terminal station at West Commercial Street at Harbor View Memorial Park. Coordination with the City of Portland will be required regarding the ability to construct the track and station platforms on existing park land.

- › Preliminary discussions with Pan Am Railways have taken place regarding this project. These discussions will need to continue as the proposed service configuration is refined to ensure that Pan Am Railways' existing operations would not be negatively impacted by the proposed transit service. Most notably, the proposed corridor utilizes an approximately 1,000-foot section of their Freight Main Line to cross from the Portland Yard 8 area to the Mountain Branch. Development of a detailed service plan and evaluation of the potential impacts to the twelve scheduled Amtrak trains per day and the estimated eight to twelve freight trains by the transit service is beyond the scope of this conceptual study. In the event that the Amtrak Downeaster does not relocate the Portland station onto the Freight Main Line, these impacts would be even greater given the amount of time required to reverse move on/off of the Mountain Branch.
- › At-grade crossings may be needed to support the proposed development at Rock Row. It is assumed that the developer will negotiate the approval of and construct any grade crossings and automatic highway crossing warning devices with Pan Am Railways and that the associated costs will be covered by the development rather than the project. That said, it should also be noted that most of the Rock Row parcel is adjacent to an area to be double-tracked to support the proposed transit service.
- › Aside from the new station tracks to be constructed in the West Commercial Street area, the operating railroads may not allow exclusive use of the double-track sections proposed as part of this concept. Any shared use of the tracks provides potential conflicts and possible delays impacting the proposed transit service.
- › In the event that the downtown Westbrook station is constructed at the Stockhouse Restaurant rather than adjacent to the athletic field west of Main Street, the eastern limit of the proposed double-track section would be extended through the Seavey Street and Lamb Street at-grade crossings. If Pan Am Railways were to determine that the existing connection to the eastern end of Cumberland Mills needs to remain (this spur is currently out of service), this connection would be installed on the new section of double track.
- › Pan Am Railways currently maintains a waiver relieving them of the federally mandated requirement to implement Positive Train Control systems on their lines, including the portions of the Freight Main Line, Mountain Branch, and Brunswick Branch Lines where the Amtrak Downeaster currently operates. It should be noted that a Positive Train Control system has already been installed on the portion of the Amtrak Downeaster route owned by the Massachusetts Bay Transportation Authority (MBTA) and that system is currently proposed to be upgraded to provide ATC and Cab Signaling. As referenced above, the infrastructure assessment assumes that installation of ATC and Cab Signaling will be required along the proposed transit corridor given the level of service anticipated. Since the proposed transit service would run on a portion of the Pan Am Freight Main Line corridor currently subject to waiver,

it may trigger the federal requirements requiring installation of a Positive Train Control system, resulting in the installation of wayside equipment from Portland to the Massachusetts/New Hampshire border as well as retrofitting Pan Am and Amtrak locomotives with the necessary on-board components. If required, this positive train control infrastructure has a high cost and depending on the nature of the agreements reached with the host railroad, the project may be burdened with a portion, if not all, of these costs. However, it is possible that a waiver could be obtained to avoid having to implement a Positive Train Control system for the existing Amtrak Downeaster service since it would only share a short section of track with the proposed transit service. The possibility of obtaining a waiver would need to be evaluated further in a future phase of the project. Even if a waiver can be obtained to avoid having to implement a Positive Train Control system for the existing Amtrak Downeaster service, a Positive Train Control system would still likely be required for the Westbrook to Portland transit service due to the proposed frequency.

5

Preliminary Operating Plan

Two preliminary operating plans were developed in order to provide a low-end and high-end price point to bracket the cost for operating the service.

The first operating plan, which would consist of 60-minute peak service, represents the lower cost operating alternative. The second operating plan represents the higher cost alternative to providing service, consisting of 30-minute peak service.

Both of the operating plans propose service everyday (weekdays and weekends) from 5:00 AM to 11:00 PM. The first plan would provide 60-minute service all day while the second plan would propose 30-minute peak service during the following time periods:

- 7:00 to 9:00 AM and 4:00 to 6:00 PM for accommodating work trips
- 6:00 to 11:00 PM to accommodate potential leisure trips destined for downtown Portland and the Rock Row development.

While ridership during the 6:00 to 11:00 PM timeframe would likely be highest on Fridays and Saturdays, the operating plan assumed this evening peak service would be run seven days a week to provide a conservative operating cost estimate. This conservative estimate would allow for the flexibility to provide more frequent midday service in lieu of peak evening service, possible late night service on Fridays and Saturdays, or to cover the cost of special event service.

The methodology for developing a potential operating schedule involved two major steps. The first step involved an operations analysis in Rail Traffic Controller (RTC), a railroad simulation program. The second step involved taking the RTC travel time outputs to develop a published schedule which includes schedule padding to allow for delays that are likely to be

encountered along the line. This second step was done because the RTC model assumes a “perfect world” scenario (i.e., all trains operate on schedule – both the Downeaster trains and this potential rail service – and that there are no freight train interactions), which is not realistic¹.

The RTC model was built based on the following assumptions:

- › Dwell times at all stations would be 40 seconds
- › The maximum authorized speed for all trains on this corridor would be 40 MPH
- › For 30-minute service with two trains, the meet-pass point would occur at the existing Portland Transportation Center
- › Amtrak Downeaster trains would use a relocated Portland Station on the Pan Am Freight Main Line
- › Schedule recovery time (to account for delays likely to be incurred along the route) would be added into the potential schedule outside the program
- › There would be a 10-minute turn at the end of each trip²

The 10-minute turn time, which excludes schedule recovery, includes the following elements:

- › Doors opening and closing;
- › Passenger alighting and boarding;
- › Engineer close-up and set-up;
- › Engineer and conductor swap and/or restroom break, and walk time from one end of the train to the other;
- › Brake testing;
- › Positive Train Control initialization; and
- › Crew briefing.

Based on the modified RTC travel times (with schedule padding), approximately 20 minutes would be needed for each one-way trip. It is important to reiterate that this operating plan may not account for all delays that may occur, including potential conflicts with existing passenger or freight service, or railroad operations coordination that may be required to allow the service to cross the Pan Am Freight Main Line. Given there is no schedule recovery time at the end of each trip, there is a possibility that a single delay event can have cascading effects on subsequent trips, particularly in the peak period. It is recommended that the proposed schedule be tested for on-time performance and if necessary, have schedule recovery time added at the end of each trip.

¹ Depending on how freight trains are dispatched once a potential service is implemented, the schedule padding built into the proposed schedule may not fully mitigate for delays created by freight train interaction.

² This assumption may be overly optimistic due to future impacts of positive train control.

5.1 Operating Plan 1 – 60 Minute Peak Service

By taking the 20-minute travel time, and adding a 10-minute recovery/layover time between trips, one vehicle should be able to complete one roundtrip in an hour.

The proposed schedule for this operating plan are included in Appendix B.

5.2 Operating Plan 2 – 30 Minute Peak Service

Similar to the first operating plan, there would be a 20-minute travel time and a 10-minute recovery/layover time between trips, allowing one vehicle to complete a single roundtrip in an hour. During the peak, two vehicles would be required to operate peak 30-minute service. During the off-peak, one vehicle is proposed to operate back and forth, resulting in 60-minute service. Under this operating plan, double track would be needed at the Portland Transportation Center to operate peak service.

The string line diagram and the proposed schedule for this operating plan are included in Appendix B.

6

Estimated Ridership

The scope of this study did not include a detailed ridership estimate. Instead, to gain an understanding of the lower limit of potential ridership, a conservative ridership estimate was prepared using readily available data. This is not intended to be a comprehensive ridership estimate and not all sources of potential ridership are included (such as the conversion of personal vehicle drivers to transit). A more comprehensive and robust ridership estimate could be completed as part of a future phase of the project.

6.1 Components of Ridership

In performing this estimate, it was assumed that ridership would come from four different sources:

- 1) Existing transit riders that currently use the Portland Metro Bus Route 4 service (which parallels the rail line) but would choose to take the train because it is quicker than the bus;
- 2) Individuals from Westbrook and outlying communities who would take the train into Portland if a service were introduced;
- 3) Amtrak Downeaster riders who transfer to the Portland Metro Bus Route 1 service at Portland Transportation Center; and
- 4) Transit trips generated from the Rock Row development

The methodology used to develop the ridership from each of these sources is discussed below.

6.1.1 Capture of Existing Bus Riders

The Portland Metro currently operates a bus route (Route 4) that runs from the Hamlet Manufactured Home Community and the Idexx Laboratories site in Westbrook to downtown Portland. This bus route roughly parallels the Mountain Branch. Service is provided every 30 minutes throughout most of the day on weekdays and Saturdays, and every 45 minutes on Sundays. This bus route directly competes with the proposed passenger rail service between the following segments:

- › Main Street Station and Rock Row Station
- › Main Street Station and West Commercial Street Station
- › Rock Row Station and West Commercial Street Station

For ridership estimation purposes, it was assumed that the potential passenger rail service would capture: 1) Some bus passengers that currently board/alight from stops near the proposed stations, and 2) Some bus passengers that would see some travel time savings by transferring to the train. The methodology used to calculate the number of passengers expected to shift their travel to the rail system are explained below.

6.1.1.1 Capture of Existing Bus Riders Near Proposed Stations

In order to perform this ridership analysis, weekday automatic passenger counter (APC) data for Route 4 provided by Portland Metro from September 1, 2018 to October 31, 2018 was used.

The following methodology was used in performing this calculation:

- › Inbound direction (to Portland):
 - Bus stops within a 10-minute walk (approximately ¼ mile) of the proposed Main Street and Rock Row stations were identified. Boardings at bus stops in these two locations were computed.
 - The distribution of alightings at each stop after the proposed Main Street and Rock Row stations were computed. These distributions were used to determine where the passengers that board around these two proposed rail stations might have gotten off.
 - For passengers determined to be alighting at one of the Rock Row bus stops, it was assumed that only 50 percent of them would take the train as some individuals may find the bus to be more convenient to their final destination.
 - For passengers determined to be alighting at a downtown Portland bus stop, it was assumed that only 50 percent of them would take the train as the rail terminus station would require approximately 15 minutes of walking to reach the downtown core (Congress Street).
- › Outbound direction (to Westbrook):
 - Bus stops within a 10-minute walk (approximately ¼ mile) of the proposed Main Street and Rock Row stations were identified. Alightings at bus stops in these two locations were computed.

