SUMMARY REPORT

PALMER STATION
PLANNING + DESIGN

MassDOT Palmer Station Planning & Design

Alternatives Analysis

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Introduction

Palmer, Massachusetts, nicknamed the "Town of Seven Railroads," has a history of railroad activity spanning to the 1800's. Both freight and passenger operations have served the town during this time, although passenger service was discontinued in 1971.

Recent studies conducted by the Massachusetts Department of Transportation (MassDOT) have evaluated and proposed reintroducing passenger rail service to Palmer as part of the Compass Rail vision for intercity passenger rail in Massachusetts. Compass Rail is comprised of existing and proposed West-East and North-South services with a robust hub in Springfield. It is expected that future passenger service through Palmer would be included in the proposed West-East Rail routes, which would be operated by Amtrak and would include an Inland Route between Boston and New Haven through Springfield and a Boston and Albany route. Both routes would use the Boston & Albany Line owned and operated by CSX Transportation (CSX). However, a station location in Palmer is not yet determined.

The Palmer Station Planning and Design project aims to identify the location for a new passenger rail station serving the Town of Palmer and surrounding communities as a step towards realizing the Compass Rail vision. This report describes the project background and site Alternatives Analysis approach and results.

The remainder of this chapter, **Chapter 1**, provides an overview of the Palmer Station Planning and Design project, including the project's background, the project purpose, and the goals and objectives of the project, which have been refined through stakeholder engagement. **Chapter 2** describes the site identification process, resulting in the identification of nine sites and eleven total configuration options to evaluate through the alternatives analysis. **Chapter 3** describes the Level 1 screening of the sites, which resulted in six sites advancing for further evaluation. **Chapter 4** describes that Level 2 comparative evaluation, resulting in the selection of a single site to advance to conceptual design.

Project Overview

Construction of a new rail station in Palmer, MA was considered as part of the Northern New England Intercity Rail Initiative (NNEIRI), a 2016 conceptual planning study that examined the implementation and operation of more frequent, higher-speed intercity passenger rail service on the Inland Route and the Boston-to-Montreal route. Several additional studies have been conducted since with reference to a station in Palmer, and Figure 1 provides a timeline of the previous work leading up to the current Palmer Station Planning and Design project.

Figure 1 Timeline of Previous Work (2016-2023)

2016 — Northern New England Intercity Rail Initiative (NNEIRI) Alternatives Analysis[1]
Identified 5 potential sites for Palmer Station and recommended 3 for further consideration based on engineering, resource impact, and access criteria

2017 — Palmer Transit Oriented Development Draft Conceptual Plan[2]
Examined factors that would impact transit-oriented development (TOD) in downtown Depot Village and identified 4 potential site locations within ¼ mile of the historic location

2019 — Town of Palmer and UMass Amherst – The Case for Palmer[3]
Identified strengths and opportunities for a station in Palmer in the East-West Passenger Rail Study

2021 — East – West Passenger Rail Study[4]
Included a station in Palmer in alternatives analysis; did not identify a specific site location

— Palmer Master Plan[5]
Referenced station site options in Depot Village and relevant next steps from the 2017 study

2023 — Transit Oriented Development Plan for Palmer, MA[6]
Developed a TOD plan for Palmer based on the station site options in Depot Village that were presented in the 2017 Palmer TOD Draft Conceptual Plan

Common themes from previous studies supporting a station in Palmer were synthesized to develop a draft purpose and objectives for the current Palmer Station Planning and Design project, which was further refined based on stakeholder feedback.

1 MassDOT. Northern New England Intercity Rail Initiative Alternatives Analysis Report, Appendix I, Palmer Station Analysis. January 2015.

2 Fuss & O'Neil. Palmer Transit Oriented Development Draft Conceptual Downtown Plan Progress Presentation. September 2017.

3 Town of Palmer, University of Massachusetts Amherst Center for Economic Development. Towards a Passenger Station on the East-West Massachusetts Train Line: The Case for Palmer. June 2019.

4 MassDOT. East-West Passenger Rail Study Final Report. January 2021.

5 Town of Palmer. Palmer Master Plan. August 2021.

6 Keith B. Benoit. Transit Oriented Development Plan for Palmer, MA. March 2023. Submitted in partial fulfillment of the requirements for a Masters of Regional Planning.

The purpose of this project is to identify a new passenger rail station along the proposed Compass Rail Corridor serving the Town of Palmer and surrounding communities that will enhance mobility and connectivity, support local planning goals, and drive economic development.

The goals and objectives were also based on the goals set forth in previous studies and informed by stakeholder engagement. Concerns on setting realistic expectations for the range of feasible possibilities were addressed by explicitly including the goal of minimizing freight impacts. Stakeholder feedback highlighting the large student population within the vicinity of Palmer also helped to expand on the goal of regional growth and connectivity.

The five goals and objectives of the project are to:

1. Provide and create an **intercity rail stop** on the proposed Compass Rail corridor while **meeting operational requirements** for Amtrak, CSX, and other freight operators and **minimizing freight operations impacts**;
2. **Enhance passenger mobility and connectivity** for local and regional growth and to support access to the Five College Consortium;
3. Improve local and regional **economy and livability;**
4. Support local and regional goals to **reduce dependency on auto transportation** by offering an alternative choice for travelers and providing opportunities for multimodal station access; and
5. **Avoid and minimize** social, cultural, and natural **environmental impacts**.

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Site Identification

Site identification serves as the foundation for station planning. With the help of stakeholder engagement, this initial phase establishes the range of potential sites to evaluate through an alternatives analysis to identify a preferred site for conceptual design. This chapter presents the site identification process, which involved compiling potential sites from previous work, reviewing the corridor for additional possibilities, and soliciting stakeholder feedback. It then provides an overview of the potential sites that were considered as alternatives for Palmer Station.

Although no selection had yet been made, several previous studies have examined potential sites for Palmer. As a first step in identifying potential sites for Palmer Station, a review of the sites identified in the previous studies included:

- The NNEIRI Palmer Station Analysis identified five potential sites, including the historic station location and four other sites.
- The 2017 Palmer TOD Draft Conceptual Plan considered four potential sites for the station in Depot Village located within a quarter mile of the historic station.
- An unsolicited draft site analysis for an additional alternative for Palmer Station was received from G&H Collaborators in August 2023. The potential site was presented as a supplement to the four locations addressed in the 2017 Palmer TOD Draft Conceptual Plan.

Vacant or underutilized sites along the corridor in the vicinity of Palmer were also considered using CoStar, which assessed properties adjacent to the rail line. This review identified the property type, location, and for-sale status of existing properties to determine suitability as potential sites. The CoStar assessment was accompanied by an aerial review of the corridor to identify other potential underutilized sites. No additional potential sites were identified through this review.

The first stakeholder workshop held in March 2024 aimed to solicit feedback on the initial list of sites compiled. No additional sites were suggested, but comments were received regarding parking and site access considerations. A discussion of town-owned parcels near the historic location helped to refine the sites initially identified as part of the Palmer TOD Draft Conceptual Downtown Plan.

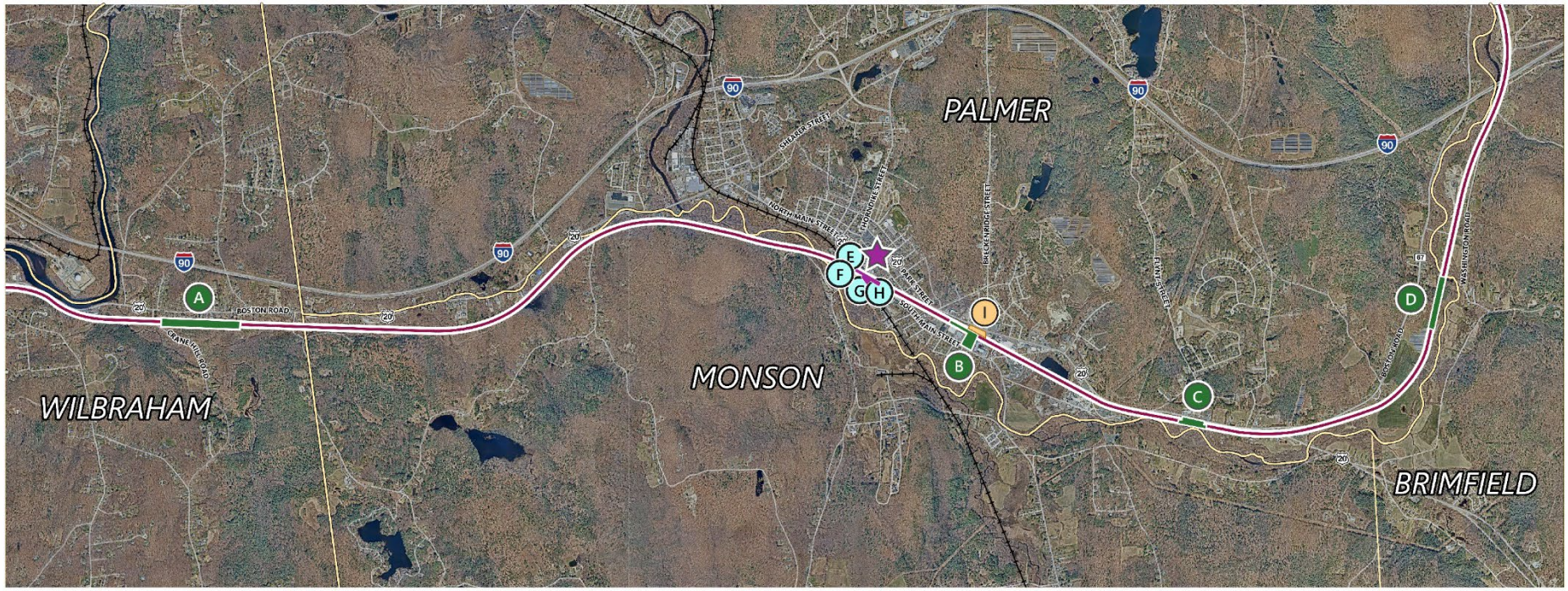
A total of nine potential sites were included in the Alternatives Analysis. Table 1 summarizes the potential sites identified. The sites are lettered chronologically based on the previous studies they initially appeared in. Sites A-D correspond to the four sites (aside from the historic location) identified in the NNEIRI Palmer Station Analysis, Sites E-H correspond to the four sites identified in the Palmer TOD Draft Conceptual Plan presentation, and Site I corresponds to the G&H Collaborators suggestion.

Table 1 Potential Sites Identified

Site	Site Name	Site Location	Additional Notes
A	East of Crane Hill Road	Between Crane Hill Road and Silver Street, Wilbraham, MA (Approximate Mileposts: 87.2-87.6)	The proposed site would be located along a section of tangent track. A specific parcel for the station facility infrastructure has not been identified.
B	South of Palmer Yard	1199 South Main Street, Palmer, MA (Approximate Mileposts: 82.5-83.1)	The proposed site would be on a parcel of land owned and partially occupied by Sanderson Macleod Inc., a local twisted wire brush manufacturer.
C	US-20, East of Nipmuck Street	1511 Park Street, Palmer, MA (Approximate Mileposts: 80.9-81.4)	Site C is located east of downtown Palmer, along the Quaboag River. The proposed site is on a parcel currently occupied by Main Street Tire & Auto, an auto repair shop.
D	Boston Road	South of Kings Bridge Road, Palmer, MA (Approximate Mileposts: 79.6-80.1)	Site D is also located east of downtown Palmer along the Quaboag River. A specific parcel for the station facility infrastructure has not been identified.
E	Palmer Redevelopment Authority (PRA) Lot	1412-1416 Main Street, Palmer, MA	The site marked in the Palmer TOD Draft Conceptual Downtown Plan (on Foundry Street and North Main Street) is occupied by several businesses, so a parcel on Main Street and Bridge Street owned by the Palmer Redevelopment Authority (PRA) and currently containing a parking lot was evaluated as Site E.
F	Palmer Department of Public Works (DPW) Lot	1013-1015 Bridge Street, Palmer, MA	The proposed site would be on a Palmer DPW lot currently partially occupied by a Palmer Highway Department building
G	Water Street Fields	8-10 Water Street, Palmer, MA	Based on stakeholder feedback, the site defined by the two town-owned parcels on Water Street, along the Quaboag River, was evaluated as Site G.
H	Historic Location	Adjacent to 28 Depot Street, Palmer, MA (Approximate Mileposts: 83.4-83.7)	The site would include the parcel partially occupied by the Steaming Tender Restaurant, and the adjacent parcel between the CSX and New England Central Railroad (NECR) corridors, currently partially occupied by a park.
I	North of Palmer Yard	1181-1189 Park Street, Palmer, MA	The two parcels are currently partially occupied by a trucking company and a seasonal restaurant.

Figure 2 provides an overview of the alternative site locations along the Compass Rail corridor, with the historic station location in Palmer marked with a star for reference, consistent with the NNEIRI naming structure.

Figure 2 Approximate Locations of Sites A-I



LEGEND

- Historic Station Location
- Potential Locations Identified in NNEIRI Palmer Station Analysis *(A, B, C, D)*
- Potential Locations Identified in Palmer Master Plan and Palmer TOD Draft Conceptual Downtown Plan *(E, F, G, H)*
- Other Potential Locations Identified *(I)*
- Town Boundary
- Proposed Compass Rail Corridor / Current Amtrak Lake Shore Limited Service Track Owned by CSX
- Other Railroad Lines

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Level 1 Fatal Flaw Screening

The Palmer Station Planning and Design project used a two-level approach to compare and evaluate each of the station site locations identified in Chapter 2. This chapter documents the Level 1 Fatal Flaw Screening, which evaluated the operational and engineering feasibility of constructing a station at each of the potential sites. The following sections describe the approach and methodology for the Level 1 Fatal Flaw Screening, and the results – including which sites meet each of the three fatal flaw screening criteria and advanced to the Level 2 Comparative Evaluation described in Chapter 4, which includes screening criteria associated with Engineering and Operations, Environment, Mobility, Economic Development Potential, and Implementation.

Approach and Methodology

The Level 1 Fatal Flaw Screening focused on operational and engineering feasibility using high-level sketches on aerial imagery. The sketches placed the essential rail infrastructure – such as turnouts to a station siding, a station siding, and a passenger platform – on the Compass Rail corridor where possible within the vicinity of each identified site. Each site was then evaluated against three fatal flaw criteria:

- **Operational Compatibility:** Is the site on the Compass Rail Corridor?
- **Track Geometry and Right-of-Way (ROW) Limits:** Does sufficient space exist to accommodate the station on a siding track with associated track and signal infrastructure meeting minimum standards?
- **Freight Operations Impacts:** Does the site interfere with the diamond junction (CP-83, between CSX and NECR) or the CSX Palmer Yard?

Each of these criteria are described in more detail in the following subsections.

Operational Compatibility

Is the site on the Compass Rail Corridor?

As stated in the project purpose, the project aims to locate Palmer Station along the Compass Rail corridor in order to optimize passenger rail travel time and to avoid operational impacts to the existing and robust freight operations. West of Worcester, the Compass Rail corridor would utilize the existing CSX right-of-way (the Boston & Albany Line). Sites not directly located adjacent to the Compass Rail corridor would need to provide a direct connection to proposed track and station infrastructure along the corridor to meet this criterion.