- The distribution of boardings at each stop before the proposed Main Street and Rock Row stations were computed. These distributions were used to determine where the passengers that alight around these two proposed rail stations might have boarded.
- For passengers determined to be boarding at one of the downtown Portland bus stops, it was assumed that only 50 percent of them would take the train as the terminus station would require approximately 15 minutes of walking to reach the passenger rail station from the downtown core (Congress Street).
- For passengers determined to be boarding at one of Rock Row bus stops, it was assumed that only 50 percent of them would take the train as some individuals may find the bus to be more convenient to their final destination.

Table 1 shows the results of this analysis. As shown in the table the ridership capture from the bus stops surrounding the rail stations is minimal, totaling just 40 trips for a typical weekday.

Table 1 Ridership Capture near Proposed Rail Stations

	Inbound (to Portland)			Outbound (to Westbrook)		
	Existing Weekday Daily Bus Trips (Unrounded)	Mode Shift of Trips to Rail	Estimated Bus to Rail Trips (Rounded)	Existing Weekday Daily Bus Trips (Unrounded)	Mode Shift of Trips to Rail	Estimated Bus to Rail Trips (Rounded)
Trips between Main Street Station and Rock Row Station	1.8	50%	1	5.0	50%	3
Trips between Main Street Station and West Commercial Street Station	30.9	50%	15	16.9	50%	8
Trips between Rock Row Station and West Commercial Street Station	7.0	50%	3	20.9	50%	10
TOTAL			19			21

Source: Calculation with Route 4 APC data (September 1 to October 31, 2018)

6.1.1.2 Capture of Existing Bus Riders Who Transfer to Rail

While end-to-end travel times on the proposed passenger rail are shorter and more reliable than the Route 4 bus that it competes with, transit riders generally do not like to transfer unless it results in a noticeable decrease in overall travel time.

Table 2 compares the travel times on Route 4 to the time it would take to transfer and ride the train. As can be seen, the bus travel times between Rock Row and downtown Portland are very similar to rail and as such, passengers currently on the bus would likely not transfer to the train. However, when the travel times are compared between the Main Street Station and downtown Portland, it can be seen that the train is faster, and it is likely that some passengers would be willing to transfer to the train.

Table 2 Comparison of Bus and Rail Travel Times

Outbound (to Westbrook)	Route 4			Rail
Comparable Segment	AM Peak	Mid Day	PM Peak	With 5 min transfer
West Commercial Street Station to Rock Row Station	15 min	15 min	22 min	15 min
West Commercial Street Station to Main Street Station	27 min	27 min	37 min	18 min
Inbound (to Portland)	Route 4			Rail
Comparable Segment	AM Peak	Mid Day	PM Peak	With 5 min transfer
Rock Row Station to West Commercial Street Station	25 min	25 min	20 min	15 min
Main Street Station to West Commercial Street Station	38 min	38 min	33 min	18 min

Source: Rail Traffic Controller run times, Portland Metro published schedule

Notes:

1. Orange shading denotes bus travel times that are competitive with the train and would likely not see any rider transfers.
2. Green shading denotes bus travel times that are not competitive with the train and would likely see rider transfers.

In order to quantify how many riders could be captured under this scenario, the weekday automatic passenger counter data for Route 4 was again used. The following methodology was used in performing this calculation:

- › Inbound direction (to Portland):
 - The load (number of passengers on the bus) at the bus stop before the proposed Main Street Station was computed.
 - The distribution of alightings at each stop after the proposed Main Street Station was computed. These distributions were used to determine where the passengers that were already on-board the bus might have gotten off.
 - For passengers determined to be alighting at a downtown Portland bus stop, it was assumed that only 25 percent of them would transfer and take the train. This is lower than the 50 percent used in the previous analysis as some riders may be opposed to transferring and willing to accept a longer trip time in order to forego a transfer.
- › Outbound direction (to Westbrook):
 - The number of boardings at the downtown Portland bus stops was computed.
 - The distribution of alightings at each stop after the last downtown bus stop was computed. These distributions were used to determine where the passengers that boarded the bus in downtown Portland might have gotten off.
 - For passengers determined to be alighting at a stop after Main Street Station, it was assumed that only 25 percent of them would transfer and take the train.

Table 3 shows the ridership results from this analysis. As can be seen, the ridership generated from this scenario is minimal, totaling 39 trips for a typical weekday.

Table 3 Ridership Capture near Proposed Stations

	Inbound (to Portland)			Outbound (to Westbrook)		
	Existing Weekday Daily Bus Trips (Unrounded)	Assumed Percent of Trips Transferring to Rail	Estimated Transfer Trips (Rounded)	Existing Weekday Daily Bus Trips (Unrounded)	Assumed Percent of Trips Transferring to Rail	Estimated Transfer Trips (Rounded)
Transfers between bus and rail at Main Street Station	78.0	25%	20	74.0	25%	19
TOTAL			20			19

Source: Calculation with Route 4 APC data (September 1 to October 31, 2018)

6.1.2 New Riders from Westbrook and Outlying Communities

In 2007, HNTB completed the Mountain Division Report which examined the feasibility of a potential passenger rail service on the Mountain Branch between the existing Portland Transportation Center and Steep Falls, Maine. In the report, a daily ridership estimate was also presented for the service.

Since the report was published approximately ten years ago, the ridership numbers were updated using existing 2017 U.S. Census American Community Survey data. Table 4 shows estimated ridership captured by commuters heading to Portland. It should be noted that the assumed capture rate from Westbrook was adjusted up to one percent to reflect the increased likelihood of individuals to take the train given the service being proposed as part of this study (30- or 45-minute peak service) is more frequent than the hourly service that was proposed in the Mountain Division Report.

Table 4 Ridership Estimate from Westbrook and Outlying Communities

Community	Computed number of workers destined for Portland	Mountain Branch Report Estimated Rail Capture Rate	Modified Rail Capture Rate	Workers taking public transportation to Portland	Estimated number of weekday trips (Assume 2 trips per worker)
Westbrook	3,548	0.0%	1.0%	35	70
Gorham	2,396	0.5%	N/A	12	24
Windham	2,835	1.5%	N/A	43	86
Standish	1,360	2.0%	N/A	27	54
Baldwin	79	0.5%	N/A	0	0
Limington	337	0.5%	N/A	2	4
Cornish	65	0.5%	N/A	0	0
Sebago	171	2.0%	N/A	3	6
TOTAL				122	244

Source: Computations using data from Mountain Division Report and 2017 American Community Survey

6.1.3 Amtrak Downeaster Riders Destined for the Portland Peninsula

Portland Transportation Center is a major origin and destination station for the Amtrak Downeaster train service. Today, numerous Downeaster passengers at Portland use the Portland Metro Bus (Route 1) or hail a taxi/Uber/Lyft to complete their first/last mile connection.

It is likely that some of these Downeaster passengers who currently take the bus or a taxi/Uber/Lyft would be willing to shift to using the potential Westbrook to Portland passenger rail service if it were available. The challenge with estimating this ridership is there is no data available on how many riders would be willing to shift from their current mode to a potential passenger rail service. In absence of this data, the next best data would be the number of free bus transfer vouchers that are distributed by the Downeaster to its riders. Per NNEPRA, exact numbers are not available; however, it is estimated that approximately 200 vouchers are distributed per month³.

In developing a ridership estimate, it was assumed that 200 vouchers are distributed in a typical month, and that their usage is evenly distributed across 30 days in a typical month. This equates to roughly 7 additional weekday trips that could be taken on the Westbrook to Portland passenger rail service. Since this number is likely an underestimate as it does not include passengers who pay cash to transfer to the bus (since they are unaware of the free bus transfer voucher) and passengers that currently use a taxi/Uber/Lyft, these 7 trips were doubled to 14 daily trips.

³ In conversations with NNEPRA, the availability of the bus transfer voucher is not heavily advertised to passengers on the train. As such, this number is likely an underestimate of the number of Amtrak Downeaster passengers that currently transfer to the bus.

6.1.4 New Riders Associated with the Rock Row Development

The final source of ridership for the potential passenger rail service is the trips generated by the Rock Row development. Per the Traffic Impact Assessment prepared by Sebago Technics, the Rock Row development is expected to include the following uses:

- › 425,000 square feet of retail;
- › 1,080 residential dwelling units;
- › 612,000 square feet of office;
- › A 130 room hotel;
- › 37,000 square-foot cinema;
- › Recreational space to view year-round light, music, and art shows in the quarry; and
- › An 8,160-seat concert venue.

The analysis applies ITE trip generation rates to each of the uses above to estimate the total number of trips associated with each. The quarry shows and concert venue are excluded from the trip generation for the purposes of the ridership estimate, but would likely result in additional transit trips. The retail, residential, office, hotel, and cinema uses together are projected to result in 29,804 new daily trips (assuming no internal capture). Of these, an estimated 20 percent of residential and office trips, and 0 percent of retail, hotel, and cinema trips, are projected to use transit. This results in an estimated 2,407 transit trips per day, or approximately 8.1 percent of the total number of project-generated trips.

Since the Rock Row development will serve as a future transfer location for Portland Metro's bus network, it is expected that the transit trips will be split between the proposed passenger rail service and the local buses. For purposes of this analysis, it was assumed that 75 percent of the anticipated transit trips would be captured on the passenger rail service while the remaining 25 percent would be captured on local buses. This results in a projected 1,806 trips per day associated with Rock Row using the rail service, or approximately 6.1 percent of the total number of project-generated trips. Table 5 shows the ridership calculations that were performed to generate that number.

Table 5 Ridership Estimate from Rock Row Development

Anticipated Weekday Trips for Full Build (All Modes)	Percent Transit Mode Share	Computed Weekday Transit Trips	Assumed Rail Capture Rate	Computed Weekday Transit Trips on Rail
29,804	8.1%	2,407	75%	1,806

Source: Computations using Rock Row development plan

6.2 Estimated Ridership

By combining the four components of ridership described previously, the estimated ridership of the potential passenger rail service was estimated at 337 weekday trips. This number was compared against a PACTS regional travel demand model ridership estimate that was generated as part of the Maine Turnpike Portland Area Mainline Needs Assessment Alternatives

Analysis Report (dated August 24, 2018)⁴. Since the PACTS model generated an estimate of 356 trips, which was higher than the 337 trips that was computed, 356 trips was used as the baseline ridership for the potential passenger rail service.

As shown in Table 6 below **Error! Reference source not found.**, with the full build out of Rock Row added in, the total potential ridership for the potential passenger rail service would be 2,162 weekday trips.

Table 6 Combined Ridership Estimate

Ridership Components	Average Weekday Ridership
PACTS Model Ridership Estimate	356
Rock Row Full Build Ridership	1,806
TOTAL	2,162

It should be noted that this ridership estimate is not comprehensive and excludes ridership that could be captured from sources that could not easily be quantified, including:

- › Trips generated by Thompson’s Point, including projects currently under construction (Hotel Portland and the Children’s Museum & Theatre of Maine)
- › Additional transfer trips from the Amtrak Downeaster should the Downeaster station be relocated from the Portland Transportation Center to the Pan Am Freight Main Line (ridership on the Downeaster is expected to increase due to a reduction in travel time)
- › Additional transfer trips if the Amtrak Downeaster introduces a sixth daily round trip
- › Trips that could be captured by two major employers, Mercy Hospital and Maine Medical Center, if the Portland station is relocated to the Pan Am Freight Main Line
- › Trips that potentially could be captured if Rock Row advertises and provides parking for Park and Riders destined for downtown Portland
- › Trips that may be taken by cruise ship passengers and other tourists visiting the area
- › Trips that may be taken to connect to intercity bus services at the Portland Transportation Center
- › Trips to special events at Rock Row, including the concert venue and the year-round light, music, and art show in the quarry
- › Trips by personal vehicle drivers that may switch to using the new passenger rail service if it were provided

A more comprehensive and robust ridership estimate for this service could be developed in a future phase of the project.

⁴ The PACTS model run examined the same rail corridor as this study, including the same peak frequency of 30 minutes.

7

Estimated Costs

7.1 Estimated Capital Costs

7.1.1 Infrastructure Costs

Infrastructure costs have been estimated at a conceptual level for the potential service with the recommended station configuration (West Commercial Street/Commercial Street Station and Main Street Station Option A) and are shown in Table 7 below. Separate infrastructure costs were not estimated for the two different operation plans as the maximum amount of double tracking that is reasonably feasible was provided in the proposed infrastructure to allow for maximum operational flexibility.

These costs generally include the anticipated track and signal upgrades, grade crossing improvements, bridge construction, culvert replacements, and station construction. At the two terminus stations the station costs include station platforms, parking areas, and other miscellaneous site improvements. At the PTC station, the station costs include construction of a second platform and an up-and-over access between the existing platform and proposed second platform. At the Rock Row development station, the station costs only include the cost of the two platforms as other site improvements are assumed to be included as part of the development itself. Property easement/acquisition costs are not included in the estimate below due to the conceptual level of the estimate. Property easement/acquisition costs will likely be incurred along West Commercial Street/Commercial Street.

Table 7 Conceptual Cost Estimate – Downtown Westbrook to Casco Bay Bridge

Work Element	Conceptual Cost Estimate
Track Construction and Improvements	\$7,420,000
Turnouts	\$1,900,000
Grade Crossing Improvements	\$4,040,000
Culvert Improvements	\$400,000
Overhead Bridge and Approach Construction	\$12,000,000
Communications & Signal System Improvements	\$11,640,000
Westbrook Main Street Station and Platforms	\$3,500,000
Rock Row Station Platforms	\$3,000,000
PTC Station Platform and Up-and-Over Access	\$4,600,000
Commercial Street Station and Platforms	\$2,300,000
Misc. Items and Contingency	\$13,500,000
Design, Permitting and Construction Engineering	\$6,500,000
Total Conceptual Cost Estimate, Say	\$70,800,000

See Appendix E for a breakdown of costs for Segment 1 (Downtown Westbrook to Rock Row), Segment 2 (Rock Row to the Relocated Portland Train Station), and Segment 3 (Relocated Portland Train Station to Casco Bay Bridge).

7.1.2 Vehicle Acquisition Costs

Based on the operating plans discussed in Section 5, two vehicles would be needed to operate 60-minute peak service (one vehicle in peak service, one vehicle as a spare) and three vehicles would be needed to operate 30-minute peak service (two vehicles in peak service, one vehicle as a spare).

Vehicle costs vary widely based on the quantity of vehicles ordered, current market conditions, and any add-ons that the ordering agency may request. While recent vehicle purchases by U.S. passenger rail agencies may not be the most reliable estimate for vehicle costs, they are the best available estimate until bids can be solicited from vehicle manufacturers. Based on the best available recent vehicle purchase data, the following costs were applied in estimating vehicle acquisition costs:

- › \$14.2 million for one diesel locomotive trainset with two coach cars
- › \$12 million for one diesel multiple unit (DMU) married pair (two cars permanently fixed together, each car costing \$6 million)

Those unit cost rates results in the following vehicle acquisition costs by operating plan and vehicle type:

- › Operating Plan 1 (60-minute peak service)
 - Diesel push-pull locomotives: \$28.4 million
 - DMUs: \$24.0 million
- › Operating Plan 2 (30-minute peak service)
 - Diesel push-pull locomotives: \$42.6 million
 - DMUs: \$36.0 million

Rather than purchase vehicles for the service, an operating agreement could potentially include vehicles supplied by the service provider. This is similar to the current operating agreement for the Amtrak Downeaster. In this scenario, the vehicle acquisition costs would be removed from the Capital Estimate. However, this scenario would increase the O&M costs as they would include the costs associated with the service provider supplying the vehicles.

7.2 Estimated Operations and Maintenance (O&M) Costs

To identify the potential costs for operating the proposed passenger rail service at this planning stage, O&M cost data from the Amtrak Downeaster was used and supplemented with O&M cost data through data from research reports where necessary. Contingencies of 10 to 25 percent were allocated for different line items where appropriate in order to account for unknowns at this early planning stage.

The O&M costs were computed using the proposed schedules shown in Appendix B. Since it is currently unknown who would operate the service if it should be implemented, two potential operating scenarios were costed out (with these two scenarios serving as the bookends for a range in the potential O&M cost):

- › A contractor operating the service (similar to the arrangement of the Amtrak Downeaster)
- › NNEPRA directly operating the service

Table 9 breaks out the cost for the two operating scenarios. The spreadsheets used to generate these computations are included in Appendix D.

Table 9 Estimated O&M Cost for Two Service Scenarios

	Estimated Annual O&M Cost
60-Minute Peak Service	\$7 to 11 million
30-Minute Peak Service	\$9 to 13 million

8

Summary

This report presents an overview of the high-level evaluation of the potential passenger rail service between the Old Port area in Portland and downtown Westbrook, along with conceptual level estimated costs for the implementation and operation and maintenance of the service.

The recommended configuration of the potential service includes high-frequency service between downtown Westbrook and the Old Port area in Portland. This service would be run from downtown Westbrook on Pan Am Railways Mountain Branch to CPF 196 in Portland. At that location, the service would switch onto Pan Am Railways Freight Main Line for a short distance to the Yard 8 Wye near Cassidy Point. The service would then proceed east, crossing under West Commercial Street at a newly constructed overhead bridge and continue to run along the north side of West Commercial Street, terminating near the Casco Bay Bridge near the Old Port area at Harbor View Memorial Park. Stations for the service would be located at Main Street in downtown Westbrook, at the Rock Row development in Westbrook, at the existing PTC in Portland, and at West Commercial Street/Commercial Street near the Casco Bay Bridge in the Old Port area of Portland.

As discussed in Section 4, there are some challenges that will need to be addressed to allow for the implementation of the proposed service. The most significant of these challenges include further coordination with Pan Am Railways, the interaction of the proposed service with the existing Amtrak Downeaster and freight trains, and acquisition of easements/property north of West Commercial Street/Commercial Street.

The next steps in further evaluating the feasibility of the service and full extent of the required infrastructure improvements include coordination with the project stakeholders including

NNEPRA, Waterstone Properties Group, and the Cities of Portland and Westbrook to finalize the preferred operating plan, interaction with existing transit services, station locations, and other aspects of the project as well as further coordination with Pan Am Railways to solicit approval and support for the project.