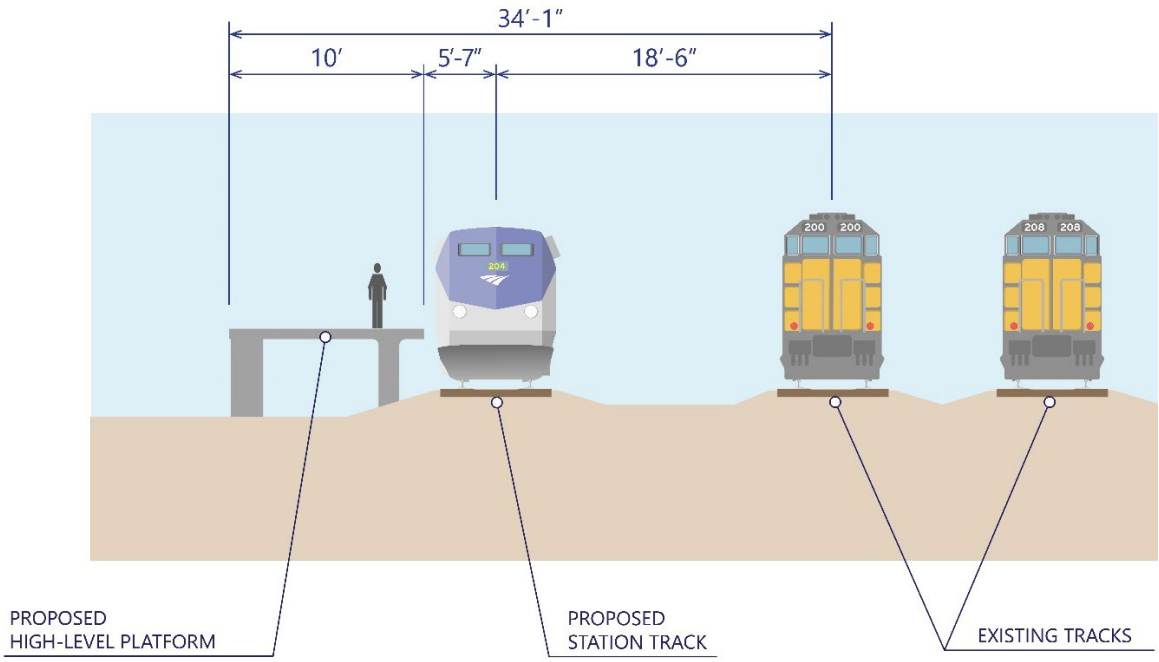
Track Geometry and Right-of-Way Limits

Does sufficient space exist within the existing ROW and proposed site to accommodate a station on a siding track with associated track and signal infrastructure meeting minimum standards?

To meet this criterion:

- The station platform must be sited on a siding track separate from the mainline (per CSX requirements). This would allow trains to stop at the station without interfering with mainline operations. This is critical because:
  - CSX, the owner of the mainline, operates up to fifteen daily trains on the CSX mainline through Palmer, which will grow to 21 daily trains in the future, with many of these trains interchanging at the Palmer Yard.
  - Although there are multiple CSX tracks in Palmer, the Boston & Albany Line operates as single track between Worcester and Wilbraham. For a passenger train to make a stop at a station on the mainline, it would occupy the mainline track for approximately two to three minutes, impacting the flow of traffic in that entire segment.
  - CSX has developed an operations model for the corridor and tested a potential stop on the mainline and has determined that a mainline stop would result in levels of delay that it considers unacceptable.
  - Due to the frequency of freight service, implications on yard operations and the modeled potential for delay, a station track is necessary so the passenger rail service does not itself experience delays nor result in significant delays to the freight rail services of the right-of-way owner, CSX.
- The siding track and station platform must meet the following minimum standards, resulting in a total of 34′-1″ from the centerline of the nearest active CSX freight track to accommodate a station siding track and platform (Figure 3):
  - Based on CSX Plan 2611 (General Arrangement at Passenger Platforms), the centerline of the station siding track must be a minimum of 18′-6″ from the centerline of the nearest active CSX freight track.
  - Amtrak Plan 70050G (Minimum Roadway Clearances) specifies that high-level platforms must be spaced a minimum of 5′-7″ from the centerline of the station siding track.
  - The Amtrak *Station Program and Planning Guidelines* state that the minimum platform width required for a side platform with passenger service only is 10′.

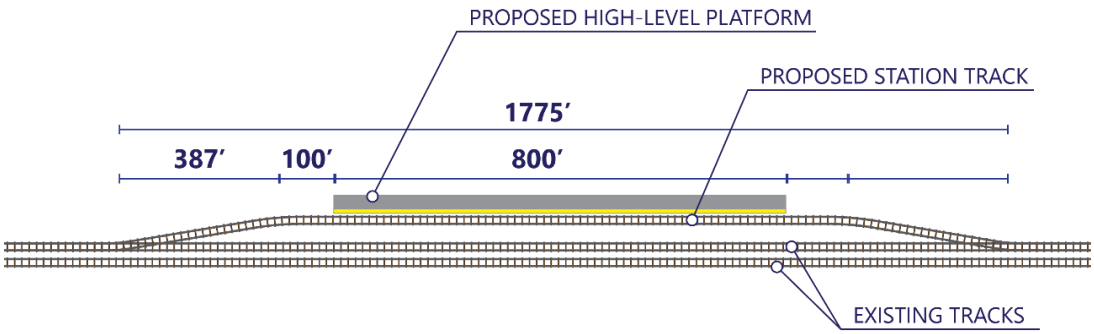
Figure 3 Typical Station Diagram (Not to Scale) – Minimum Clearance Required



› The station siding track must also meet the following minimum standards:

- Turnouts from an active CSX track must be located on a tangent section.
- The fatal flaw screening analysis assumed the use of a #15 turnout, which allows for a maximum authorized speed (MAS) of 30 mph for trains entering the platform track. For a #15 turnout, the distance between the point of switch and the tangent section of the station siding track parallel to the platform is approximately 387′, although this may vary depending on the specific alignment.
- Per guidance from MassDOT and Amtrak, a minimum platform length of 800′ is required to accommodate Amtrak's future fleet.
- The fatal flaw screening analysis also includes a minimum of 100′ of uniform tangent track on either side of the platform to align train cars with the platform to maintain platform vehicle clearance requirements (specified in 49 C.F.R. 37.42(f) and Section 5.2.1 *Horizontal Gaps and Vertical Variances of the FRA ADA Passenger Rail Platform Guidance and Lessons Learned,* April 2022).
- Figure 4 illustrates the minimum distance needed for the required station track and platform infrastructure.

Figure 4 Typical Station Diagram (Not to Scale) – Minimum Distance Required



Freight Operations Impacts

Does the site interfere with the diamond junction (CP-83, between CSX and NECR) or the CSX Palmer Yard?

To meet this criterion:

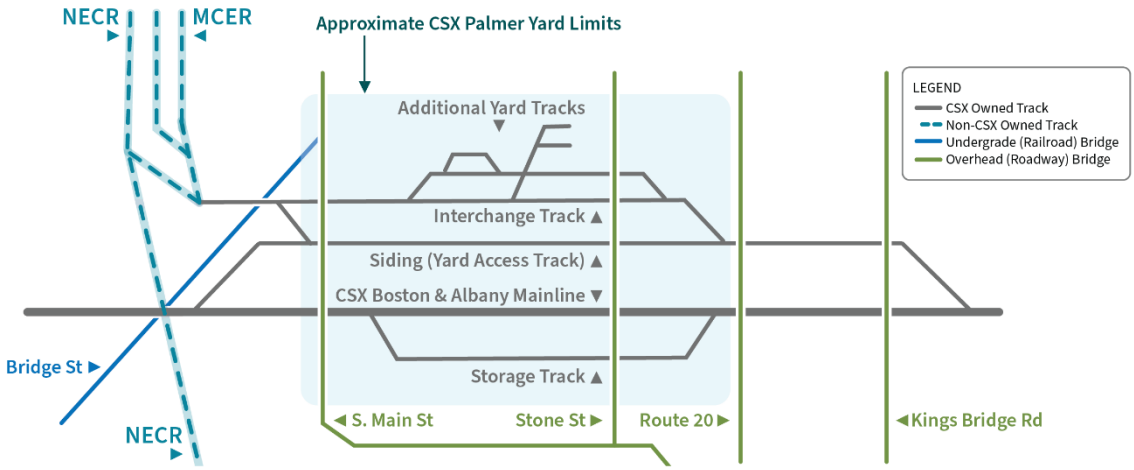
› The station siding track must be located outside the wayside signals on either side of the CP-83 diamond junction to avoid interference with cross movements.

- The CSX and NECR mainlines intersect at the CP-83 diamond junction in Palmer's Depot Village. Crossing the NECR mainline would require a second diamond crossing. CSX policy does not allow new diamond crossings, and CSX is actively reducing the number of diamond crossings across their footprint.
- The CSX mainline approach to CP-83 is controlled by signals approximately 200 feet to the west and approximately 500 feet to the east of where the CSX mainline crosses the NECR mainline.
- Signal infrastructure within CP-83 includes significant quantities of control cables, signal cables, track circuits, switch cables, and switches. For safety purposes, the platform could not be located adjacent to this infrastructure. The platform should not be in the approach of the interlocking, which would hinder operation in and out of the area.
- In addition to controlling the CSX mainline crossing of the NECR mainline, CP-83 also controls moves between the Palmer Yard and the CSX mainline. Palmer Yard is located within the CSX right-of-way east of the diamond junction, adjacent to a siding that is used for interchange between two freight rail corridors. This NECR connecting track provides direct access to Palmer Yard.
- Adding any additional track through CP-83 would require reconstructing and reprogramming all of the signal infrastructure through CP-83 to accommodate movements on the new track. The design would increase dwell times in the interlocking, and would degrade freight operations in and out of the interlocking.

› To avoid interference with CSX Palmer Yard operations (Figure 5), the station track, platform, and associated infrastructure must be located either on the south side of the yard or be otherwise accessible from the CSX mainline.

- A yard access track, over 20,000 feet long, connects to the CSX mainline just to the east of the Palmer diamond, and just north of King's Bridge Road.
- The yard is adjacent to this yard access track, with an interchange track to the north and a ladder to 3 additional tracks off the interchange track to the north, as well as a rarely occupied storage track to the south of the mainline. Trains operating in Palmer Yard are able to switch without occupying the mainline, but the yard frequently reaches capacity with cars overflowing onto the yard access track.
- CSX operates up to fifteen daily trains on the CSX mainline through Palmer, which will grow to 21 daily trains in the future, with many of these trains interchanging at the Palmer Yard. One of the eastbound merchandise trains traveling to Worcester makes a stop at Palmer Yard ranging from 30 minutes to two hours, during which the train remains on the siding while cars are picked up and set out from the yard.
- The merchandise trains that utilize Palmer Yard currently span up to 8,000 feet in length and are anticipated to grow to 9,000 feet in length to accommodate growing freight volumes. CSX sometimes stores and stages these trains outside of the yard on the siding track, so the turnout to the station siding track must be off the mainline to avoid potential conflicts between station access and Palmer Yard operations, including freight staging outside of the yard. Any access to the station siding track from the yard access track would require further coordination and confirmation from CSX.
- On the south side of Palmer Yard, there may be an opportunity to relocate the rarely used storage track on the south side of the CSX mainline elsewhere in the vicinity of Palmer, although this would require further coordination and confirmation from CSX.

Figure 5 Schematic of CSX Palmer Yard and Related Access (Not to Scale)



Level 1 Fatal Flaw Screening Results

This section details the fatal flaw screening results for each of the nine sites identified (in alphabetical order), focusing on the configuration of the rail infrastructure. For each site, a summary of the potential constraints and decision points relating to each fatal flaw criterion is provided, and a preliminary sketch shows the basis of the screening. Based on the findings for each fatal flaw criterion, each site either advanced to the Level 2 Comparative Evaluation or was removed from further consideration.

Site A: East of Crane Hill Road (Wilbraham)

The evaluation assumed all track infrastructure should be east of Crane Hill Road (Figure 6). On the north side of the right-of-way, residential properties separate the right-of-way from US-20. On the south side of the right-of-way, a large plot of privately-owned vacant land separates the right-of-way from a few residential properties along Crane Hill Road. To minimize residential property impacts, the alternatives analysis assumed the station siding track and platform will be on the south side of the existing CSX mainline.

Figure 6 Level 1 Fatal Flaw Screening Preliminary Sketch: Site A

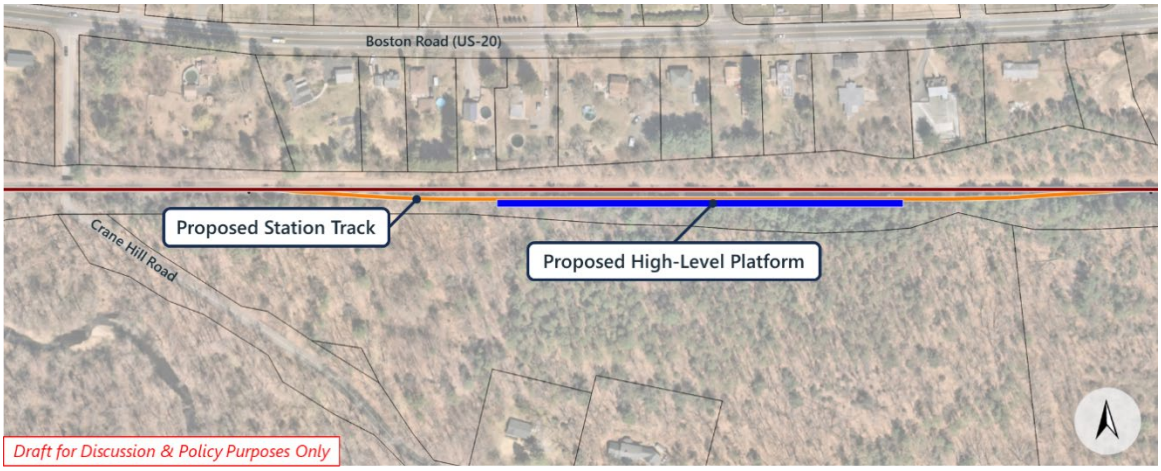


Table 2 Level 1 Fatal Flaw Screening Results: Site A

Topic	Meets Criteria	Summary
Operational Compatibility	Yes	› Site A is on the Compass Rail corridor.
Track Geometry and ROW Limits	Yes	› There is ample width to accommodate a station siding track and associated platform infrastructure
Freight Operations Impacts	Yes	› Site A is located approximately four miles west of the CP-83 diamond junction and does not interfere with the CP-83 diamond junction or Palmer Yard operations
Result	**Advance**	› Meets all Level 1 Fatal Flaw screening criteria

Site B: South of Palmer Yard

The south side of Palmer Yard includes an existing siding track with approximately 13.5' clearance from the CSX mainline. To locate a station on the south side of the right-of-way, a new station siding track meeting the minimum clearance requirements for passenger platform track would need to be constructed from the mainline (Figure 7). The evaluation assumed that the existing siding track could potentially be relocated, although this would require further coordination with CSX.