Appendix A – Selected Site Photos



**Photo 1 – Harbor View Memorial Park Looking West to Casco Bay Bridge –
Potential West Commercial Street Station Area**



**Photo 2 – Harbor View Memorial Park Looking East under Casco Bay Bridge –
Potential West Commercial St. Station Area**



**Photo 3 – Harbor View Memorial Park –
Potential West Commercial Street Station Area**



Photo 4 – Existing Railroad Tunnel Under York Street



**Photo 5 – Grade Crossing at Cassidy Point Road –
Looking to West Commercial Street**



Photo 6 – Existing Tracks South of West Commercial Street – Looking to IMT



Photo 7 – Pan Am Railways Freight Main Line – CPF 196



Photo 8 – Pan Am Railways Mountain Branch – Fore River Parkway OH Bridge



Photo 9 – Pan Am Railways Mountain Branch – Amtrak Siding Approaching PTC



Photo 10 – Pan Am Railways Mountain Branch – Existing Train Station at PTC

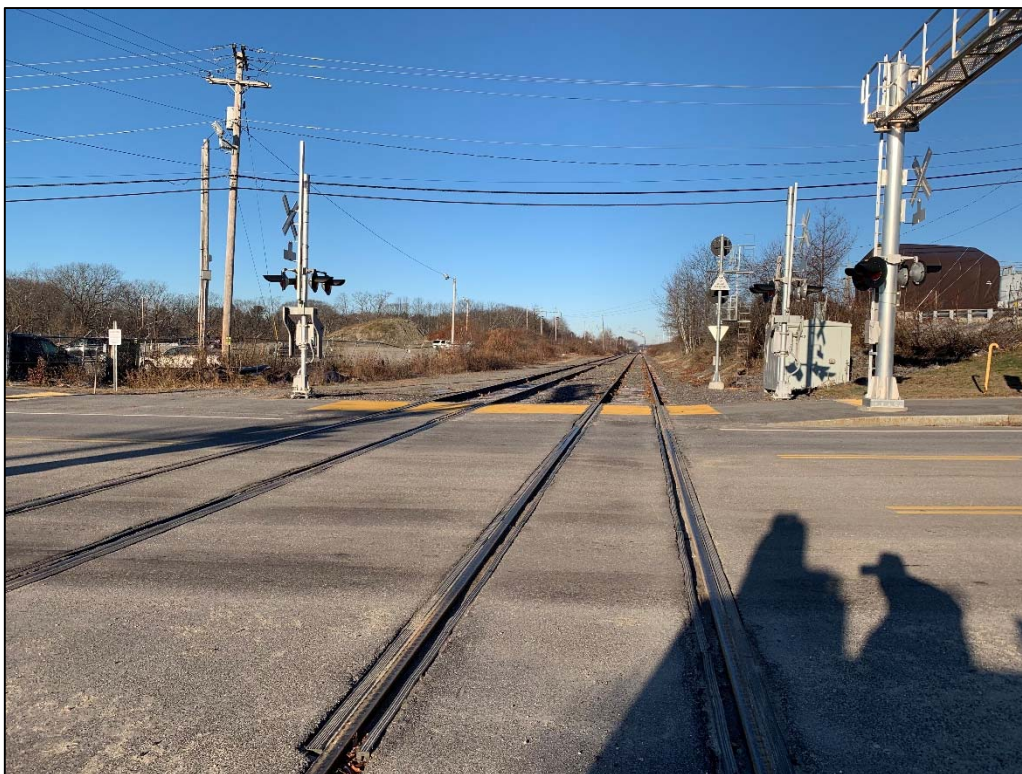
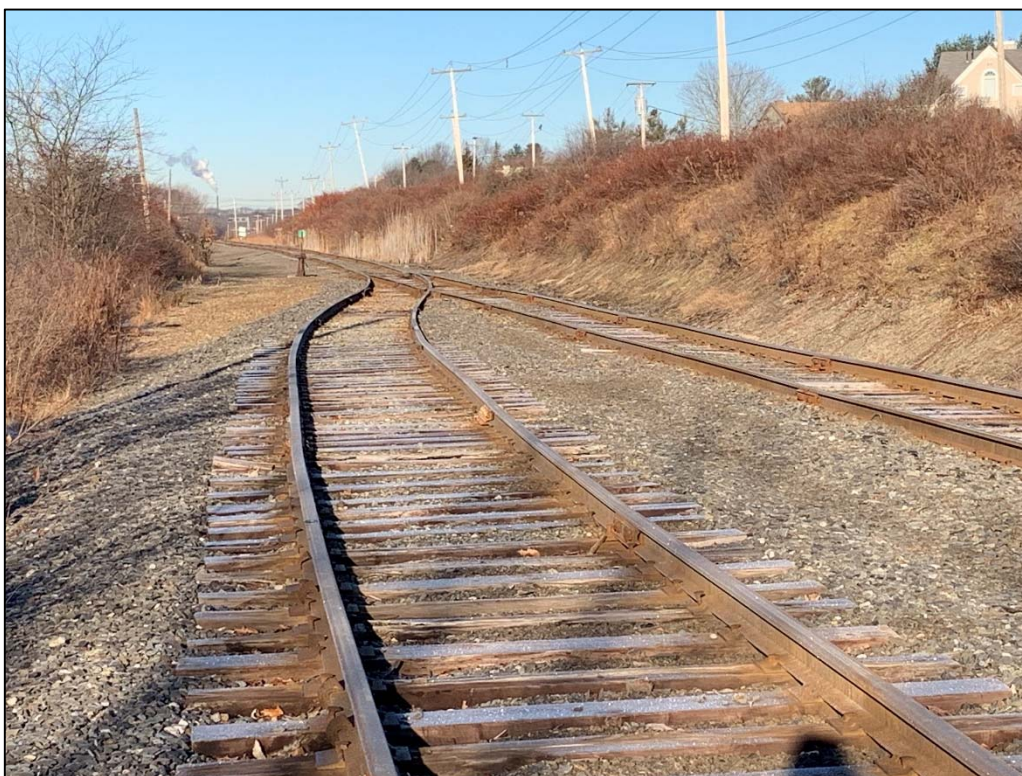


Photo 11– Pan Am Railways Mountain Branch – Thompsons Point Grade Crossing



**Photo 12 – Pan Am Railways Mountain Branch –
CPM 2 (Start of Cumberland Mills Running Track)**



**Photo 13 – Pan Am Railways Mountain Branch –
Outer Congress Street Grade Crossing**



Photo 14 – Pan Am Railways Mountain Branch – Frost Road Grade Crossing



Photo 15 – Pan Am Railways Mountain Branch – Existing Tracks near MP 3.3



Photo 16 – Pan Am Railways Mountain Branch – Rand Road Grade Crossing



**Photo 17 – Pan Am Railways Mountain Branch –
Existing Tracks near Rock Row Development and Interstate 95 Overhead**



Photo 18 – Pan Am Railways Mountain Branch – Larrabee Road Grade Crossing



**Photo 19 – Pan Am Railways Mountain Branch –
Existing Tracks near Dead River Propane Siding at MP 4.9**



Photo 20 – Pan Am Railways Mountain Branch – Forest Street Grade Crossing



Photo 21 – Pan Am Railways Mountain Branch – Lamb Street Grade Crossing



Photo 22 – Pan Am Railways Mountain Branch – Seavey Street Grade Crossing

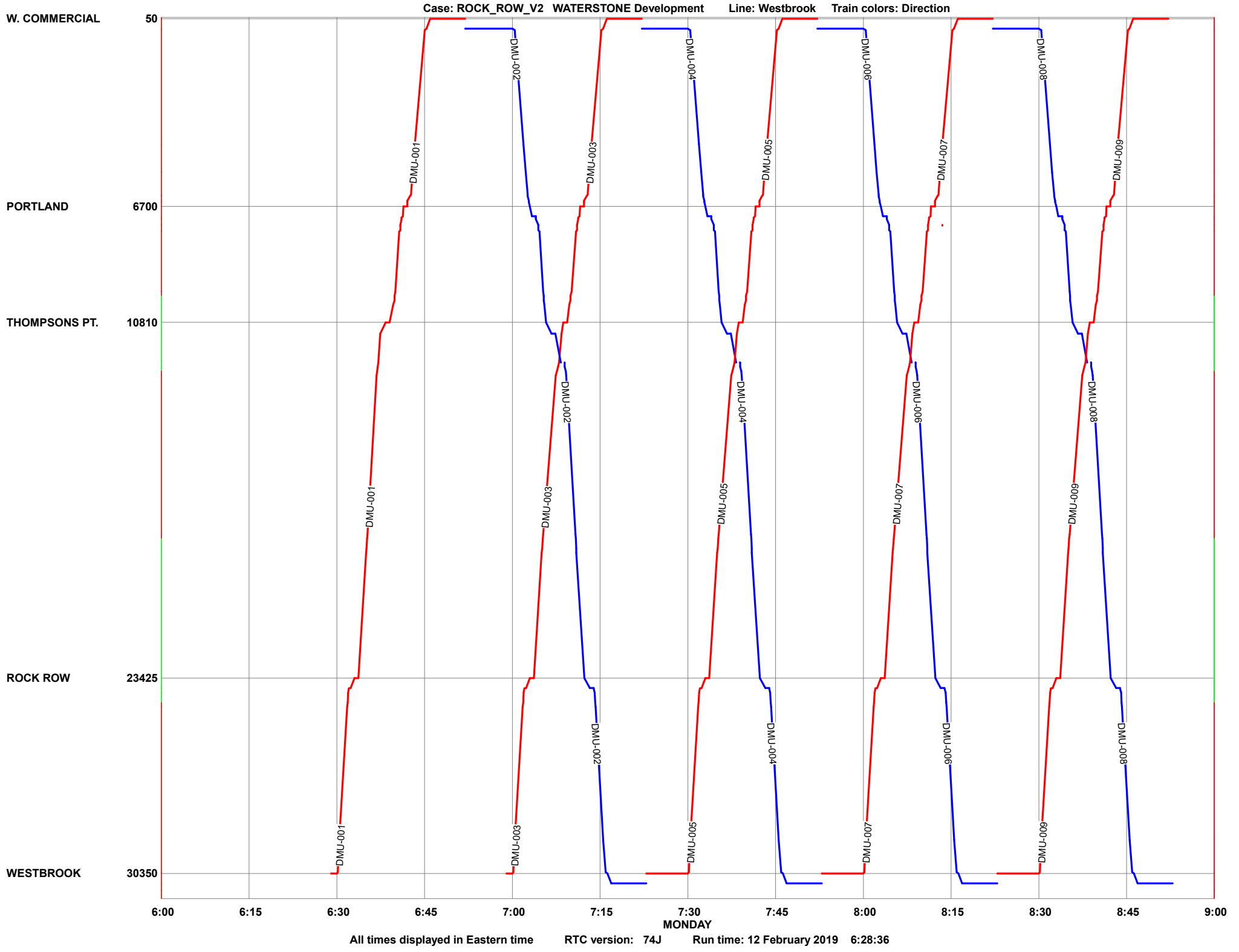


**Photo 23 – Pan Am Railways Mountain Branch –
Potential Platform Location at Stockhouse Restraunt**












**Photo 24 – Pan Am Railways Mountain Branch – Main Street Grade Crossing
Looking to Potential Platform Location North of Grade Crossing**






Appendix B – String Lines and Proposed Schedules for Service Alternatives







Westbrook to Portland Proposed Schedule - 30 Minute Peak Service





	Southbound	100	680 (SB)	102	104	200	106	682 (SB)	202	108	110	112	681 (NB)	684 (SB)	114	116	118	686 (SB)
	Westbrook:	5:00		6:00	7:00	7:30	8:00		8:30	9:00	10:00	11:00			12:00	13:00	14:00	
	Rock Row:	5:02		6:02	7:02	7:32	8:02		8:32	9:02	10:02	11:02			12:02	13:02	14:02	
	Portland Transportation Center:	5:08		6:08	7:08	7:38	8:08		8:38	9:08	10:08	11:08			12:08	13:08	14:08	
	Portland Main Line:	5:12	5:20	6:12	7:12	7:42	8:12	8:20	8:42	9:12	10:12	11:12	11:40	12:00	12:12	13:12	14:12	14:20
	W. Commercial:	5:20	to Boston	6:20	7:20	7:50	8:20	to Boston	8:50	9:20	10:20	11:20	to Bruns.	to Boston	12:20	13:20	14:20	to Boston






	Southbound	120	683 (NB)	122	204	124	206	126	688 (SB)	208	128	685 (NB)	210	130	212	687 (NB)	132	214	134
	Westbrook:	15:00		16:00	16:30	17:00	17:30	18:00		18:30	19:00		19:30	20:00	20:30		21:00	21:30	22:00
	Rock Row:	15:02		16:02	16:32	17:02	17:32	18:02		18:32	19:02		19:32	20:02	20:32		21:02	21:32	22:02
	Portland Transportation Center:	15:08		16:08	16:38	17:08	17:38	18:08		18:38	19:08		19:38	20:08	20:38		21:08	21:38	22:08
	Portland Main Line:	15:12	15:40	16:12	16:42	17:12	17:42	18:12	18:15	18:42	19:12	19:30	19:42	20:12	20:42	20:55	21:12	21:42	22:12
	W. Commercial:	15:20	to Bruns.	16:20	16:50	17:20	17:50	18:20	to Boston	18:50	19:20	to Bruns.	19:50	20:20	20:50	to Bruns.	21:20	21:50	22:20