Figure 7 Level 1 Fatal Flaw Screening Preliminary Sketch: Site B

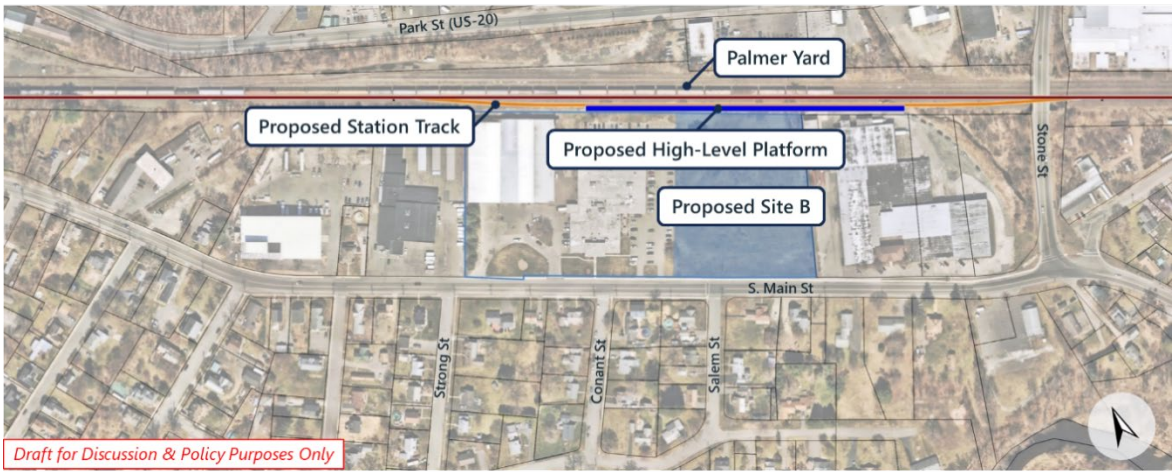


Table 3 Level 1 Fatal Flaw Screening Results: Site B

Topic	Meets Criteria	Summary
Operational Compatibility	Yes	› Site B is on the Compass Rail corridor.
Track Geometry and ROW Limits	Yes	› There is sufficient horizontal clearance to accommodate a station siding track and associated platform infrastructure
Freight Operations Impacts	Yes (Potential)	› Site B is located less than one mile east of the CP-83 diamond junction but does not interfere with the CP-83 diamond junction › Site B is located adjacent to/on the south side of Palmer Yard but does not interfere with Palmer Yard operations › Site B would require the relocation of an existing siding track on the south side of the CSX mainline and would require further coordination to evaluate potential operational impacts of the relocation
Result	**Advance**	› Potential to meet all Level 1 Fatal Flaw screening criteria, subject to further coordination with CSX to evaluate potential operational impacts associated with the siding relocation

Site C: US-20, East of Nipmuck Street

On the north side of the right-of-way, two parcels currently occupied by an auto repair shop and an upholstery store separate the right-of-way from US-20. On the south side of the right-of-way, vacant land with unknown ownership separates the right-of-way from the Quaboag River. Two tracks run through the segment: the CSX mainline and a yard access track to its north. The Level 1 screening considered two options for Site C: locating the station siding track and platform infrastructure on the north side of the yard access track (Figure 8) and locating the station siding track and platform infrastructure on the south side of the CSX mainline (Figure 9).

Locating the station siding track and platform on the north side of the yard access track (Figure 8) would require that the station siding track be constructed off the yard access track. To minimize freight operations impacts, an additional crossover would be required on each side of the station. The yard access track joins the CSX mainline more than two miles northeast of the station. Installation of a new crossover on the east side of the station would allow passenger trains to continue along the CSX mainline until they are within a mile of the station, while an additional crossover to the west of the station would allow trains to return to the mainline before passing through Palmer Yard; however, using the yard access track in this segment could conflict with freight storage and staging.

Locating the station siding track and the related platform infrastructure on the south side of the right-of-way would avoid freight operations impacts but would require a pedestrian access path to be built across the tracks (Figure 9).

Figure 8 Level 1 Fatal Flaw Screening Preliminary Sketch: Site C (North Side of Track)

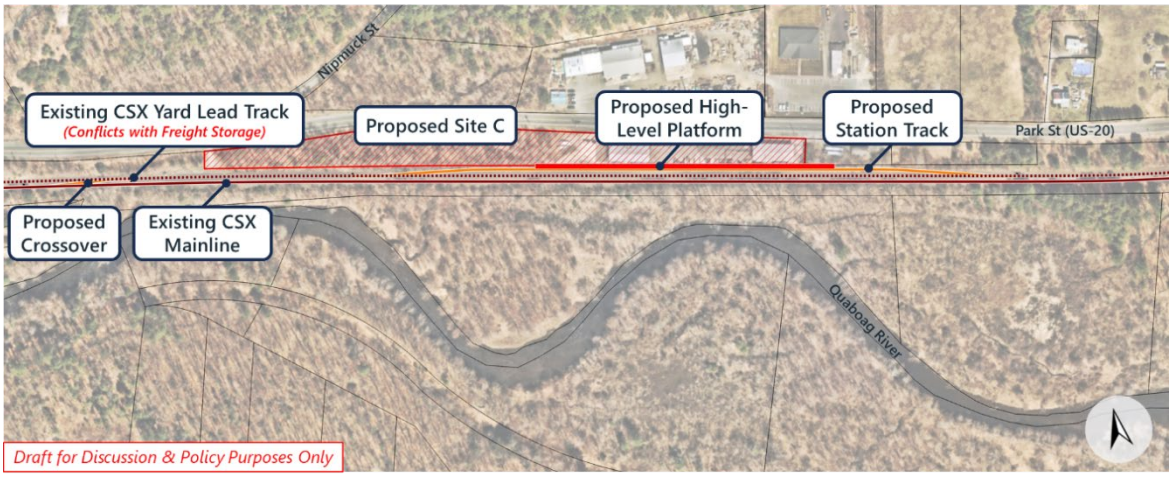


Table 4 Level 1 Fatal Flaw Screening Results: Site C (North Side of Track)

Topic	Meets Criteria	Summary
Operational Compatibility	Yes	› Site C is on the Compass Rail corridor
Track Geometry and ROW Limits	Yes	› There is sufficient width to accommodate a station siding track and associated platform infrastructure
Freight Operations Impacts	No	› Site C is located approximately 1.9 miles east of the CP-83 diamond junction and does not interfere with the CP-83 diamond junction › Site C is located approximately 0.6 miles east of Palmer Yard › Locating the station siding track and associated platform infrastructure on the north side of the Palmer Yard access track would conflict with freight storage, staging, and movement on the existing Palmer Yard access track
Result	**Do Not Advance**	› Does not meet Freight Operations Impacts criterion

Figure 9 Level 1 Fatal Flaw Screening Preliminary Sketch: Site C (South Side of Track)

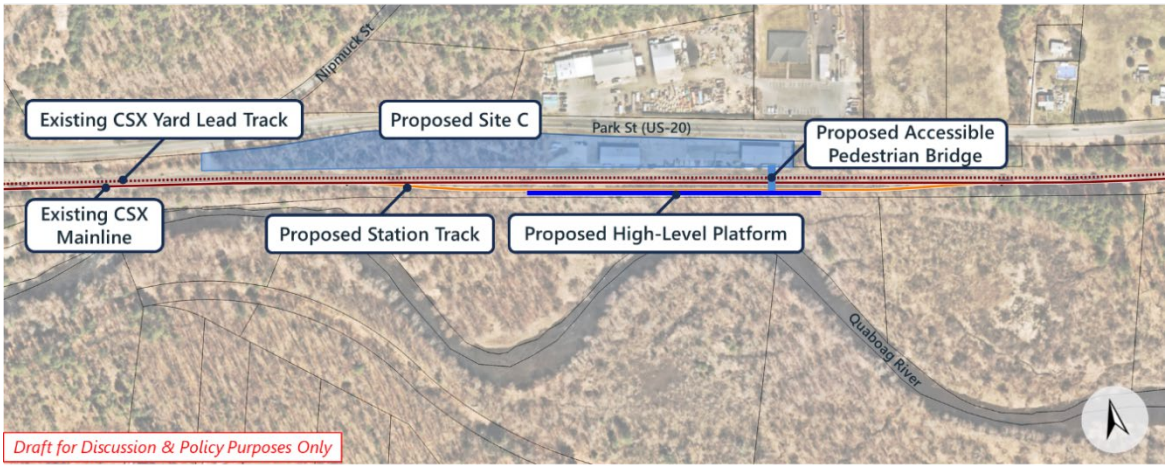


Table 5 Level 1 Fatal Flaw Screening Results: Site C (South Side of Track)

Topic	Meets Criteria	Summary
Operational Compatibility	Yes	› Site C is on the Compass Rail corridor
Track Geometry and ROW Limits	Yes	› There is sufficient width to accommodate a station siding track and associated platform infrastructure
Freight Operations Impacts	Yes	› Site C is located approximately 1.9 miles east of the CP-83 diamond junction and does not interfere with the CP-83 diamond junction › Site C is located approximately 0.6 miles east of the Palmer Yard and does not interfere with Palmer Yard operations › Site C would require pedestrian access between Site C and a platform on the south side of the CSX mainline and would require further coordination to evaluate potential operational impacts of constructing the proposed pedestrian access across the Palmer Yard access track and CSX mainline
Result	**Advance**	› Meets all Level 1 Fatal Flaw screening criteria, subject to further coordination with CSX to evaluate potential operational impacts during construction

Site D: Boston Road

The evaluation assumed that all track infrastructure should be west of the Quaboag River to avoid bridge reconstruction. To the west, the placement of the station siding track and associated platform infrastructure is constrained by curves in the existing alignment. On the north side of the right-of-way, residential properties and a large parcel of vacant land partially occupied by a solar farm separate the right-of-way from Boston Road. On the south side of the right-of-way, two privately-owned vacant parcels separate the right-of-way from the Quaboag River.

This segment of the right-of-way includes two existing tracks: the CSX mainline and a yard access track north of the mainline that begins east of Kings Bridge Road. The Level 1 screening considered two options for Site D: locating the station siding track and platform infrastructure on the north side of the yard access track (Figure 10) and locating the station siding track and platform infrastructure on the south side of the CSX mainline (Figure 11).

Locating the station siding track and platform on the north side of the right-of-way (Figure 10) would require the installation of an additional crossover west of the station to allow passenger trains to return to the mainline before passing through Palmer Yard and minimize potential impacts on freight operations utilizing the yard access track; however, using the yard access track in this segment could conflict with freight storage and staging. East of the proposed station location, the existing turnout is within about 0.3 miles and could potentially be used to access the station.

Since access to the station would likely be from Boston Road, locating the station siding track and platform on the south side of the right-of-way would require additional pedestrian access infrastructure to be constructed across the tracks (Figure 11).

Figure 10 Level 1 Fatal Flaw Screening Preliminary Sketch: Site D (North Side of Track)

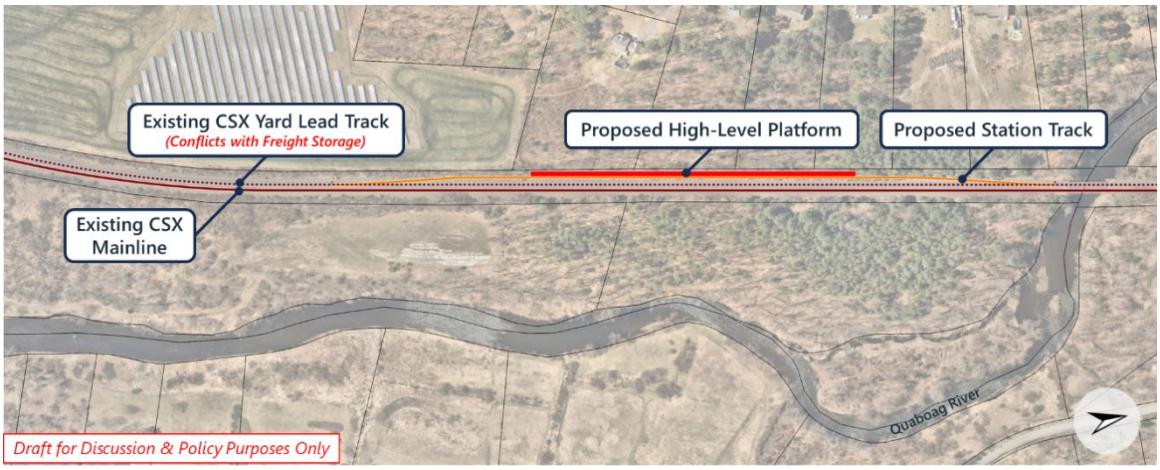


Table 6 Level 1 Fatal Flaw Screening Results: Site D (North Side of Track)

Topic	Meets Criteria	Summary
Operational Compatibility	Yes	› Site D is on the Compass Rail corridor
Track Geometry and ROW Limits	Yes	› There is sufficient width to accommodate a station siding track and associated platform infrastructure
Freight Operations Impacts	No	› Site D is located approximately 3.5 miles east of the CP-83 diamond junction and does not interfere with the CP-83 diamond junction › Site D is located approximately 2.2 miles east of the Palmer Yard › Locating the station siding track and associated platform infrastructure on the north side of the Palmer Yard access track would conflict with freight storage, staging, and movement on the existing Palmer Yard access track
Result	**Do Not Advance**	› Does not meet Freight Operations Impacts criterion

Figure 11 Level 1 Fatal Flaw Screening Preliminary Sketch: Site D (South Side of Track)

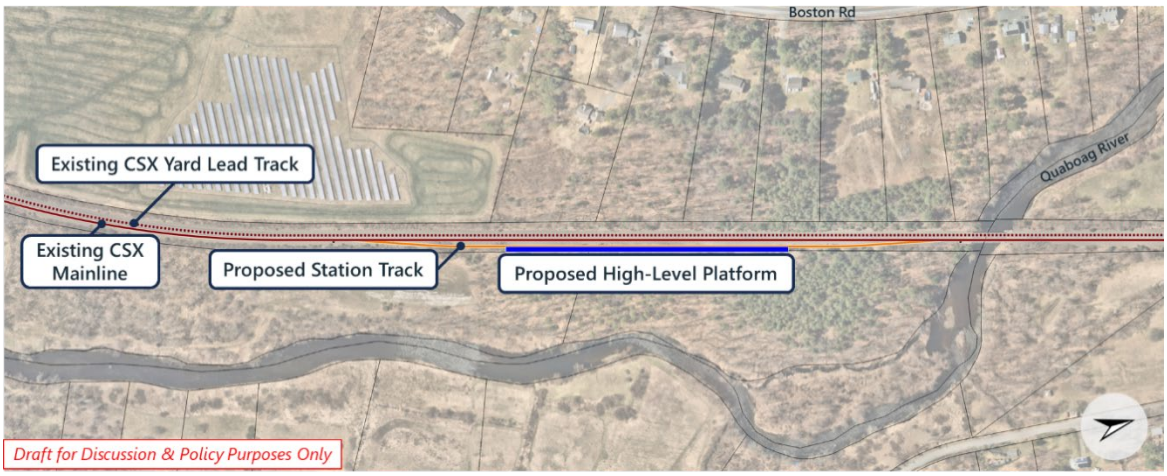


Table 7 Level 1 Fatal Flaw Screening Results: Site D (South Side of Track)

Topic	Meets Criteria	Summary
Operational Compatibility	Yes	› Site D is on the Compass Rail corridor
Track Geometry and ROW Limits	Yes	› There is sufficient width to accommodate a station siding track and associated platform infrastructure › The proposed location may need to be refined through the Level 2 Comparative Evaluation
Freight Operations Impacts	Yes	› Site D is located approximately 3.5 miles east of the CP-83 diamond junction and does not interfere with the CP-83 diamond junction › Site D is located approximately 2.2 miles east of the Palmer Yard and does not interfere with Palmer Yard operations › Site D would require pedestrian access between Site D and a platform on the south side of the CSX mainline and would require further coordination to evaluate potential operational impacts of constructing the proposed pedestrian access across the Palmer Yard access track and CSX mainline
Result	**Advance**	› Meets all Level 1 Fatal Flaw screening criteria, subject to further coordination with CSX to evaluate potential operational impacts during construction

Site E: Palmer Redevelopment Authority (PRA) Lot

Site E is located adjacent to the CP-83 diamond junction, to the north of the NECR right-of-way (Figure 12). The Compass Rail corridor is across the NECR tracks.

Figure 12 Level 1 Fatal Flaw Screening Preliminary Sketch: Site E

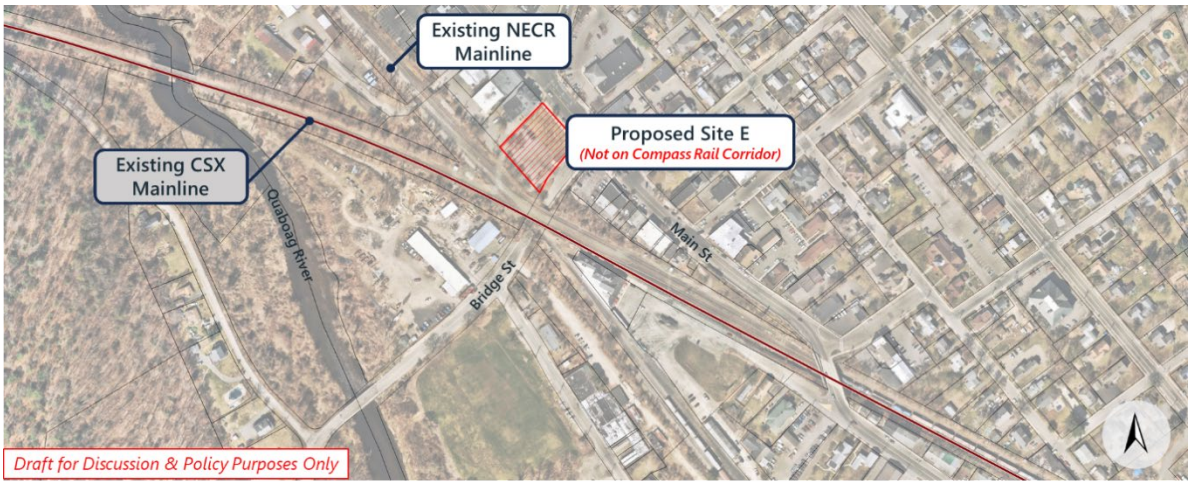


Table 8 Level 1 Fatal Flaw Screening Results: Site E

Topic	Meets Criteria	Summary
Operational Compatibility	No	› Site E is not on the Compass Rail corridor
Track Geometry and ROW Limits	N/A	› Track geometry not evaluated for NECR alignments
Freight Operations Impacts	N/A	› Freight operations impacts not evaluated for NECR alignments
Result	**Do Not Advance**	› Does not meet Operational Compatibility criterion

Site F: Palmer Department of Public Works (DPW) Lot

Site F is located immediately west of the CP-83 diamond junction (Figure 13). To avoid interference with the CP-83 diamond junction, the evaluation placed the station infrastructure west of the existing signal. CSX standard practice requires turnouts to be on straight track and track to be straight for 200′ approaching a turnout. Due to existing curvature between the diamond crossing and the bridge over the Quaboag River, the CSX mainline track to the west of the CP-83 diamond junction would require realignment to accommodate a station siding track. The evaluation assumed that the station siding track would be south of the realigned CSX mainline track based on curvature and right-of-way constraints. The station platform and track infrastructure would be separated from the station facility infrastructure by the Quaboag River, and the existing bridge would need to be reconstructed to accommodate the station track and pedestrian access. On the north side of the right-of-way, a vacant parcel separates the right-of-way from the Quaboag River. On the south side, Fern Hill Road cuts through a large private parcel in proximity to the proposed platform location.

Figure 13 Level 1 Fatal Flaw Screening Preliminary Sketch: Site F

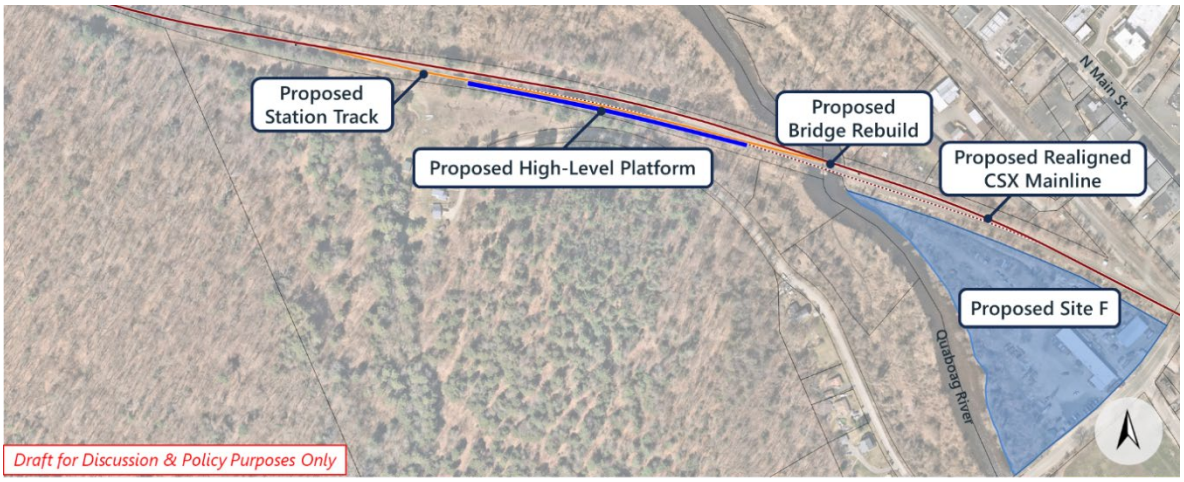


Table 9 Level 1 Fatal Flaw Screening Results: Site F

Topic	Meets Criteria	Summary
Operational Compatibility	Yes	› Site F is on the Compass Rail corridor
Track Geometry and ROW Limits	Yes	› The CSX mainline west of the Palmer Diamond has curvature that does not provide tangent track to accommodate a turnout for a station siding › In order to provide a turnout for a station siding, the CSX mainline needs to be realigned between the Quaboag River and the Palmer Diamond › The closest placement of a station siding to the Palmer Diamond would require the station platform to span the Quaboag River or, alternatively, be located to the west of the Quaboag River (as shown) › Site F would require realignment of the CSX mainline, a new bridge, and new pedestrian access across the Quaboag River
Freight Operations Impacts	Yes (Potential)	› Site F would require realignment of the CSX mainline to the west of the CP-83 diamond junction and would require further coordination to evaluate potential operational impacts of the proposed realignment › Site F does not interfere with Palmer Yard operations
Result	**Advance**	› Potential to meet all Level 1 Fatal Flaw screening criteria, subject to further coordination with CSX to evaluate the operational impact of geometric changes

Site G: Water Street Fields

Site G is located south of the CP-83 diamond junction, closer to the NECR right-of-way. It is separated from the Compass Rail corridor by the parcels between the two railroads, the NECR tracks, and properties along Water Street (Figure 14).

Figure 14 Level 1 Fatal Flaw Screening Preliminary Sketch: Site G

Table 10 Level 1 Fatal Flaw Screening Results: Site G

Topic	Meets Criteria	Summary
Operational Compatibility	No	› Site G is not on the Compass Rail corridor.
Track Geometry and ROW Limits	N/A	› Track geometry not evaluated for NECR alignments
Freight Operations Impacts	N/A	› Freight operations impacts not evaluated for NECR alignments
Result	**Do Not Advance**	› Does not meet Operational Compatibility criterion.

Site H: Historic Location

The two parcels identified as Site H (which include the historic depot building) lie between the CSX right-of-way and the NECR right-of-way, immediately to the east of the CP-83 diamond junction (Figure 15). To avoid interference with the CP-83 diamond junction, the station siding track and platform were placed east of the existing signal. Since the South Main Street bridge is approximately 400' east of the signal, the evaluation assumed that the platform would begin east of the bridge. The station siding and track would need to be placed on the south side of the right-of-way to avoid interference with Palmer Yard.

Figure 15 Level 1 Fatal Flaw Screening Preliminary Sketch: Site H

Table 11 Level 1 Fatal Flaw Screening Results: Site H

Topic	Meets Criteria	Summary
Operational Compatibility	Yes	› Site H is on the Compass Rail corridor.
Track Geometry and ROW Limits	No	› There is insufficient horizontal clearance within the ROW to accommodate a station siding track and associated platform infrastructure. • Placing a station siding track and platform immediately adjacent to the historic depot would impact the historic building due to the inadequate horizontal clearance. • The Palmer Diamond is located immediately to the west of the historic depot, and potential infrastructure to the west of the Palmer Diamond is described as part of the evaluation of Site F. • The closest placement of a station siding to the Palmer Diamond would require the station platform to span under the South Main Street bridge or, alternatively, be located to the east of the bridge (as shown), where there is insufficient horizontal clearance to accommodate a station siding track and platform without impacting private properties. › Site H would require bridge reconstruction and private property acquisition
Freight Operations Impacts	N/A	› Freight operations impacts not evaluated due to insufficient ROW
Result	**Do Not Advance**	› Does not Meet Track Geometry and ROW Limits criterion. The project team has determined that locating a Palmer Station at this site would be difficult and costly due to modern design standards and operating requirements. There is inadequate space to accommodate the necessary train station tracks and platform without requiring costly additional track infrastructure, bridge reconstruction, and significant property takings. At this conclusion, the historic depot (Site H) was removed from further consideration.

Site I: North of Palmer Yard

The north side of Palmer Yard includes a yard ladder with multiple yard tracks. To avoid impacts on Palmer Yard freight operations, the evaluation assumed that the station siding track and platform would be configured on the south side of Palmer Yard, in the same location as for Site B (Figure 16).

Figure 16 Level 1 Fatal Flaw Screening Preliminary Sketch: Site I

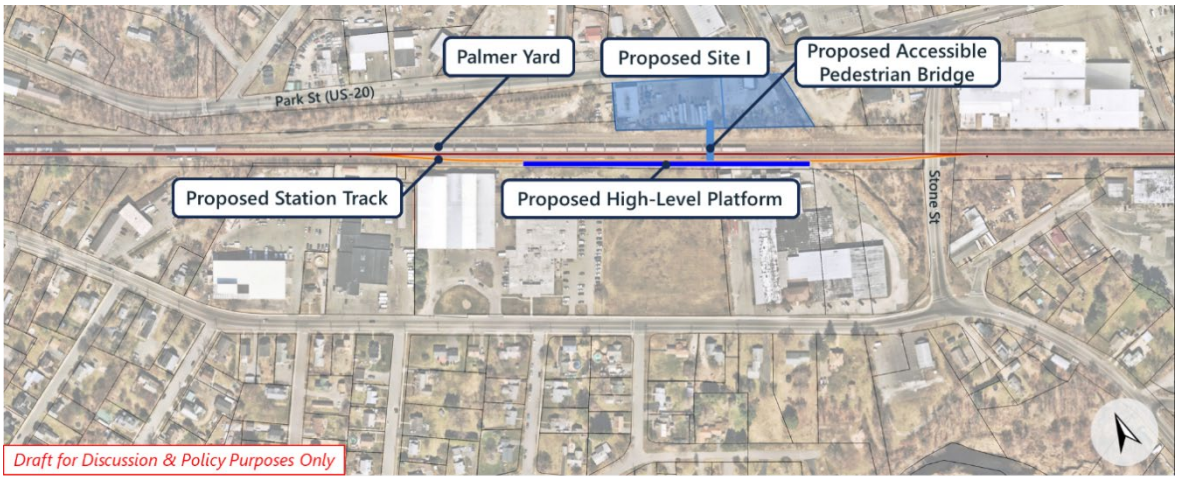


Table 12 Level 1 Fatal Flaw Screening Results: Site I

Topic	Meets Criteria	Summary
Operational Compatibility	Yes	› Site I is on the Compass Rail corridor
Track Geometry and ROW Limits	Yes	› There is sufficient horizontal clearance to accommodate a station siding track and associated platform infrastructure
Freight Operations Impacts	Yes (Potential)	› Site I is located under one mile east of the CP-83 diamond junction but does not interfere with the CP-83 diamond junction › Site I is located adjacent to/on the north side of Palmer Yard › Locating a station siding track and associated platform infrastructure on the north side of Palmer Yard would interfere with Palmer Yard operations › To avoid interfering with Palmer Yard operations, Site I would require pedestrian access between Site I and a platform on the south side of the CSX mainline and would require further coordination to evaluate potential operational impacts of constructing the proposed pedestrian access › Site I would also require the relocation of an existing siding track on the south side of the CSX mainline and would require further coordination to evaluate potential operational impacts of the relocation
Result	**Advance**	› Potential to meet all Level 1 Fatal Flaw screening criteria, subject to further coordination with CSX to evaluate potential operational impacts during construction and associated with the siding relocation

Summary

Table 13 provides a summary of the results of the Level 1 Fatal Flaw Screening for the nine potential sites identified for Palmer Station. Based on this screening, Sites A, B, C, D, F, and I met all of the Level 1 Fatal Flaw screening criteria and advanced to the Level 2 Comparative Evaluation, subject to further coordination with CSX. For Sites C and D, only the concepts for locating a station on the south side of the track advanced to the Level 2 Comparative Evaluation, while the north side concepts did not advance due to potential impacts to freight staging. Sites E and G did not advance upon failure to meet the Operational Compatibility criterion, and Site H did not advance due to insufficient clearance within the ROW limits.