	Northbound	680 (SB)	101	103	105	201	682 (SB)	107	203	109	111	113	681 (NB)	684 (SB)	115	117	686 (SB)	119
	W. Commercial:		5:30	6:30	7:30	8:00		8:30	9:00	9:30	10:30	11:30			12:30	13:30		14:30
	Portland Main Line:	5:20	5:34	6:34	7:34	8:04	8:20	8:34	9:04	9:34	10:34	11:34	11:40	12:00	12:34	13:34	14:20	14:34
	Portland Transportation Center:		5:37	6:37	7:38	8:08		8:38	9:08	9:37	10:37	11:37			12:37	13:37		14:37
	Rock Row:		5:42	6:42	7:44	8:14		8:44	9:14	9:42	10:42	11:42			12:42	13:42		14:42
	Westbrook:	to Boston	5:50	6:50	7:50	8:20	to Boston	8:50	9:20	9:50	10:50	11:50	to Bruns.	to Boston	12:50	13:50	to Boston	14:50






	Northbound	121	683 (NB)	123	205	125	207	688 (SB)	127	209	685 (NB)	129	211	131	687 (NB)	213	133	215	135
	W. Commercial:	15:30		16:30	17:00	17:30	18:00		18:30	19:00		19:30	20:00	20:30		21:00	21:30	22:00	22:30
	Portland Main Line:	15:34	15:40	16:34	17:04	17:34	18:04	18:15	18:34	19:04	19:30	19:34	20:04	20:34	20:55	21:04	21:34	22:04	22:34
	Portland Transportation Center:	15:37		16:38	17:08	17:38	18:08		18:38	19:08		19:38	20:08	20:38		21:08	21:38	22:08	22:38
	Rock Row:	15:42		16:44	17:14	17:44	18:14		18:44	19:14		19:44	20:14	20:44		21:14	21:44	22:14	22:44
	Westbrook:	15:50	to Bruns.	16:50	17:20	17:50	18:20	to Boston	18:50	19:20	to Bruns.	19:50	20:20	20:50	to Bruns.	21:20	21:50	22:20	22:50

Westbrook to Portland Proposed Schedule - 60 Minute Peak Service

Southbound	100	680 (SB)	102	104	106	682 (SB)	108	110	112	681 (NB)	684 (SB)	114	116
Westbrook:	5:00		6:00	7:00	8:00		9:00	10:00	11:00			12:00	13:00
Rock Row:	5:02		6:02	7:02	8:02		9:02	10:02	11:02			12:02	13:02
Portland Transportation Center:	5:08		6:08	7:08	8:08		9:08	10:08	11:08			12:08	13:08
Portland Main Line:	5:12	5:20	6:12	7:12	8:12	8:20	9:12	10:12	11:12	11:40	12:00	12:12	13:12
W. Commercial:	5:20	to Boston	6:20	7:20	8:20	to Boston	9:20	10:20	11:20	to Bruns.	to Boston	12:20	13:20

Southbound	118	686 (SB)	120	683 (NB)	122	124	126	688 (SB)	128	685 (NB)	130	687 (NB)	132	134
Westbrook:	14:00		15:00		16:00	17:00	18:00		19:00		20:00		21:00	22:00
Rock Row:	14:02		15:02		16:02	17:02	18:02		19:02		20:02		21:02	22:02
Portland Transportation Center:	14:08		15:08		16:08	17:08	18:08		19:08		20:08		21:08	22:08
Portland Main Line:	14:12	14:20	15:12	15:40	16:12	17:12	18:12	18:15	19:12	19:30	20:12	20:55	21:12	22:12
W. Commercial:	14:20	to Boston	15:20	to Bruns.	16:20	17:20	18:20	to Boston	19:20	to Bruns.	20:20	to Bruns.	21:20	22:20

Northbound	680 (SB)	101	103	105	682 (SB)	107	109	111	113	681 (NB)	684 (SB)	115	117
W. Commercial:		5:30	6:30	7:30		8:30	9:30	10:30	11:30			12:30	13:30
Portland Main Line:	5:20	5:34	6:34	7:34	8:20	8:34	9:34	10:34	11:34	11:40	12:00	12:34	13:34
Portland Transportation Center:		5:37	6:37	7:37		8:37	9:37	10:37	11:37			12:37	13:37
Rock Row:		5:42	6:42	7:42		8:42	9:42	10:42	11:42			12:42	13:42
Westbrook:	to Boston	5:50	6:50	7:50	to Boston	8:50	9:50	10:50	11:50	to Bruns.	to Boston	12:50	13:50

Northbound	686 (SB)	119	121	683 (NB)	123	125	688 (SB)	127	685 (NB)	129	131	687 (NB)	133	135
W. Commercial:		14:30	15:30		16:30	17:30		18:30		19:30	20:30		21:30	22:30
Portland Main Line:	14:20	14:34	15:34	15:40	16:34	17:34	18:15	18:34	19:30	19:34	20:34	20:55	21:34	22:34
Portland Transportation Center:		14:37	15:37		16:37	17:37		18:37		19:37	20:37		21:37	22:37
Rock Row:		14:42	15:42		16:42	17:42		18:42		19:42	20:42		21:42	22:42
Westbrook:	to Boston	14:50	15:50	to Bruns.	16:50	17:50	to Boston	18:50	to Bruns.	19:50	20:50	to Bruns.	21:50	22:50

Appendix C – Conceptual Plans



00 Southborough Drive

Suite 105B

South Portland, ME 04106

07.889.3150

Westbrook to Portland Conceptual Rail Transit Study

75 West Commercial Street, Suite 104
Portland, Maine 04101

[illegible]

Designed by	DTW	Checked by	TSB
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Issued for _____ Date **June 25, 2019**

Not Approved for Construction

Westbrook to Portland Route Map

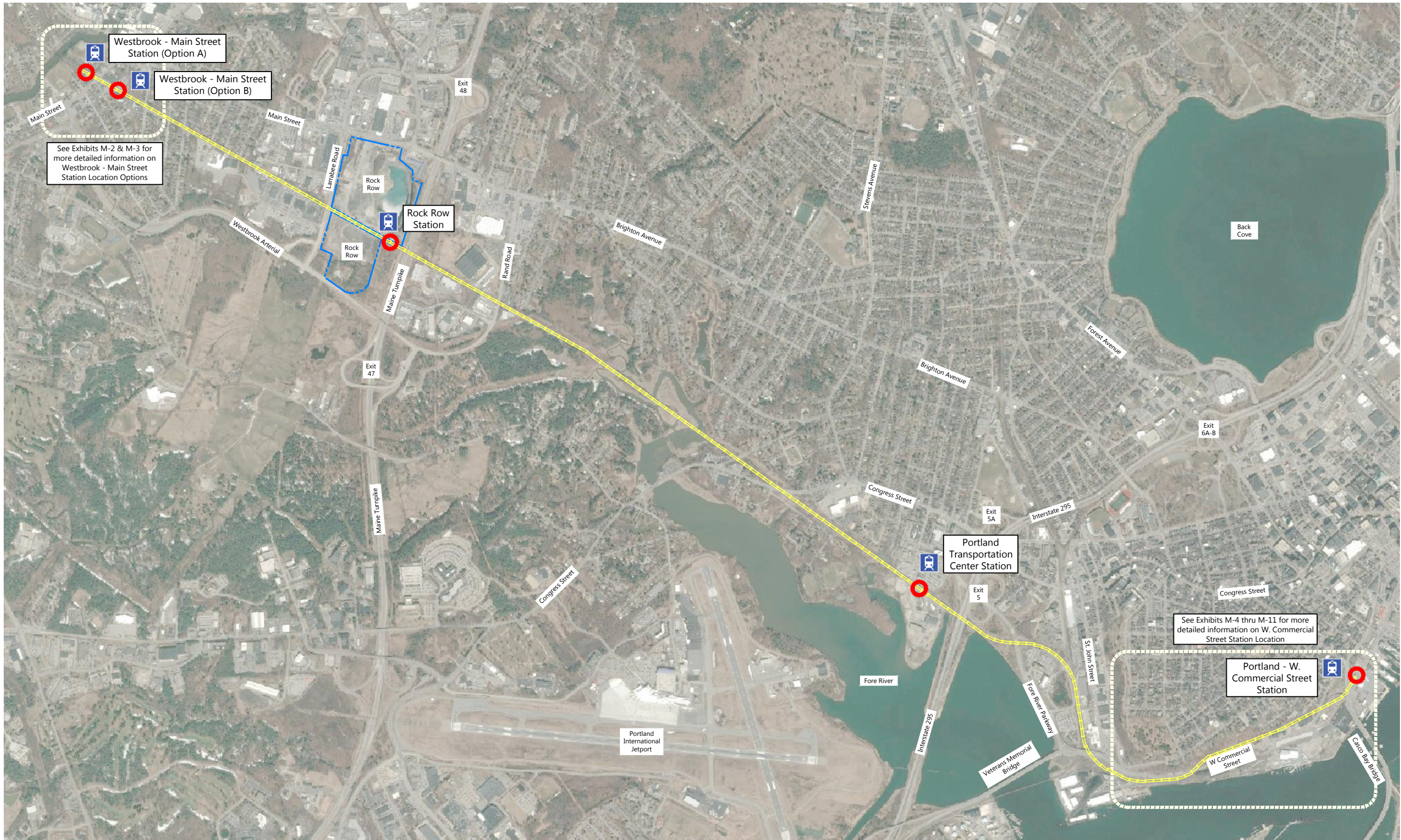
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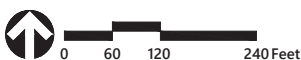
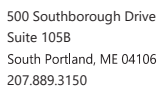
M-1