Table 13 Summary of Level 1 Fatal Flaw Screening Results

Site	Meets Criteria			Result to Advance to Level 2 Evaluation
	Operational Compatibility	Track Geometry and ROW Limits	Freight Operations	
Site A: East of Crane Hill Road (Wilbraham)	**Yes**	**Yes**	**Yes**	**Advance**
Site B: South of Palmer Yard	**Yes**	**Yes**	**Yes* (Potential)**	**Advance**
Site C: US 20, East of Nipmuck Street (North Side of Track)	Yes	Yes	No	Do Not Advance
Site C: US 20, East of Nipmuck Street (South Side of Track)	**Yes**	**Yes**	**Yes**	**Advance**
Site D: Boston Road (North Side of Track)	Yes	Yes	No	Do Not Advance
Site D: Boston Road (South Side of Track)	**Yes**	**Yes**	**Yes**	**Advance**
Site E: Palmer Redevelopment Authority (PRA) Lot	No	N/A	N/A	Do Not Advance
Site F: Palmer Department of Public Works (DPW) Lot	**Yes**	**Yes**	**Yes* (Potential)**	**Advance**
Site G: Water Street Fields	No	N/A	N/A	Do Not Advance
Site H: Historic Location	Yes	No	N/A	Do Not Advance
Site I: North of Palmer Yard	**Yes**	**Yes**	**Yes* (Potential)**	**Advance**

4

Level 2 Comparative Evaluation

This chapter documents the Level 2 Comparative Evaluation. The Level 2 Comparative Evaluation analyzed the operational and engineering feasibility of each site not only for its ability to accommodate a station at the site, which was evaluated in the Level 1 screening, but also in how well it delivers on the five goals and objectives of the project to:

1. Provide and create an intercity rail stop on the proposed Compass Rail corridor while meeting operational requirements for Amtrak, CSX, and other freight operators and minimizing freight operations impacts;
2. Enhance passenger mobility and connectivity for local and regional growth and to support access to the Five College Consortium;
3. Improve local and regional economy and livability;
4. Support local and regional goals to reduce dependency on auto transportation by offering an alternative choice for travelers and providing opportunities for multimodal station access; and
5. Avoid and minimize social, cultural, and natural environmental impacts.

The sites were evaluated against screening criteria in five categories: Engineering and Operations, Environment, Mobility, Economic Development Potential, and Implementation. The following sections describe the approach and methodology for the Level 2 Comparative Evaluation and the results.

Figure 17 Sites Evaluated in the Level 2 Comparative Evaluation

LEGEND

- Potential Locations
- Town Boundary
- Proposed Compass Rail Corridor / Current Amtrak Lake Shore Limited Service Track Owned by CSX
- Other Railroad Lines

N

0 0.5 1
MILES

Approach and Methodology

Sites that met all three Level 1 fatal flaw screening criteria were further assessed through the Level 2 Comparative Evaluation, which was based on an array of criteria across five categories:

- Engineering and Operations
  - Anticipated Horizontal Curvature
  - Anticipated Grade through Station Platform Area
  - High-Level Assessment of Freight Operations Impacts
- Environment
  - Within Wetlands Protection Act (WPA) Wetland Resource Area
  - Proximal or Within Endangered Species Habitats
  - Potential "Use" of Publicly-Owned/Accessible Park, Open Space, Recreation Resources
  - Potential Impacts to Nationally-Listed or Known Eligible Historic Resources
  - Within or Immediately Adjacent to Environmental Justice (EJ) Populations
  - Proximity to Sensitive Noise & Vibration Receptors
- Mobility
  - Non-Motorized Travel (Walk-access and Bike-access)
  - Motorized Travel (Drive-access)
  - Ability to Accommodate Vehicular Access Needs (Passenger Cars)
  - Ability to Accommodate Vehicular Access Needs (Transit Shuttles)
  - Ability to Accommodate Pedestrian Access Needs (Walk, ADA)
- Economic Development Potential
  - Conditions Supportive of Transit Oriented Development (TOD)
  - Conditions Supportive of Revitalization of Existing Uses
  - Consistency with Local Planning Goals
  - Consistency with Local Zoning
- Implementation Considerations
  - Key Cost Elements
  - Schedule Drivers and Anticipated Permitting

For each Engineering and Operations, Environment, Mobility, and Economic Development Potential criterion, each site was ranked as favorable, neutral, or unfavorable based on qualitative or quantitative metrics. Implementation Considerations criteria were assessed comparatively across sites; key cost elements for each site were rated in relative to the highest-cost site, and binary ratings were provided for schedule drivers and anticipated permitting. The rankings across all Comparative Evaluation criteria were then summarized for each site to support the selection of the preferred site.

Engineering and Operations

The engineering and operations analysis considered the anticipated layout and operations of each site. As the evaluation advanced from the Level 1 Fatal Flaw Screening to the Level 2 Comparative Evaluation, the designs for some sites were refined to better meet industry standards. Based on track charts of the existing tracks and aerial imagery, the analysis approximated the anticipated degree of curvature for the proposed station siding track and the anticipated grade through the station platform area and classified each site using thresholds informed by industry standards. A high-level freight impact assessment evaluated potential freight operations impacts for each site. Table 14 summarizes the evaluation thresholds for each criterion.

Table 14 Level 2 Comparative Evaluation Thresholds: Engineering and Operations

Criteria	Favorable	Neutral	Unfavorable
Anticipated Horizontal Curvature[1]	~0°	0-1°	1°-1°40′
Anticipated Grade through Station Platform Area[2]	0-0.08%	0.08-0.3%	>0.3%
High-Level Assessment of Freight Operations Impacts[3]	No Impacts or Minor Impacts	Moderate Impacts	Major Impacts

1 The AREMA Manual for Railway Engineering (MRE) Chapter 11 (Commuter and Intercity Rail Systems) Section 4.2.3.1 (Facilities and Structural Considerations – Passenger Facilities – Boarding Platforms – Platform Location) states that "a limitation of 1°40′ or 1" of superelevation is desirable." This is also in an FRA ADA Platform Guidance Paper dated 4/11/2022. Platforms on track with a degree of curvature higher than 1°40′ don't meet ADA requirements.

2 The Amtrak Track Design Specification #63, Section 5.1.3 states that "Grades through station platforms should be equal to or very close to 0.000% so that cars will not roll when the brakes are released. An easy-rolling car can start rolling on a grade as low as 0.08%." Above a grade of 0.3%, equipment is likely to accelerate.

3 The high-level freight impacts analysis for each site considered its proximity to railroad junctions, proximity to freight yard and freight yard access points, proximity to grade crossings, and potential interference with freight operations during and after construction.

Environment

The environmental analysis used GIS mapping to overlay the site locations with the relevant environmental resource layers and identify potential environmental impacts of each site. Table 15 summarizes the evaluation thresholds for each criterion.

Table 15 Level 2 Comparative Evaluation Thresholds: Environment

Criteria	Favorable	Neutral	Unfavorable
Within WPA Wetland Resource Areas[1]	No	Maybe	Yes
Proximal or within a habitat of known threatened or endangered species – State or Federal[2]	No	Maybe	Yes
Use of Section 4(f) property, Section 6(f) property, or lands protected by Article 97[3]	No	Maybe	Yes
Potential Impact to listed or known eligible Historic Resources[4]	No	Maybe	Yes
Environmental Justice Populations within or immediately adjacent to the site[5]	No	Maybe	Yes
Proximal to Sensitive Noise & Vibration Receptors[6]	No	Maybe	Yes

Sources:

1 MassGIS MassDEP Wetlands, NHESP Certified Vernal Pools, National Wetlands Inventory, MassDEP Wellhead Protection Areas, MassDEP Surface Water Supply Protection Areas, MassDEP Hydrography, Major Drainage Basins, and FEMA National Flood Hazard Layer mapping datalayers.

2 U.S. Fish & Wildlife Service Information for Planning and Consultation; and the MassGIS NHESP Priority & Estimated Habitat mapping datalayer.

3 MassGIS Protected and Recreational Open Space and DCR Roads and Trails mapping datalayers; the 2022-2028 Wilbraham Open Space and Recreation Plan; the 2021-2027 Palmer Open Space and Recreation Plan; and MACRIS.

4 MACRIS.

5 EEA 2020 EJ Block Groups.

6 Federal Transit Authority's Transit Noise and Vibration Impact Assessment Manual; MassGIS Places of Worship, and Massachusetts Schools (Pre-K through High School) mapping datalayers.

Mobility

Under the Mobility criteria, two aspects of each site are evaluated: (1) potential ridership market capture based on travel time access to the site and (2) physical components of the site that accommodate the passenger access modes.

For quantitative mobility metrics, GIS mapping was used to explore the access opportunities associated with each site, relating the geographic proximity of the site to potential passengers of the proposed service. The quantitative mobility metrics used classify sites as favorable, neutral, or unfavorable relative to the highest-ranking site alternative for each criterion. Three metrics are reviewed to assign a rating for Non-Motorized Travel, based on walking and biking access, and two metrics are reviewed to assign a rating for Motorized Travel, based on a local drive time (of 15 minutes or less) and a broader area drive time (of 30 minutes or less). For both criteria, the assigned rating is the highest rating (favorable, neutral, unfavorable) achieved among the criterion's quantitative metrics. The two metrics for Motorized Travel were initially presented separately but were combined into a single metric based on municipal stakeholder feedback to simplify the results and reflect similarities in site access via motorized travel.

Related to the physical features of a site, high-level ("test fit") sketches of a station overlayed on an aerial image were used to identify the ability of a site to accommodate various access needs, including public transit and shuttle connections/stops, passenger pick-up/drop-off, pedestrian accessibility, and parking supply (surface parking lot). Based on the most recent projections of ridership available for Palmer Station, ridership is anticipated to be below 20,000 passenger trips per year;[7] based on the anticipated ridership, the analysis assumed that the station would be an Amtrak Category 4 Shelter Station, which would include a canopy or small shelter, self-service ticketing, and signage, but remain unstaffed.

Table 16 summarizes the evaluation thresholds for each criterion.

Table 16 Level 2 Comparative Evaluation Thresholds: Mobility/Access

Criteria	Favorable	Neutral	Unfavorable
Market Capture (Travel Shed)			
Non-Motorized Travel (Walk and Bike Access)[1,2]	>75% compared to the highest-ranking alternative[3]	60-75% compared to the highest-ranking alternative	<60% compared to the highest-ranking alternative
Motorized Travel (Drive Access)[4,5]	>75% compared to the highest-ranking alternative[3]	60-75% compared to the highest-ranking alternative	<60% compared to the highest-ranking alternative

1 A 0.5 mile walk buffer was generated using the existing street network as defined by ESRI and MassGIS to approximate an 8- to 10-minute walk to the station. The number of households is used to capture residential ridership market, and commercial rentable building area was used as a measure of business (jobs) market capture.

2 The bicycle access area was established as 1.5 miles from each station site using the existing ESRI/MassGIS street network.

3 This group includes the highest-ranking alternative.

4 15- and 30-minute drive buffers were generated using ESRI's Service Area Analysis tool and the existing MassGIS street network. This incorporates both travel access associated with I-90 and other regional roadways.

5 30-minute drive buffers for nearby Compass Rail stations were applied, discounting drive access market capture in overlapping areas where the estimated total trip time to/from Boston (accounting for both drive and train travel) was shorter from other nearby Compass Rail stations.

[7] MassDOT. East-West Passenger Rail Study Final Report. January 2021.

Table 16 Level 2 Comparative Evaluation Thresholds: Mobility/Access (continued)

Criteria	Favorable	Neutral	Unfavorable
Site Design – Physical Accommodations			
Ability to Accommodate Vehicular Access Needs (Passenger Cars)[6]	Site can accommodate expanded parking supply (100 spaces); site provides for TNC and passenger pick-up/drop-off use on-site.	Site can accommodate minimum number of spaces (45 spaces), but not expanded parking supply; site can accommodate some but not all these uses, but off-site provisions could potentially accommodate these uses.	Site cannot accommodate any of these uses **or** site can accommodate some but not all of these uses and there is **not** the potential for off-site provision to accommodate all these uses.
Ability to Accommodate Vehicular Access Needs (Transit Shuttles)[7]	Site can accommodate transit/shuttle bus use on-site; no vehicle restrictions on the primary access road to the site.	Site cannot accommodate this use, but off-site provisions could potentially accommodate it; access road conditions may restrict types of vehicles used.	Site cannot accommodate this use **nor** is there the potential for off-site provision to accommodate this use; access road condition restricts use of transit vehicles sized greater than a passenger van.
Ability to Accommodate Pedestrian Access Needs (Walk, ADA)	Walking distance between drop-off and platform is 200′ or less (less than a one-minute walk); no vertical circulation needed.[8]	Walking distance between drop-off and platform is 315′ or less (less than a 1½-minute walk); vertical circulation required.	Walking distance exceeds 315′; vertical circulation required.

6 Vehicular access was assumed to include parking supply and passenger pick-up/drop-off (including by transportation network companies (TNC)).

7 Vehicular access by transit/shuttles assumes the potential of two area transit/shuttle services, which may include, for example, a Pioneer Valley Transit Authority (PVTA) service and/or a Five Colleges/UMass service. Assumes both routes would use smaller buses or vans and would be stopped at the station for a duration long enough to allow for drop-off prior and pick-up after the train's arrival at the station. Off-site access road restrictions consist of vehicle height or size limitations.

8 Walking distance measured based on VHB's "test fit" concept plan. Vertical circulation includes use of elevator, stairs, or ramps to cross over tracks to access the platform.

Economic Development Potential

The analysis considered critical commercial and residential development performance indicators and utilized available CoStar and Esri Business Analyst data to characterize market potential, including for transformative TOD. TOD is typically defined as compact, mixed-use development that is synergistic with public transit, typically within walking distance of a station. Although Palmer Station is not expected to serve more than two rail trips per day, TOD, as used in this evaluation, refers to station area development, The analysis evaluated consistency with local planning and zoning based on a qualitative review of reference documents to identify potential conflicts with or support for existing initiatives and regulations. This criterion also considered the proximity and connection between the station and downtown (including Main Street and the Monson Developmental Center), and the enhancement of pedestrian activity to support a mixed-use community. Table 17 summarizes the evaluation thresholds for each criterion.

Table 17 Level 2 Comparative Evaluation Thresholds: Economic Development Potential

Criteria	Favorable	Neutral	Unfavorable
Conditions Supportive of TOD[1]	Site has high potential for TOD.	Site has moderate potential for TOD.	Site has low potential for TOD.
Conditions Supportive of Revitalization of Existing Uses[2]	Site has high potential for revitalization of proximal commercial uses.	Site has moderate potential for revitalization of proximal commercial uses.	Site has low potential for revitalization of proximal commercial uses.
Consistency with Local Planning Goals[3]	Site is supportive of planning goals.	Site is partially supportive of planning goals.	Site conflicts with planning goals.
Consistency with Local Zoning[4]	Underlying zoning allows for proposed site use.	Site would require special permitting.	Site would require rezoning.

1 The market potential for TOD was analyzed based on performance indicators, including the existing rentable building area, pipeline developments, percent vacancy, underutilized land/structures within walking distance, properties available for future multi-unit housing, and more.

2 Existence of conditions supportive of revitalization of existing uses, including proximity and revitalization potential of commercial properties.

3 Local planning reference documents included the Palmer Master Plan, Pioneer Valley Planning Commission (PVPC) Regional Economic Strategies (2015-2025), and more.

4 Zoning reference documents included the Palmer Zoning Bylaws. Wilbraham Zoning Bylaws, and Monson Zoning Bylaws.

Implementation Considerations

High-level implementation considerations compared the alternative sites to understand potential differences in cost and schedule. The analysis identified key cost elements for each site, including the degree of trackwork required, railroad bridge construction, pedestrian access elements, and civil works required. The evaluation also considered major schedule drivers and anticipated permitting requirements as key differentiators between sites. Major schedule drivers included CSX mainline realignment, railroad or pedestrian bridge construction, design and engineering complexity, land acquisition, and construction in municipalities outside of Palmer.

Level 2 Comparative Evaluation Results

This section presents the results of Level 2 Comparative Evaluation for each of the sites that advanced through the Level 1 Fatal Flaw Screening. For each site, a narrative summary describes the overall findings, and individual tables document the results for each of the five categories. Following the individual site results, a summary compares the results across the six sites.

Site A: East of Crane Hill Road (Wilbraham)

The evaluation of Site A assumed all track infrastructure and station accommodations should be east of Crane Hill Road (Figure 18). To minimize residential property impacts, the alternatives analysis assumed the station siding track and platform, as well as the station facility will be on the south side of the existing CSX mainline, with proposed access from Crane Hill Road. Access between the parking area and the station platform is proposed through a walkway with connections at the center and either side of the platform to comply with emergency egress requirements.

Figure 18 Level 2 Comparative Evaluation Preliminary Concept: Site A

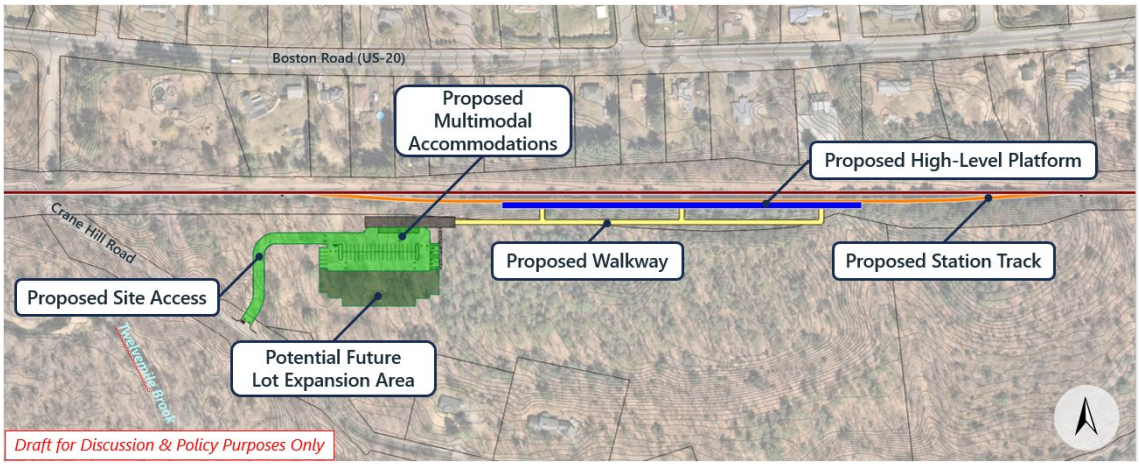


Table 18 Level 2 Comparative Evaluation Results: Engineering and Operations – Site A

Criteria	Rating	Detail
Anticipated Horizontal Curvature	Favorable	› Site A is on a tangent segment.
Anticipated Grade	Unfavorable	› The anticipated grade through the station platform area is 0.69%.
Freight Operations Impacts	Favorable	› Minor freight impacts during construction are likely limited to construction of turnouts and mainline speed restrictions. › No permanent freight impacts are anticipated.

Table 19 Level 2 Comparative Evaluation Results: Environment – Site A

Criteria	Rating	Detail
Within WPA Wetland Resource Areas	Neutral	› The site is within the 200-foot Riverfront Area (RFA) associated with a perennial stream. › Filing a Wetlands Protection Act (WPA) Request for Determination of Applicability (RDA) or Notice of Intent (NOI) with the Wilbraham Conservation Commission would be anticipated.
Proximal or within a habitat of known threatened or endangered species – State or Federal	Unfavorable	› The site is within MA Natural Heritage & Endangered Species Program (NHESP) Priority Habitat of Rare Species and Estimated Habitat of Rare Wildlife. Filing of a Massachusetts Endangered Species Act (MESA) checklist with NHESP would be anticipated. › The federal species endangered (proposed) tricolored bat, and the candidate species monarch butterfly may occur within the site boundary. Consultation is required for the tricolored bat, requiring concurrence provided in the northern long-eared bat and tricolored bat range-wide Determination Key. The monarch butterfly does not currently require further consultation under Section 7 of the Endangered Species Act (ESA).
Use of Section 4(f) property, Section 6(f) property, or lands protected by Article 97	Favorable	› No properties protected by Section 4(f) of the U.S. Department of Transportation Act of 1966, Section 6(f) of the Land and Water Conservation Fund Program, or Article 97 of the Amendments to the Massachusetts Constitution would be impacted.
Potential Impact to listed or known eligible Historic Resources	Neutral	› The site is adjacent to WIL.117, an inventoried historic property not currently listed in the National Historic Register. › Adverse effects would not be anticipated as the project would be consistent with the existing use of the rail corridor.
Environmental Justice Populations within or immediately adjacent to the site	Favorable	› The site is neither adjacent to nor within an EJ population, therefore the project would cause no displacement of or direct impacts to EJ populations.
Proximal to Sensitive Noise & Vibration Receptors	Unfavorable	› Residential neighborhoods are within 50 feet of the site and may be impacted by noise associated with a new stop such as horns and braking of trains. › A vibration assessment would be required.

Table 20 Level 2 Comparative Evaluation Results: Mobility – Site A

Criteria	Rating	Detail
Non-Motorized Travel	Unfavorable	› The number of households within walking distance totals an amount less than 60% of the highest site. › Commercial space within walking distance totals an amount less than 60% of the highest site. › The number of households within biking distance totals an amount less than 60% of the highest site.
Motorized Travel	Favorable	› The number of households within 15-minute driving time is the highest total among the sites. › The number of households within 30-minute driving time is the highest total among the sites, even when discounting for overlapping travel shed with Springfield station.
Ability to Accommodate Vehicular Access Needs (Passenger Cars)	Favorable	› The site can accommodate an expanded parking supply (at 100 spaces). › The site provides space for TNC and passenger pick up/drop-off use on-site.
Ability to Accommodate Vehicular Access Needs (Transit Shuttles)	Neutral	› The site provides curbside space for transit/shuttle bus rider pick up/drop-off and circulation. › A nearby bridge underpass (Crane Hill Road) has a height restriction of 12'5".
Ability to Accommodate Pedestrian Access Needs (Walk, ADA)	Favorable	› The walking distance between passenger drop-off and the platform is less than 200'. › No vertical circulation is needed to cross tracks to access the platform.

Table 21 Level 2 Comparative Evaluation Results: Economic Development Potential – Site A

Criteria	Rating	Detail
Conditions Supportive of TOD	Unfavorable	› Site A is in a rural residential area that lacks available commercial inventory, residential density, and possibility for mixed-uses for the support of TOD.
Conditions Supportive of Revitalization of Existing Uses	Unfavorable	› Site A is not proximate to commercial uses for potential revitalization.
Consistency with Local Planning Goals	Unfavorable	› Aligns with the *Pioneer Valley Plan for Progress 2015-2025 Building on Success: Economic Strategies for the Region*. Is not supported by local planning documents.
Consistency with Local Zoning	Unfavorable	› Currently Zoned: Residence -60 (R-60). Site A requires rezoning to IPG and ZBA approval.

Implementation Considerations

Site A requires construction of two turnouts and the station siding track, as well as at-grade pedestrian walkways for access. Moderate civil works are anticipated due to the existing topography of the site.

Key schedule drivers include land acquisition and construction in municipalities outside of Palmer. The evaluation assumed that additional coordination would be required to construct a station located in Wilbraham.

Anticipated permitting requirements include:

- WPA
  - An NOI may be required as it is located within lands jurisdictional under the Act. The site is within the 200-foot RFA, and therefore would require an alternatives analysis indicating that no other alternatives are feasible for the project to proceed at this location.
- MESA
  - The project would require a filing with the NHESP for review and approval to ensure compliance with MESA and its regulations, as the site is located within mapped state-species habitat.
- Massachusetts Environmental Policy Act (MEPA)
  - Per the 301 CMR 11.03 Review Thresholds, MEPA would be required due to potential disturbance of State habitat. An Environmental Notification Form (ENF) would be filed with MEPA for review and approval.
- National Environmental Policy Act (NEPA)
  - Federal funding would require the filing of a Federal Rail Administration (FRA) NEPA Documented (D-List) categorical exclusion (CE). This would include consultation for both Section 106 of the National Historic Preservation Act (NHPA), and Section 7 of the ESA. A vibration assessment would also be required as the site is within the residential screening distances for noise and vibration impacts.

Site B: South of Palmer Yard

The evaluation assumed that all track and platform infrastructure and station facilities would be located south of the existing CSX mainline, and the existing siding track south of the mainline could potentially be relocated. Access to the site is assumed to be from South Main Street to the south of the proposed parking area, and pedestrian access to the platform from the parking area is proposed through two accessible walkways on either end of the platform to meet emergency egress requirements (Figure 19).

Figure 19 Level 2 Comparative Evaluation Preliminary Concept: Site B

Table 22 Level 2 Comparative Evaluation Results: Engineering and Operations – Site B

Criteria	Rating	Detail
Anticipated Horizontal Curvature	Favorable	› Site B is on a tangent segment.
Anticipated Grade	Neutral	› The anticipated grade through station platform area is 0.29%.
Freight Operations Impacts	Neutral	› Minor freight impacts during construction are likely limited to construction of turnouts and mainline speed restrictions. › Moderate permanent freight impacts are anticipated due to the relocation of the infrequently used existing siding track south of the mainline.

Table 23 Level 2 Comparative Evaluation Results: Environment – Site B

Criteria	Rating	Detail
Within WPA Wetland Resource Areas	Neutral	› The site is within the 200-foot RFA associated with a perennial stream. › The site is within the 100-foot buffer associated with bordering vegetated wetland (BVW). › Filing of an RDA or NOI with the Palmer Conservation Commission would be anticipated.
Proximal or within a habitat of known threatened or endangered species – State or Federal	Favorable	› The federal candidate species monarch butterfly, which does not require further consultation under Section 7, may occur within the site boundary.
Use of Section 4(f) property, Section 6(f) property, or lands protected by Article 97	Neutral	› If the PAL.E South Main St District inventoried area is determined to be eligible for the National Historic Register, then there would be potential for it to be considered a 4(f) resource (see below), and Section 4(f) consultation may be required.
Potential Impact to listed or known eligible Historic Resources	Neutral	› The site is within the PAL.E South Main St District inventoried area. The last issued opinion by the Massachusetts Historical Commission (MHC) was in the 1980s, and there would be potential for the inventoried area to be recategorized as eligible for the National Historic Register. › Adverse effects would not be anticipated as the project would be consistent with the existing use of the rail corridor.
Environmental Justice Populations within or immediately adjacent to the site	Favorable	› The site is neither adjacent to nor within an EJ population, therefore the project would cause no displacement of or direct impacts to EJ populations.
Proximal to Sensitive Noise & Vibration Receptors	Favorable	› Residential neighborhoods are located at least 450 feet from the site and would be impacted by the noise associated with a new stop such as horns and braking of trains. › A vibration assessment would be required.

Table 24 Level 2 Comparative Evaluation Results: Mobility – Site B

Criteria	Rating	Detail
Non-Motorized Travel	Favorable	› The number of households within walking distance totals an amount less than 60% of the highest site. › Commercial space within walking distance totals an amount less than 60% of the highest site. › The number of households within biking distance totals an amount within 75% of the highest site.
Motorized Travel	Favorable	› The number of households within 15-minute driving time totals an amount within 60%, but less than 75%, of the highest site. › The number of households within 30-minute driving time totals an amount within 75% of the highest site.
Ability to Accommodate Vehicular Access Needs (Passenger Cars)	Favorable	› The site can accommodate an expanded parking supply (at 100 spaces). › The site provides space for TNC and passenger pick up/drop-off use on-site.
Ability to Accommodate Vehicular Access Needs (Transit Shuttles)	Favorable	› The site provides curbside space for transit/shuttle bus rider pick up/drop-off and circulation. › There are no vehicle height restrictions on the primary access road.
Ability to Accommodate Pedestrian Access Needs (Walk, ADA)	Favorable	› Walking distance between passenger drop-off and platform is less than 200'. › No vertical circulation is needed to access the platform.

Table 25 Level 2 Comparative Evaluation Results: Economic Development Potential – Site B

Criteria	Rating	Detail
Conditions Supportive of TOD	Favorable	› Site B supports potential TOD due to surrounding commercial and industrial uses, the density of surrounding residential development, and the allowance of mixed-uses.
Conditions Supportive of Revitalization of Existing Uses	Neutral	› Site B is surrounded by existing commercial and industrial uses with potential for revitalization.
Consistency with Local Planning Goals	Neutral	› Aligns with the *Pioneer Valley Plan for Progress 2015-2025 Building on Success: Economic Strategies for the Region*. Additionally, the *Palmer Master Plan (2021)* includes Goal 1.1.8 Proactively prepare a Neighborhood Transit-Oriented Development Plan for the area around a preferred location for a new rail station associated with the East-West Passenger Rail Project.
Consistency with Local Zoning	Neutral	› Currently Zoned: Industrial A. Site B has a reasonable argument for rezoning to HB and Town Manager Approval.

Implementation Considerations

Site B requires the construction of two turnouts, the station siding track, and relocation of the existing siding track. Site B also includes at-grade pedestrian walkways for access, and minor civil works.

Land acquisition is a key schedule driver for Site B.

Anticipated permitting requirements include:

› WPA

- An NOI would be required as it is located within lands jurisdictional under the Act. The site is within the 200-foot RFA, and therefore would require an alternatives analysis indicating that no other alternatives are feasible for the project to proceed at this location.

› NEPA

- Federal funding would require the filing of an FRA NEPA D-List CE. This would include consultation for both Section 106 of the NHPA, Section 7 of the ESA, and potentially Section 4(f) impending change and any adverse effects to the historic designation of the PAL.E South Main St District inventoried area. A vibration assessment would also be required as the site is within the residential screening distances for noise and vibration impacts.

Site C: US-20, East of Nipmuck Street

The evaluation assumed that all track and platform infrastructure would be on the south side of the CSX mainline to minimize freight operations impacts (Figure 20). Access to the parking facility would be off Park Street (US-20), and pedestrian access between the parking area and the station platform would require the construction of a pedestrian bridge across the tracks. An additional accessible pedestrian bridge is required on the other side of the platform to meet emergency egress standards.