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Subject Number

5095.08





Owner	Physical Address		
1) City of Westbrook 2 York Street Westbrook, ME +/- 4.92 AC	2 Stevens Avenue	20) Direnzo Rentals LLC 56 Seavey Street Westbrook, ME +/- 0.26 AC	57 Seavey Street
2) City of Westbrook 2 York Street Westbrook, ME +/- 11.21 AC	489 Main Street	21) Direnzo Rentals LLC 56 Rochester Street Westbrook, ME +/- 0.64 AC	71 Seavey Street
3) 529 Main Street LLC 295 Brown Street, Suite 1 Westbrook, ME +/- 0.59 AC	529 Main Street	22) Stockhouse Station LLC P.O. Box 17536 Portland, ME +/- 2.64 AC	506 Main Street
4) Imad Al Saedi 23 Locust Street Westbrook, ME +/- 0.12 AC	23 Locust Street	23) Mesele Tafere 378 Park Avenue Portland, ME +/- 0.20 AC	502 Main Street
5) Richard MacLaughlin 40 Baker Mountain Drive Windham, ME +/- 0.31 AC	19 Locust Street	24) Cristina McBreairty 20 Rainbow Lane Gorham, ME +/- 0.29 AC	14 Tramway Lane
6) Samuel Harmon 15 Locust Street, Apt. #2 Westbrook, ME +/- 0.11 AC	15 Locust Street	25) Frank Logan 16 Wards Pond Road Limaington, ME +/- 0.10 AC	24 Tramway Lane
7) Southern Maine Property Management LLC 1137 Main Street Sanford, ME +/- 0.19 AC	547 Main Street	26) Ryan York 260 Conant Drive Westbrook, ME +/- 0.34 AC	492 Main Street
8) Jancar Properties LLC 543 Main Street Westbrook, ME +/- 0.19 AC	543 Main Street	27) Guay Ventures LLC 5 Forest Road Alfred, ME +/- 0.04 AC	474 Main Street
9) Li-Fang Ying 343 Blackstrap Road Falmouth, ME +/- 0.24 AC	537 Main Street	28) Guay Ventures LLC 5 Forest Road Alfred, ME +/- 0.17 AC	474 Main Street
10) Direnzo Rentals LLC 56 Rochester Street Westbrook, ME +/- 0.20 AC	517 Main Street	29) Ruben Flores Lopez 107 Pennell Avenue Portland, ME +/- 0.25 AC	468 Main Street
11) 511 Main Street LLC 1166 Methodist Road Westbrook, ME +/- 0.36 AC	511 Main Street	30) Arlene L Briggs 6523 Kessler Avenue Woodlands Hills, CA +/- 0.09 AC	464 Main Street
12) Mary Wescott 499-501 Main Street Westbrook, ME +/- 0.14 AC	499 Main Street	31) Viola V Carr 6523 Kessler Avenue Woodlands Hills, CA +/- 0.22 AC	462 Main Street
13) Orr Realty Group LLC 528 Main Street Westbrook, ME +/- 0.11 AC	528 Main Street	32) Sandra F Smith P.O. Box 10967 Portland, ME +/- 0.22 AC	458 Main Street
14) Robert G. Eaton P.O. Box 437 Westbrook, ME +/- 0.22 AC	12 Rochester Street	33) Sappi North America Inc. 89 Cumberland Street Westbrook, ME +/- 1.62 AC	Seavey Street
15) Peter A Leveque TTEES P.O. Box 395 Westbrook, ME +/- 1.68 AC	14 Rochester Street	34) Hanna Realty Associates LLC P.O. Box 1120 Portland, ME +/- 0.87 AC	434-448 Main Street
16) Maine Dovetail Inc. 36 Rochester Street Westbrook, ME +/- 0.32 AC	36 Rochester Street	35) Direnzo Rentals LLC 56 Rochester Street Westbrook, ME +/- 0.34 AC	54 Rochester Street
17) Matty Direnzo 56 Rochester Street Westbrook, ME +/- 1.79 AC	Seavey Street	36) Direnzo & Sons Company 56 Rochester Street Westbrook, ME +/- 0.34 AC	56 Rochester Street
18) Andrew C. Anderson, Jr. 53 Seavey Street Westbrook, ME +/- 0.36 AC	53 Seavey Street	37) Direnzo & Sons Company 56 Rochester Street Westbrook, ME +/- 0.34 AC	58 Rochester Street
19) Andrew C. Anderson, Jr. 290 Osgood Street Portland, ME +/- 0.16 AC	55 Seavey Street	38) Direnzo Rentals LLC 56 Rochester Street Westbrook, ME +/- 0.17 AC	60 Rochester Street
		39) Direnzo Rentals LLC 56 Rochester Street Westbrook, ME +/- 0.34 AC	78 Rochester Street

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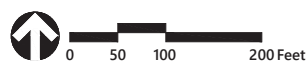
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Project Number
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Owner

1)	Mercy Hospital 144 State Street Portland, ME +/- 4.29 AC	175 Fore River Parkway
2)	Portland Terminal Co. Iron Horse Park Billerica, MA +/- 0.83 AC	50 St. John Street
3)	Portland Terminal Co. Iron Horse Park Billerica, MA +/- 0.35 AC	50 St. John Street
4)	Sprague Operating Resources 185 International Drive Portsmouth, NH +/- 25.74 AC	92 Cassidy Point Drive
5)	P&D Real Corp. 34 Whistler Landing Scarborough, ME +/- 0.58 AC	121 Cassidy Point Drive
6)	Portland Water District 225 Douglass Street Portland, ME +/- 0.009 AC	59 Cassidy Point Drive
7)	Central Maine Power Co. One City Center, 5 th Floor Portland, ME +/- 0.47 AC	133 Cassidy Point Drive
8)	Portland Terminal Co. Iron Horse Park Billerica, MA +/- 0.56 AC	287 W. Commercial Street
9)	Cianbro Corporation P.O. Box 1000 Pittsfield, ME +/- 1.16 AC	60 Cassidy Point Drive
10)	Cianbro Corporation P.O. Box 1000 Pittsfield, ME +/- 2.36 AC	34 Cassidy Point Drive
11)	Canal Landing LLC 400 W. Commercial Street Portland, ME +/- 5.98 AC	232 W. Commercial Street
12)	State of Maine 16 State House Station Augusta, ME	
13)	J.B Brown & Sons P.O. Box 207 Portland, ME +/- 10.5 AC	113 W. Commercial Street
14)	501 Danforth LLC 501 Danforth Street Portland, ME +/- 1.25 AC	501 Danforth Street
15)	481 Danforth Street LLC 481 Danforth Street Portland, ME +/- 0.15 AC	481 Danforth Street
16)	City of Portland 389 Congress Street Portland, ME +/- 0.35 AC	471 Danforth Street
17)	City of Portland 389 Congress Street Portland, ME +/- 0.55 AC	54 Western Promenade
18)	Katherine & William Marshall 467 Danforth Street Portland, ME +/- 0.13 AC	467 Danforth Street
19)	Eric & Angela Dexter 52 Western Promenade Portland, ME +/- 0.05 AC	0 Western Promenade
20)	David Fenton 50 Western Promenade Portland, ME +/- 0.15 AC	50 Western Promenade
21)	Reeven Elfman & Lisa McIlwain 48 Western Promenade Portland, ME +/- 0.14 AC	48 Western Promenade
22)	Eric & Angela Dexter 52 Western Promenade Portland, ME +/- 0.12 AC	52 Western Promenade

75 West Commercial Street, Suite 104
Portland, Maine 04101

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Not Approved for Construction

Drawing Title

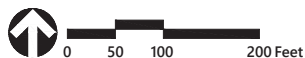
**Property Owner Map
W. Commerical Street
Portland, ME**

Drawing Number

M-4

Sheet of

Project Number
55095.08



Owner

- 1) Carol & Thomas Zack
46 Western Promenade
Portland, ME
+/- 0.14 AC
- 2) City of Portland
389 Congress Street
Portland, ME
+/- 0.27 AC
- 3) J B Brown & Sons
P.O. Box 207
Portland, ME
+/- 10.5 AC
- 4) William & Mary Duggan
420 Danforth Street
Portland, ME
+/- 1.60 AC
- 5) Marjorie Shaw
400 Danforth Street
Portland, ME
+/- 0.49 AC
- 6) Foreview LLC
380 Danforth Street
Portland, ME
+/- 0.23 AC
- 7) Marjorie Shaw
400 Danforth Street
Portland, ME
+/- 0.16 AC
- 8) Sean Murphy & Colleen
Katana
394 Danforth Street
Portland, ME
+/- 0.16 AC
- 9) Foreview LLC
380 Danforth Street
Portland, ME
+/- 1.16 AC
- 10) Andrew Butcher & Julie
Pezzano
380 Danforth Street
Portland, ME
+/- 0.27 AC
- 11) Deborah Kruk
370 Danforth Street
Portland, ME
+/- 0.29 AC
- 12) City of Portland
389 Congress Street
Portland, ME
+/- 0.03 AC
- 13) Canal Landing LLC
400 W. Commercial Street
Portland, ME
- 14) State of Maine
16 State House Station
Augusta, ME
- 15) Canal Landing LLC
400 W. Commercial Street
Portland, ME

Physical Address

40 Western Promenade

429 Danforth Street

113 W. Commercial Street

420 Danforth Street

404 Danforth Street

382 Danforth Street

400 Danforth Street

394 Danforth Street

382 Danforth Street

380 Danforth Street

370 Danforth Street

183 W. Commercial Street (Rear)

75 West Commercial Street, Suite 104
Portland, Maine 04101

Designed by	DTW	Checked by	TSB
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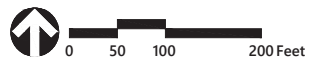
Feb. 5, 2019

Not Approved for Construction

Drawing Number

Sheet _____ of _____

Project Number
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**Westbrook to Portland
Conceptual Rail Transit
Study
NNEPRA**
75 West Commercial Street, Suite 104
Portland, Maine 04101

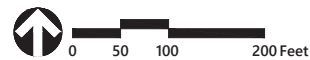
Drawing Title

Property Owner Map
W. Commercial Street
Portland, ME

M-6

Sheet _____ of _____

Project Number
55095.08



1)	State of Maine 16 State House Station Augusta, ME +/- 0.03 AC	523 Commercial Street
2)	Portland Terminal Co. Iron Horse Park N. Billerica, MA +/- 0.14 AC	513 Commercial Street
3)	Portland Terminal Co. Iron Horse Park N. Billerica, MA +/- 0.16 AC	501 Commercial Street
4)	State of Maine 2 Child Street Augusta, ME +/- 0.14 AC	493 Commercial Street
5)	State of Maine 16 State House Station Augusta, ME +/- 0.40 AC	481 Commercial Street
6)	State of Maine 16 State House Station Augusta, ME +/- 0.07 AC	469 Commercial Street
7)	Portland Terminal Co. Iron Horse Park N. Billerica, MA +/- 1.15 AC	469 Commercial Street
8)	State of Maine 16 State House Station Augusta, ME +/- 0.02 AC	14 State Street
9)	City of Portland 389 Congress Street Portland, ME +/- 1.38 AC	431 Commercial Street
10)	Brian Perkins P.O. Box 5113 Portland, ME +/- 0.11 AC	170 York Street
11)	Frank & Sharon Reilly TTES 168 York Street Portland, ME +/- 0.13 AC	168 York Street
12)	Frank & Sharon Reilly TTES 168 York Street Portland, ME +/- 0.12 AC	158 York Street
13)	Lorraine G. Harrigan 10 Boban Street York, ME +/- 0.24 AC	156 York Street

Feb. 5, 2019

Drawing Number

Sheet _____ of _____

Project Number
55095.08



00 Southborough Drive

Westbrook to Portland Conceptual Rail Transit Study

75 West Commercial Street Suite 104

No.	Revisions	Date	Approved
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NO.	REVISION	DATE	APPROV.
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Designed by	DTW	Checked by	TSB
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Issued for	Date
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June 25, 2019

Not Approved for Construction

Drawing Title

**W. Commercial Street
Connection
Portland, ME**

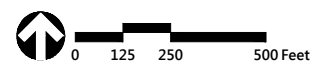
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M-8

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Project Number

5095.08





Appendix D – O&M Costs

Westbrook to Portland Operations and Maintenance Cost Estimate
60-Minute Peak Service

Proposed Service Inputs for 60-Minute Peak Service

Number of Weekday One Way Trips	36
Number of Weekend One Way Trips	36
One Way Trip Run Time with Turnaround/Recovery (Min)	30
Total Weekdays of Service in a Year	261
Total Weekends/Holidays of Service in a Year	104
One Way Revenue Miles	5.74
Track Miles (Sidings + Main Line Track)	7.02
# of Passenger Cars (coaches)	1
Total Number of Cars in Train (Assumes 1 locomotive, 1 coach cab car)	2
Total Number of Trains in Fleet (Number needed for service + 1 spare)	2
Ridership Estimate with Rock Row	2168

Calculated Service Inputs for 60-Minute Peak Service

Number of Rail Vehicles (locomotives, coaches, and coach cab cars)	4
Annual Train Revenue Hours	6,570.00
Annual Passenger Car Revenue Hours	6,570.00
Annual Train Revenue Miles	75,423.60
Annual Passenger Car Revenue Miles	75,423.60
Annual Passenger Miles (Assume all passenger ride end to end for conservative estimate)	4,542,176.80

NNEPRA Operated Service Estimated O&M Costs (Low End of Estimate)

Vehicle Operations	Unit Cost	Unit	Quantity	Approximate Cost	Allocated Contingency	Approximate Cost with Contingency
Train & Engine Crew Labor	\$ 269.00	per train revenue hour	6,570	\$ 1,767,330.00	10%	\$ 1,944,063.00
On Board Technology	\$ 50,000.00	lump sum	1	\$ 50,000.00	10%	\$ 55,000.00
Reservations & Call Centers	\$ 250,000.00	lump sum	1	\$ 250,000.00	10%	\$ 275,000.00
Regional/Local Police	\$ 132,648.00	lump sum	1	\$ 132,648.00	10%	\$ 145,912.80
Insurance	\$ 0.005	per passenger mile	4,542,176.80	\$ 22,710.88	10%	\$ 24,981.97
Performance Payment	\$ 0.01	per passenger mile	4,542,177	\$ 45,421.77	10%	\$ 49,963.94
Fuel	\$ 350,000.00	lump sum	1	\$ 350,000.00	10%	\$ 385,000.00
	\$ 4.50	per train revenue mile	75,424	\$ 339,406.20	10%	\$ 373,346.82
Subtotal:				\$ 2,957,516.85		\$ 3,253,268.54
Vehicle Maintenance						
Amtrak Capital Equipment Charge	\$ 182,197.71	per vehicle (locomotive, coach, coach cab car)	4	\$ 728,790.84	10%	\$ 801,669.92
Car & Locomotive MoE	\$ 112,082.00	per vehicle (locomotive, coach, coach cab car)	4	\$ 448,328.00	10%	\$ 493,160.80
Turnaround	\$ 1,271,000.00	lump sum	1	\$ 1,271,000.00	10%	\$ 1,398,100.00
Subtotal:				\$ 2,448,118.84		\$ 2,692,930.72
Non-Vehicle Maintenance (Use higher of 2 track maintenance costs)						
Maintenance Facility Upkeep	\$ 250,000.00	lump sum	1	\$ 250,000.00	10%	\$ 275,000.00
Assume all Track Maintenance performed by Pan Am						
Track Maintenance	\$ 2.80	per train revenue mile	75,424	\$ 211,186.08	25%	\$ 263,982.60
Track Inspection	\$ 200,000.00	lump sum	1	\$ 200,000.00	25%	\$ 250,000.00
Tie Replacement Program	\$ 7,476.64	per one way revenue mile in Pan Am territory	5.74	\$ 42,915.91	25%	\$ 53,644.89
Subtotal				\$ 454,101.99		\$ 567,627.49
Assume all Track Maintenance performed by Other Entity						
Track Maintenance and Inspection	\$ 70,029.00	per track mile	7.02	\$ 491,603.58	10%	\$ 540,763.94
Subtotal:				\$ 741,603.58		\$ 842,627.49
General Administration						
Marketing	\$ 300,000.00	lump sum	1	\$ 300,000.00	10%	\$ 330,000.00
G&A (NNEPRA)	3.30%	of operations and maintenance cost		\$ 178,385.98	10%	\$ 196,224.58
Subtotal:				\$ 478,385.98		\$ 526,224.58
Total Estimated O&M Costs:				\$ 6,625,625.25		\$ 7,315,051.33

Contractor Operated Service Estimated O&M Costs (High End of Estimate)

Vehicle Operations	Unit Cost	Unit	Quantity	Approximate Cost	Allocated Contingency	Approximate Cost with Contingency
Train & Engine Crew Labor	\$ 269.00	per train revenue hour	6,570	\$ 1,767,330.00	10%	\$ 1,944,063.00
On Board Technology	\$ 50,000.00	lump sum	1	\$ 50,000.00	10%	\$ 55,000.00
Reservations & Call Centers	\$ 250,000.00	lump sum	1	\$ 250,000.00	10%	\$ 275,000.00
Regional/Local Police	\$ 132,648.00	lump sum	1	\$ 132,648.00	10%	\$ 145,912.80
Insurance	\$ 0.005	per passenger mile	4,542,176.80	\$ 22,710.88	10%	\$ 24,981.97
Performance Payment	\$ 0.01	per passenger mile	4,542,177	\$ 45,421.77	10%	\$ 49,963.94
Fuel	\$ 350,000.00	lump sum	1	\$ 350,000.00	10%	\$ 385,000.00
	\$ 4.50	per train revenue mile	75,424	\$ 339,406.20	10%	\$ 373,346.82
Subtotal:				\$ 2,957,516.85		\$ 3,253,268.54
Vehicle Maintenance						
Amtrak Capital Equipment Charge	\$ 182,197.71	per vehicle (locomotive, coach, coach cab car)	4	\$ 728,790.84	10%	\$ 801,669.92
Car & Locomotive MoE	\$ 112,082.00	per vehicle (locomotive, coach, coach cab car)	4	\$ 448,328.00	10%	\$ 493,160.80
Turnaround	\$ 1,271,000.00	lump sum	1	\$ 1,271,000.00	10%	\$ 1,398,100.00
Subtotal:				\$ 2,448,118.84		\$ 2,692,930.72
Non-Vehicle Maintenance (Use higher of 2 track maintenance costs)						
Maintenance Facility Upkeep	\$ 250,000.00	lump sum	1	\$ 250,000.00	10%	\$ 275,000.00
Assume all Track Maintenance performed by Pan Am						
Track Maintenance	\$ 2.80	per train revenue mile	75,424	\$ 211,186.08	25%	\$ 263,982.60
Track Inspection	\$ 200,000.00	lump sum	1	\$ 200,000.00	25%	\$ 250,000.00
Tie Replacement Program	\$ 7,476.64	per one way revenue mile in Pan Am territory	5.74	\$ 42,915.91	25%	\$ 53,644.89
Subtotal				\$ 454,101.99		\$ 567,627.49
Assume all Track Maintenance performed by Other Entity						
Track Maintenance and Inspection	\$ 70,029.00	per track mile	7.02	\$ 491,603.58	10%	\$ 540,763.94
Subtotal:						\$ 1,951,018.92
General Administration						
Marketing	\$ 300,000.00	lump sum	1	\$ 300,000.00	10%	\$ 330,000.00
G&A (Contractor)	33.30%	of operations and maintenance cost		\$ 1,800,076.69	10%	\$ 1,980,084.35
Subtotal:						\$ 2,310,084.35
Total Estimated O&M Costs:				\$ 8,701,417.95		\$ 10,207,302.54

Expected Range of O&M Costs for this Alternative:	
Low End	\$ 7,315,051.33
High End	\$ 10,207,302.54
Say: \$7 to \$11 million	

Westbrook to Portland Operations and Maintenance Cost Estimate
30-Minute Peak Service

Proposed Service Inputs for 30-Minute Peak Service	
Number of Weekday One Way Trips	52
Number of Weekend One Way Trips	52
One Way Trip Run Time with Turnaround/Recovery (Min)	30
Total Weekdays of Service in a Year	261
Total Weekends/Holidays of Service in a Year	104
One Way Revenue Miles	5.74
Track Miles (Sidings + Main Line Track)	7.02
# of Passenger Cars (coaches)	1
Total Number of Cars in Train (Assumes 1 locomotive, 1 coach cab car)	2
Total Number of Trains in Fleet (Number needed for service + 1 spare)	3
Ridership Estimate with Rock Row	2168

Calculated Service Inputs for 30-Minute Peak Service	
Number of Rail Vehicles (locomotives, coaches, and coach cab cars)	6
Annual Train Revenue Hours	9,490.00
Annual Passenger Car Revenue Hours	9,490.00
Annual Train Revenue Miles	108,945.20
Annual Passenger Car Revenue Miles	108,945.20
Annual Passenger Miles (Assume all passenger ride end to end for conservative estimate)	4,542,176.80