Figure 20 Level 2 Comparative Evaluation Preliminary Concept: Site C

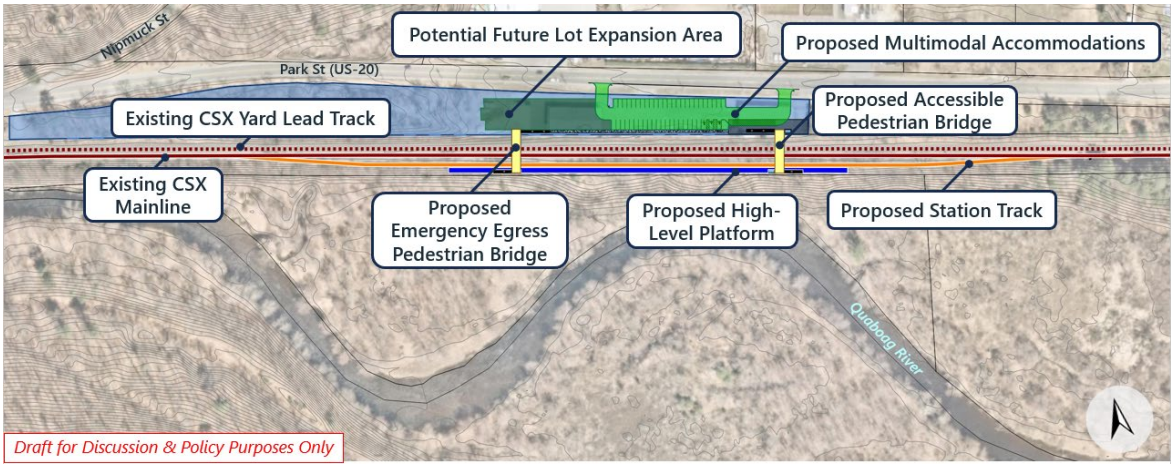


Table 26 Level 2 Comparative Evaluation Results: Engineering and Operations – Site C

Criteria	Rating	Detail
Anticipated Horizontal Curvature	Favorable	› Site C is on a tangent segment.
Anticipated Grade	Favorable	› The anticipated grade through station platform area is 0.04%.
Freight Operations Impacts	Favorable	› Minor freight impacts during construction are likely limited to construction of turnouts, construction of a pedestrian access bridge, and mainline speed restrictions. › No permanent freight impacts are anticipated.

Table 27 Level 2 Comparative Evaluation Results: Environment – Site C

Criteria	Rating	Detail
Within WPA Wetland Resource Areas	Unfavorable	› The site is within the 200-foot RFA associated with the Quaboag River, the 100-foot buffer associated with BVW and bank; and the Federal Emergency Management Agency (FEMA) 100-year floodplain. › Filing of an NOI with the Palmer Conservation Commission would be anticipated. › May require a variance for fill within wetlands if the proposed fill would exceed 5,000 square feet. › If work were to occur within the FEMA 100-year floodplain, compensatory flood storage volume would be required, and mitigation for impacts to bordering lands subject to flooding may be required.
Proximal or within a habitat of known threatened or endangered species – State or Federal	Favorable	› The federal candidate species monarch butterfly, which does not require further consultation under Section 7, may occur within the site boundary.
Use of Section 4(f) property, Section 6(f) property, or lands protected by Article 97	Favorable	› No properties protected by Section 4(f), Section 6(f), or Article 97 would be impacted.
Potential Impact to listed or known eligible Historic Resources	Neutral	› Archaeology site 19-HD-5 is recorded in the vicinity of the site, though the exact location is not available for desktop review. An archaeological study would be required.
Environmental Justice Populations within or immediately adjacent to the site	Favorable	› The site is neither adjacent to nor within an EJ population, therefore the project would cause no displacement of or direct impacts to EJ populations.
Proximal to Sensitive Noise & Vibration Receptors	Favorable	› Residential neighborhoods are located at least 450 feet from the site and would be impacted by the noise associated with a new stop such as horns and braking of trains. › A vibration assessment would be required.

Table 28 Level 2 Comparative Evaluation Results: Mobility/Access – Site C

Criteria	Rating	Detail
Non-Motorized Travel	Unfavorable	› The number of households within walking distance totals an amount less than 60% of the highest site. › Commercial space within walking distance totals an amount less than 60% of the highest site. › The number of households within biking distance totals an amount less than 60% of the highest site.
Motorized Travel	Favorable	› The number of households within 15-minute driving time totals an amount less than 60% of the highest site. › The number of households within 30-minute driving time totals an amount within 75% of the highest site.
Ability to Accommodate Vehicular Access Needs (Passenger Cars)	Favorable	› The site can accommodate expanded parking supply (at 100 spaces). › The site provides space for TNC and passenger pick up/drop-off use on-site.
Ability to Accommodate Vehicular Access Needs (Transit Shuttles)	Favorable	› The site provides curbside space for transit/shuttle bus rider pick up/drop-off and circulation. › There are no vehicle height restrictions on the primary access road.
Ability to Accommodate Pedestrian Access Needs (Walk, ADA)	Neutral	› The walking distance between passenger drop-off and the platform is less than 200'. › Vertical circulation is needed to cross the tracks to access the platform.

Table 29 Level 2 Comparative Evaluation Results: Economic Development Potential – Site C

Criteria	Rating	Detail
Conditions Supportive of TOD	Neutral	› Site C is surrounded by moderate commercial and residential uses with limited residential density and availability of properties. Mixed uses are permitted.
Conditions Supportive of Revitalization of Existing Uses	Neutral	› Site C is surrounded by a limited number of commercial and industrial construction and auto repair businesses with moderate potential for revitalization.
Consistency with Local Planning Goals	Neutral	› Aligns with the *Pioneer Valley Plan for Progress 2015-2025 Building on Success: Economic Strategies for the Region.* Additionally, the *Palmer Master Plan (2021)* includes Goal 1.1.8 Proactively prepare a Neighborhood Transit-Oriented Development Plan for the area around a preferred location for a new rail station associated with the East-West Passenger Rail Project.
Consistency with Local Zoning	Favorable	› Currently Zoned: Highway Business (HB). Underlying zoning allows for proposed site use with Town Manager approval.

Implementation Considerations

Site C requires the construction of two turnouts and the station siding track. Pedestrian access would require construction of two pedestrian bridges over the existing mainline and yard access track. Moderate civil works are also anticipated due to the existing topography of the site.

Key schedule drivers include the construction of the pedestrian bridges and environmental permitting.

Anticipated permitting requirements include:

- WPA
  - An NOI would be required as it is located within lands jurisdictional under the Act. The site is within the 200-foot RFA, and therefore would require an alternatives analysis indicating that no other alternatives are feasible for the project to proceed at this location.
  - A wetlands variance would be required if proposed fill within the wetlands exceeds 5,000 square feet. This process would require an alternatives analysis and in order for the variance to be granted, no other feasible alternatives could exist.
- Section 401/404 of the Clean Water Act
  - The proposed site may require a filing under Section 401 and Section 404 of the Clean Water Act if fill within wetlands and/or waterways is anticipated. The U.S. Army Corps of Engineers Self Verification Notification or Pre-Construction Notification may be required under Section 404. A generic Water Quality Certification (WQC) may be required under Section 401 if impacts are less than 5,000 square feet. If impacts to wetlands equal or exceed 5,000 square feet, an individual WQC may be required.
- MEPA
  - Per the 301 CMR 11.03 Review Thresholds, MEPA would potentially be required as the project could result in the alteration of 5,000 or more square feet of bordering wetlands. The project would require an ENF, as well as potentially a Draft Environmental Impact Report (DEIR), and a Final Environmental Impact Report (FEIR) if requested by MEPA.
- NEPA
  - Federal funding would require the filing of an FRA NEPA D-List CE. This would include consultation for both Section 106 of the NHPA, and Section 7 of the ESA. A vibration assessment would also be required as the site is within the residential screening distances for noise and vibration impacts.
  - A Phase 1A background literature search and site visit would be required to determine archaeological sensitivity per Section 106. If the site is determined to be moderate or high-sensitivity, limited testing would be required.

Site D: Boston Road

The evaluation assumed that all track infrastructure should be west of the Quaboag River to avoid bridge reconstruction. Per CSX standards, no part of a turnout can be located within 200 feet of a curve or railroad bridge. To meet this standard while maintaining use of #15 turnouts, the station track infrastructure and platform were shifted to the west from the preliminary sketch used in the Level 1 screening (Figure 21). Since there is insufficient tangent track to place a turnout before the curve to the west of the station platform, the station track was extended approximately 0.5 miles west to tie back into the next tangent section on the CSX mainline.

To avoid freight operations impacts, the station track and platform infrastructure are assumed to be south of the existing CSX mainline. To minimize impacts to the existing solar farm, the parking area is proposed to be in the southeast corner of the site, where there is currently vacant space, and site access from Boston Road is proposed around the solar facilities. Pedestrian access to the platform from the parking facility is proposed through an accessible pedestrian bridge across the tracks on the west side of the platform. To meet emergency egress requirements, the analysis assumed there will be a ramp to an area of refuge on the east side of the platform.

Figure 21 Level 2 Comparative Evaluation Preliminary Concept: Site D

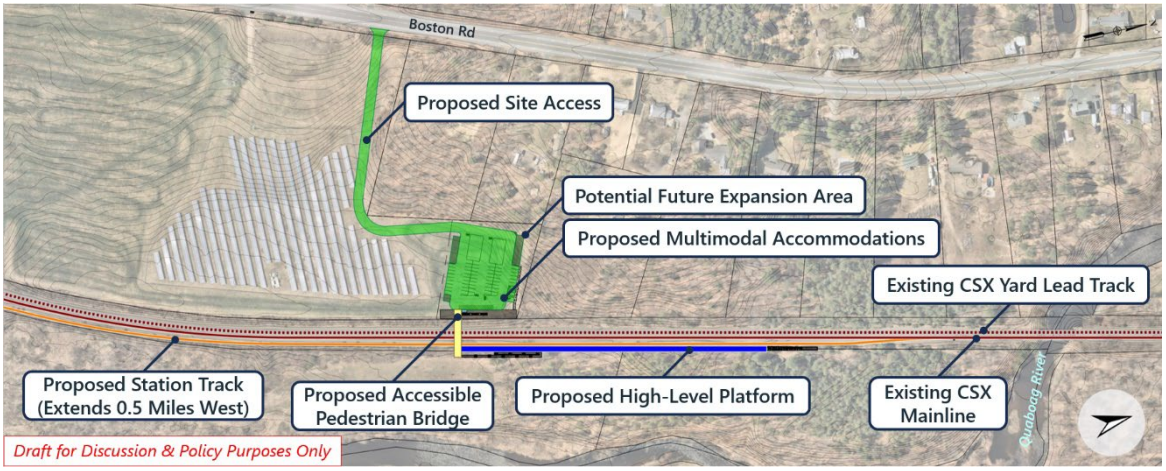


Table 30 Level 2 Comparative Evaluation Results: Engineering and Operations – Site D

Criteria	Rating	Detail
Anticipated Horizontal Curvature	Favorable	› Site D is on a tangent segment.
Anticipated Grade	Unfavorable	› The anticipated grade through station platform area is 0.68%, which is larger than the threshold of 0.3%.
Freight Operations Impacts	Favorable	› Minor freight impacts during construction are likely limited to construction of turnouts, construction of a pedestrian access bridge, and mainline speed restrictions. › No permanent freight impacts are anticipated.

Table 31 Level 2 Comparative Evaluation Results: Environment – Site D

Criteria	Rating	Detail
Within WPA Wetland Resource Areas	Neutral	› The site is within the 200-foot RFA associated with the Quaboag River, and the 100-foot buffer to the bank. › May require the filing of an RDA or NOI with the Palmer Conservation Commission.
Proximal or within a habitat of known threatened or endangered species – State or Federal	Favorable	› The federal candidate species monarch butterfly, which does not require further consultation under Section 7, may occur within the site boundary.
Use of Section 4(f) property, Section 6(f) property, or lands protected by Article 97	Favorable	› No properties protected by Section 4(f), Section 6(f), or Article 97 would be impacted.
Potential Impact to listed or known eligible Historic Resources	Favorable	› There are no listed or known eligible historic resources within or adjacent to the site.
Environmental Justice Populations within or immediately adjacent to the site	Favorable	› The site is neither adjacent to nor within an EJ population, therefore the project would cause no displacement of or direct impacts to EJ populations.
Proximal to Sensitive Noise & Vibration Receptors	Unfavorable	› Residential neighborhoods are located at least 70 feet from the site and would be impacted by the noise associated with a new stop such as horns and braking of trains. › A vibration assessment would be required.

Table 32 Level 2 Comparative Evaluation Results: Mobility – Site D

Criteria	Rating	Detail
Non-Motorized Travel	Unfavorable	› The number of households within walking distance totals an amount less than 60% of the highest site. › Commercial space within walking distance totals an amount less than 60% of the highest site. › The number of households within biking distance totals an amount less than 60% of the highest site.
Motorized Travel	Neutral	› The number of households within 15-minute driving time totals an amount less than 60% of the highest site. › The number of households within 30-minute driving time totals an amount within 60%, but less than 75%, of the highest site.
Ability to Accommodate Vehicular Access Needs (Passenger Cars)	Favorable	› The site can accommodate an expanded parking supply (at 100 spaces). › The site provides space for TNC and passenger pick up/drop-off use on-site.
Ability to Accommodate Vehicular Access Needs (Transit Shuttles)	Favorable	› The site provides curbside space for transit/shuttle bus rider pick up/drop-off and circulation. › There are no vehicle height restrictions on primary access road
Ability to Accommodate Pedestrian Access Needs (Walk, ADA)	Neutral	› Walking distance between passenger drop-off and the platform is less than 200'. › Vertical circulation is needed to cross the tracks to access the platform.

Table 33 Level 2 Comparative Evaluation Results: Economic Development Potential – Site D

Criteria	Rating	Detail
Conditions Supportive of TOD	Unfavorable	› Site D is unfavorable for TOD due to the rural residential location, lack of surrounding commercial inventory, residential density, and the possibility for mixed-uses.
Conditions Supportive of Revitalization of Existing Uses	Unfavorable	› Site D is not proximate to any commercial uses with the potential for revitalization.
Consistency with Local Planning Goals	Neutral	› Aligns with the *Pioneer Valley Plan for Progress 2015-2025 Building on Success: Economic Strategies for the Region*. Additionally, the *Palmer Master Plan (2021)* includes Goal 1.1.8 Proactively prepare a Neighborhood Transit-Oriented Development Plan for the area around a preferred location for a new rail station associated with the East-West Passenger Rail Project.
Consistency with Local Zoning	Unfavorable	› Currently Zoned: Rural Residential (RR). Site D requires rezoning to HB, GB, or NB and Town Manager Approval without a reasonable argument.

Implementation Considerations

Site D requires the construction of two turnouts and the extended station siding track. Pedestrian access would require the construction of a pedestrian bridge across the existing yard access track and mainline. Moderate civil works are also anticipated due to the existing site topography.

Key schedule drivers include pedestrian bridge construction.

Anticipated permitting requirements include:

- WPA
  - An NOI would be required as it is located within lands jurisdictional under the Act. The site is within the 200-foot RFA, and therefore would require an alternatives analysis indicating that no other alternatives are feasible for the project to proceed at this location.
- NEPA
  - Federal funding would require the filing of an FRA NEPA D-List CE. This would include consultation for both Section 106 of the NHPA, and Section 7 of the ESA. A vibration assessment would also be required as the site is within the residential screening distances for noise and vibration impacts.

Site F: Palmer Department of Public Works

To avoid interference with the CP-83 diamond junction, the evaluation placed the station infrastructure west of the existing signal. The evaluation assumed that the station siding track would be south of the realigned CSX mainline track based on curvature and right-of-way constraints. The station platform and track infrastructure would be separated from the station facility infrastructure by the Quaboag River, and the existing bridge would need to be reconstructed to accommodate the station track and pedestrian access.

To minimize interference with freight operations during construction, the evaluation assumed that the new realigned mainline would be constructed while maintaining service on the existing mainline, a new railroad bridge would be constructed north of the existing bridge to support the new mainline, and the existing railroad bridge could be repurposed to provide pedestrian access across the Quaboag River. To accommodate the proposed bridge reconstruction staging, the concept (Figure 22) shifted the mainline realignment further north compared to the Level 1 preliminary sketch (Figure 13). Due to track geometry limitations, the station track and platform infrastructure were also shifted further west to where the realigned mainline provides sufficient tangent track to accommodate the station siding track.