NNEPRA Operated Service Estimated O&M Costs (Low End of Estimate)						
Vehicle Operations	Unit Cost	Unit	Quantity	Approximate Cost	Allocated Contingency	Approximate Cost with Contingency
Train & Engine Crew Labor	\$ 269.00	per train revenue hour	9,490	\$ 2,552,810.00	10%	\$ 2,808,091.00
On Board Technology	\$ 50,000.00	lump sum	1	\$ 50,000.00	10%	\$ 55,000.00
Reservations & Call Centers	\$ 250,000.00	lump sum	1	\$ 250,000.00	10%	\$ 275,000.00
Regional/Local Police	\$ 132,648.00	lump sum	1	\$ 132,648.00	10%	\$ 145,912.80
	\$ 0.005	per passenger mile	4,542,176.80	\$ 22,710.88	10%	\$ 24,981.97
Insurance	\$ 0.01	per passenger mile	4,542,177	\$ 45,421.77	10%	\$ 49,963.94
Performance Payment	\$ 350,000.00	lump sum	1	\$ 350,000.00	10%	\$ 385,000.00
Fuel	\$ 4.50	per train revenue mile	108,945	\$ 490,253.40	10%	\$ 539,278.74
Subtotal:				\$ 3,893,844.05		\$ 4,283,228.46
Vehicle Maintenance						
Amtrak Capital Equipment Charge	\$ 182,197.71	per vehicle (locomotive, coach, coach cab car)	6	\$ 1,093,186.26	10%	\$ 1,202,504.89
Car & Locomotive MoE	\$ 112,082.00	per vehicle (locomotive, coach, coach cab car)	6	\$ 672,492.00	10%	\$ 739,741.20
Turnaround	\$ 1,271,000.00	lump sum	1	\$ 1,271,000.00	10%	\$ 1,398,100.00
Subtotal:				\$ 3,036,678.26		\$ 3,340,346.09
Non-Vehicle Maintenance (Use higher of 2 track maintenance costs)						
Maintenance Facility Upkeep	\$ 250,000.00	lump sum	1	\$ 250,000.00	10%	\$ 275,000.00
Assume all Track Maintenance performed by Pan Am						
Track Maintenance	\$ 2.80	per train revenue mile	108,945	\$ 305,046.56	25%	\$ 381,308.20
Track Inspection	\$ 200,000.00	lump sum	1	\$ 200,000.00	25%	\$ 250,000.00
Tie Replacement Program	\$ 7,476.64	per one way revenue mile in Pan Am territory	5.74	\$ 42,915.91	25%	\$ 53,644.89
<i>Subtotal</i>				\$ 547,962.47		\$ 684,953.09
Assume all Track Maintenance performed by Other Entity						
Track Maintenance and Inspection	\$ 70,029.00	per track mile	7.02	\$ 491,603.58	10%	\$ 540,763.94
Subtotal:				\$ 797,962.47		\$ 959,953.09
General Administration						
Marketing	\$ 300,000.00	lump sum	1	\$ 300,000.00	10%	\$ 330,000.00
G&A (NNEPRA)	3.30%	of operations and maintenance cost		\$ 228,707.24	10%	\$ 251,577.96
Subtotal:				\$ 528,707.24		\$ 581,577.96
Total Estimated O&M Costs:				\$ 8,257,192.02		\$ 9,165,105.60

Contractor Operated Service Estimated O&M Costs (High End of Estimate)						
Vehicle Operations	Unit Cost	Unit	Quantity	Approximate Cost	Allocated Contingency	Approximate Cost with Contingency
Train & Engine Crew Labor	\$ 269.00	per train revenue hour	9,490	\$ 2,552,810.00	10%	\$ 2,808,091.00
On Board Technology	\$ 50,000.00	lump sum	1	\$ 50,000.00	10%	\$ 55,000.00
Reservations & Call Centers	\$ 250,000.00	lump sum	1	\$ 250,000.00	10%	\$ 275,000.00
Regional/Local Police	\$ 132,648.00	lump sum	1	\$ 132,648.00	10%	\$ 145,912.80
	\$ 0.005	per passenger mile	4,542,176.80	\$ 22,710.88	10%	\$ 24,981.97
Insurance	\$ 0.01	per passenger mile	4,542,177	\$ 45,421.77	10%	\$ 49,963.94
Performance Payment	\$ 350,000.00	lump sum	1	\$ 350,000.00	10%	\$ 385,000.00
Fuel	\$ 4.50	per train revenue mile	108,945	\$ 490,253.40	10%	\$ 539,278.74
Subtotal:				\$ 3,893,844.05		\$ 4,283,228.46
Vehicle Maintenance						
Amtrak Capital Equipment Charge	\$ 182,197.71	per vehicle (locomotive, coach, coach cab car)	6	\$ 1,093,186.26	10%	\$ 1,202,504.89
Car & Locomotive MoE	\$ 112,082.00	per vehicle (locomotive, coach, coach cab car)	6	\$ 672,492.00	10%	\$ 739,741.20
Turnaround	\$ 1,271,000.00	lump sum	1	\$ 1,271,000.00	10%	\$ 1,398,100.00
Subtotal:				\$ 3,036,678.26		\$ 3,340,346.09
Non-Vehicle Maintenance (Use higher of 2 track maintenance costs)						
Maintenance Facility Upkeep	\$ 250,000.00	lump sum	1	\$ 250,000.00	10%	\$ 275,000.00
Assume all Track Maintenance performed by Pan Am						
Track Maintenance	\$ 2.80	per train revenue mile	108,945	\$ 305,046.56	25%	\$ 381,308.20
Track Inspection	\$ 200,000.00	lump sum	1	\$ 200,000.00	25%	\$ 250,000.00
Tie Replacement Program	\$ 7,476.64	per one way revenue mile in Pan Am territory	5.74	\$ 42,915.91	25%	\$ 53,644.89
<i>Subtotal</i>				\$ 547,962.47		\$ 684,953.09
Assume all Track Maintenance performed by Other Entity						
Track Maintenance and Inspection	\$ 70,029.00	per track mile	7.02	\$ 491,603.58	10%	\$ 540,763.94
Subtotal:						\$ 2,185,670.12
General Administration						
Marketing	\$ 300,000.00	lump sum	1	\$ 300,000.00	10%	\$ 330,000.00
G&A (Contractor)	33.30%	of operations and maintenance cost		\$ 2,307,863.93	10%	\$ 2,538,650.32
Subtotal:						\$ 2,868,650.32
Total Estimated O&M Costs:				\$ 10,827,952.30		\$ 12,677,894.99

Expected Range of O&M Costs for this Alternative:	
Low End	\$ 9,165,105.60
High End	\$ 12,677,894.99
Say: \$9 to \$13 million	

Appendix E – Estimated Construction Costs



Project: Proposed Rail Transit: Westbrook to Commercial St
Description: Infrastructure Assessment: PAR Mountain Branch, FML and Yard Tracks to Commercial St.
Calculated By: Mike McDonough, Ian Stewardson
Checked By: Tim Bryant, Gordon Edington

Project #: 14093.00
Sheet: 1
Date: 5/6/19
Date: 5/6/19

Segment 1: Downtown Westbrook to Rock Row

ITEM	DESCRIPTION	ESTIMATED CONSTRUCTION COST
1	Track Improvements	\$ 1,330,000
2	Turnouts	\$ 910,000
3	Grade Crossing Improvements	\$ 2,200,000
4	Farm Crossing Improvements	\$ -
5	Undergrade Bridge Improvements	\$ -
6	Culvert Improvements	\$ 50,000
7	Overhead Bridge Improvements	\$ -
8	Communications & Signal System Improvements	\$ 1,960,000
9	Station Construction	\$ 3,500,000
TOTAL =		\$ 9,950,000

MISC. ITEMS (10%) = \$ 995,000
SUBTOTAL = \$ 10,945,000

CONTINGENCY (15%) = \$ 1,641,750
SUBTOTAL = \$ 12,586,750

DESIGN, PERMITTING AND CONSTRUCTION ENGINEERING (10%) = \$ 1,258,675
TOTAL = \$ 13,845,425

SAY = \$ 13,900,000



Project: Proposed Rail Transit: Westbrook to Commercial St
Description: Infrastructure Assessment: PAR Mountain Branch, FML and Yard Tracks to Commercial St.
Calculated By: Mike McDonough, Ian Stewardson
Checked By: Tim Bryant, Gordon Edington

Project #: 14093.00
Sheet: 1
Date: 5/6/19
Date: 5/6/19

Segment 2: Rock Row to Relocated Portland Transportation Center Train Station

ITEM	DESCRIPTION	ESTIMATED CONSTRUCTION COST
1	Track Improvements	\$ 4,320,000
2	Turnouts	\$ 530,000
3	Grade Crossing Improvements	\$ 1,540,000
4	Farm Crossing Improvements	\$ -
5	Undergrade Bridge Improvements	\$ -
6	Culvert Improvements	\$ 350,000
7	Overhead Bridge Improvements	\$ -
8	Communications & Signal System Improvements	\$ 7,220,000
9	Station Construction	\$ 7,600,000
TOTAL =		\$ 21,560,000

MISC. ITEMS (10%) = \$ 2,156,000
SUBTOTAL = \$ 23,716,000

CONTINGENCY (15%) = \$ 3,557,400
SUBTOTAL = \$ 27,273,400

DESIGN, PERMITTING AND CONSTRUCTION ENGINEERING (10%) = \$ 2,727,340
TOTAL = \$ 30,000,740

SAY = \$ 30,100,000



Project: Proposed Rail Transit: Westbrook to Commercial St
Description: Infrastructure Assessment: PAR Mountain Branch, FML and Yard Tracks to Commercial St.
Calculated By: Mike McDonough, Ian Stewardson
Checked By: Tim Bryant, Gordon Edington

Project #: 14093.00
Sheet: 1
Date: 5/6/19
Date: 5/6/19

Segment 3 - Relocated Portland Transportation Center Train Station to Casco Bay Bridge

ITEM	DESCRIPTION	ESTIMATED CONSTRUCTION COST
1	Track Improvements	\$ 1,770,000
2	Turnouts	\$ 460,000
3	Grade Crossing Improvements	\$ 300,000
4	Farm Crossing Improvements	\$ -
5	Undergrade Bridge Improvements	\$ -
6	Culvert Improvements	\$ -
7	Overhead Bridge Improvements	\$ 12,000,000
8	Communications & Signal System Improvements	\$ 2,460,000
9	Station Construction	\$ 2,300,000
TOTAL =		\$ 19,290,000

MISC. ITEMS (10%) = \$ 1,929,000
SUBTOTAL = \$ 21,219,000

CONTINGENCY (15%) = \$ 3,182,850
SUBTOTAL = \$ 24,401,850

DESIGN, PERMITTING AND CONSTRUCTION ENGINEERING (10%) = \$ 2,440,185
TOTAL = \$ 26,842,035

SAY = \$ 26,900,000