Due to environmental constraints, the analysis assumed that the station parking facility would be placed in the eastern corner of the site, outside of the 200-foot regulatory floodway area. The evaluation assumed that site access would be provided from Bridge Street, and pedestrian access to between the parking facility and the platform would be provided through a walkway across the river. A ramp to an area of refuge is proposed to the west side of the platform for emergency egress.

Figure 22 Level 2 Comparative Evaluation Preliminary Concept: Site F

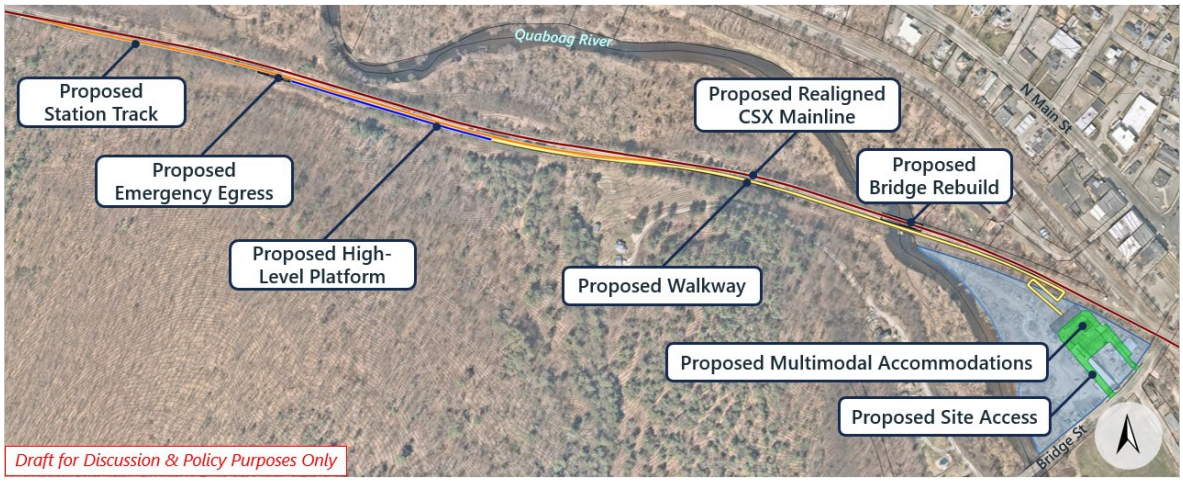


Table 34 Level 2 Comparative Evaluation Results: Engineering and Operations – Site F

Criteria	Rating	Detail
Anticipated Horizontal Curvature	Neutral	› Site F is on a curve of 1°.
Anticipated Grade	Neutral	› The anticipated grade through the station platform area is 0.29%.
Freight Operations Impacts	Unfavorable	› Major freight impacts are anticipated during construction due to mainline realignment and bridge reconstruction in an existing single track segment. › Minor permanent freight impacts are anticipated due to realignment of the CSX mainline. › There is the potential for minor permanent freight benefits with the reconstruction of the rail bridge over the Quaboag River.

Table 35 Level 2 Comparative Evaluation Results: Environment – Site F

Criteria	Rating	Detail
Within WPA Wetland Resource Areas	Unfavorable	› The site is within the 200-foot RFA associated with the Quaboag River, the 100-foot buffer to BVW and bank, land under water, and the FEMA 100-year floodplain. › Filing of a NOI with the Palmer Conservation Commission would be required. › Wetland variance may be required if fill within wetlands and/or waterways exceeds 5,000 square feet.
Proximal or within a habitat of known threatened or endangered species – State or Federal	Favorable	› The federal candidate species monarch butterfly, which does not require further consultation under Section 7, may occur within the site boundary.
Use of Section 4(f) property, Section 6(f) property, or lands protected by Article 97	Favorable	› No properties protected by Section 4(f), Section 6(f), or Article 97 would be impacted.
Potential Impact to listed or known eligible Historic Resources	Neutral	› The site is adjacent to one National Register of Individual Properties: PAL.275 (Palmer Union Station). › The site is also adjacent to numerous unevaluated resources including PAL.B (Palmer Downtown District) and its contributing resources PAL.260 (Burley and Keyes Lumber and Carpentry Shop) and PAL.261 (34 Foundry St). › Adverse effects would not be anticipated as the project would be consistent with the existing use of the rail corridor.
Environmental Justice Populations within or immediately adjacent to the site	Neutral	› The site is within an EJ population, but the project is not expected to displace or impact EJ Populations.
Proximal to Sensitive Noise & Vibration Receptors	Neutral	› Residential neighborhoods are located at least 250 feet from the site and would be impacted by the noise associated with a new stop such as horns and braking of trains. › A vibration assessment would be required.

Table 36 Level 2 Comparative Evaluation Results: Mobility – Site F

Criteria	Rating	Detail
Non-Motorized Travel	Favorable	› The number of households within walking distance of the site totals the highest among the sites. › Commercial space within walking distance of the site totals the highest among the sites. › The number of households within biking distance of the site totals the highest among the sites.
Motorized Travel	Favorable	› The number of households within 15-minute driving time totals an amount within 60%, but less than 75%, of the highest site. › The number of households within 30-minute driving time totals an amount within 75% of highest site.
Ability to Accommodate Vehicular Access Needs (Passenger Cars)	Favorable	› The site can accommodate an expanded parking supply (at 100 spaces). › The site provides space for TNC and passenger pick up/drop-off use on-site.
Ability to Accommodate Vehicular Access Needs (Transit Shuttles)	Neutral	› The site provides curbside space for transit/shuttle bus rider pick up/drop-off and circulation. › A nearby bridge underpass (Bridge Street) has a height restriction of 10′6″.
Ability to Accommodate Pedestrian Access Needs (Walk, ADA)	Unfavorable	› Walking distance between passenger drop-off and the platform is greater than 315′. › Vertical circulation via long ramps is needed to access the platform.

Table 37 Level 2 Comparative Evaluation Results: Economic Development Potential – Site F

Criteria	Rating	Detail
Conditions Supportive of TOD	Neutral	› Site F offers moderate potential, proximate to existing and available commercial properties and dense residential development near Main Street and the Historic Palmer Depot. Mixed uses are not allowed.
Conditions Supportive of Revitalization of Existing Uses	Favorable	› Site F is proximate to commercial and residential development with the potential for revitalization.
Consistency with Local Planning Goals	Favorable	› Aligns with The *Palmer Master Plan* (2021) Goal 1.1.7 to understand and prioritize development and adaptive reuse/redevelopment opportunities.
Consistency with Local Zoning	Neutral	› Currently Zoned: Town Residential (TR). Site F has a reasonable argument for rezoning to GB and Town Manager Approval.

Implementation Considerations

In addition to the construction of two turnouts and a station siding, Site F requires major track realignment of the CSX mainline and reconstruction of the Quaboag River railroad bridge. Pedestrian access would require the construction of a pedestrian bridge and an extensive walkway and ramp system. Major civil works are anticipated due to existing site topography.

Key schedule drivers include the track realignment, railroad bridge reconstruction, environmental permitting, and the design and engineering complexity.

Anticipated permitting requirements include:

- WPA
  - An NOI would be required as the site is located within lands jurisdictional under the Act. The site is within the 200-foot RFA, and therefore would require an alternatives analysis indicating that no other alternatives are feasible for the project to proceed at this location.
  - A wetland variance would be required if proposed fill within the wetlands exceeds 5,000 square feet. This process would require an alternatives analysis and in order for the variance to be granted, no other feasible alternatives could exist.
- Section 401/404 of the Clean Water Act
  - May require filing under sections 401 and 404 of the Clean Water Act if fill within wetlands and/or waterways is anticipated. U.S. Army Corps of Engineers Self Verification Notification or Pre-Construction Notification may be required under Section 404. A generic Water Quality Certification (WQC) may be required under Section 401 if impacts are less than 5,000 square feet. If impacts to wetlands equal or exceed 5,000 square feet, an individual WQC may be required.
- Massachusetts General Law Chapter 91
  - Filing under Chapter 91 may be required. If the project requires permitting under Chapter 91, a new license or minor modification of an existing license may be required.
- U.S. Army Corps of Engineers (USACE) Approval/Section 10
  - The project may require authorization of the USACE under Section 10 due to the potential to impact navigable waters.
- MEPA
  - Per the 301 CMR 11.03 Review Thresholds, MEPA would potentially be required as the project could result in the alteration of 5,000 or more square feet of bordering wetlands. The project would require an ENF, as well as potentially a DEIR, and a FEIR if determined by MEPA.
- NEPA
  - Federal funding would require the filing of an FRA NEPA D-List CE. This would include consultation for both Section 106 of the NHPA, and Section 7 of the ESA. A vibration assessment would also be required as the site is within the residential screening distances for noise and vibration impacts.

Site I: North of Palmer Yard

To avoid impacts on Palmer Yard freight operations, the evaluation assumed that the station siding track and platform would be configured on the south side of Palmer Yard, in the same location as for Site B. An unnamed stream runs through the eastern parcel initially identified as part of Site I. To avoid potential environmental impacts, the parking facility and multimodal accommodations are assumed to be on the western parcel, with access from Park Street (US-20) (Figure 23). Pedestrian access between the multimodal accommodations and the station platform would be provided through an accessible pedestrian bridge over the yard, and an additional ramp between the east side of the platform and Stone Street is proposed to meet emergency egress requirements.

Figure 23 Level 2 Comparative Evaluation Preliminary Concept: Site I

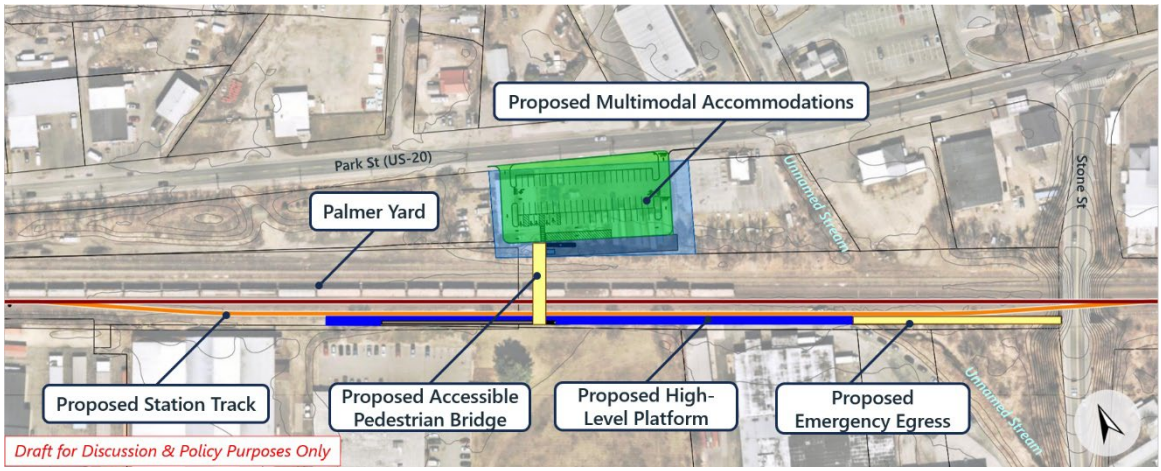


Table 38 Level 2 Comparative Evaluation Results: Engineering and Operations – Site I

Criteria	Rating	Detail
Anticipated Horizontal Curvature	Favorable	› Site I is on a tangent segment.
Anticipated Grade	Neutral	› The anticipated grade through the station platform area is 0.29%.
Freight Operations Impacts	Unfavorable	› Major freight impacts are anticipated during construction due to construction of the pedestrian access bridge over Palmer Yard tracks. › Moderate permanent freight impacts are anticipated due to the relocation of the infrequently used existing siding track south of the mainline

Table 39 Level 2 Comparative Evaluation Results: Environment – Site I

Criteria	Rating	Detail
Within WPA Wetland Resource Areas	Neutral	› The platform is located within the 200-foot RFA of a perennial stream and 100-foot buffer from the stream bank. › Filing of an NOI with the Palmer Conservation Commission would be anticipated.
Proximal or within a habitat of known threatened or endangered species – State or Federal	Favorable	› The federal candidate species monarch butterfly, which does not require further consultation under Section 7, may occur within the site boundary.
Use of Section 4(f) property, Section 6(f) property, or lands protected by Article 97	Neutral	› If the PAL.E South Main St District inventoried area is determined to be eligible for the National Historic Register, then there is potential for it to be considered a 4(f) resource (see below) and Section 4(f) consultation may be required.
Potential Impact to listed or known eligible Historic Resources	Neutral	› The site is within the PAL.E South Main St District inventoried area. The last issued opinion by the MHC was in the 1980s, and there is potential for the inventoried area to be recategorized as eligible for the National Historic Register. › Adverse effects would not be anticipated as the project would be consistent with the existing use of the rail corridor.
Environmental Justice Populations within or immediately adjacent to the site	Favorable	› The site is neither adjacent to nor within an EJ population, therefore the project would cause no displacement of or direct impacts to EJ populations.
Proximal to Sensitive Noise & Vibration Receptors	Favorable	› Residential neighborhoods are located at least 500 feet from the site and would be impacted by the noise associated with a new stop such as horns and braking of trains. › A vibration assessment would be required.

Table 40 Level 2 Comparative Evaluation Results: Mobility – Site I

Criteria	Rating	Detail
Non-Motorized Travel	Favorable	› The number of households within walking distance totals an amount less than 60% of the highest site. › Commercial space within walking distance totals an amount less than 60% of the highest site. › The number of households within biking distance totals an amount within 75% of the highest site.
Motorized Travel	Favorable	› The number of households within 15-minute driving time totals an amount within 60%, but less than 75%, of the highest site. › The number of households within 30-minute driving time totals an amount within 75% of the highest site.
Ability to Accommodate Vehicular Access Needs (Passenger Cars)	Neutral	› The site can accommodate the minimum number of spaces (45 spaces), but not the minimum expanded parking supply target of 100 spaces. › The site provides space for TNC and passenger pick up/drop-off use on-site.
Ability to Accommodate Vehicular Access Needs (Transit Shuttles)	Favorable	› The site provides curbside space for transit/shuttle bus rider pick up/drop-off and circulation. › The are no vehicle height restrictions on the primary access road.
Ability to Accommodate Pedestrian Access Needs (Walk, ADA)	Neutral	› Walking distance between passenger drop-off and the platform is less than 200'. › Vertical circulation is needed to cross the tracks to access the platform.

Table 41 Level 2 Comparative Evaluation Results: Economic Development Potential – Site I

Criteria	Rating	Detail
Conditions Supportive of TOD	Favorable	› Site I supports potential TOD due to surrounding commercial and industrial uses, density of residential development, and the allowance of mixed-uses.
Conditions Supportive of Revitalization of Existing Uses	Neutral	› Site I is surrounded by existing commercial and industrial uses with the potential for revitalization.
Consistency with Local Planning Goals	Neutral	› Aligns with the *Pioneer Valley Plan for Progress 2015-2025 Building on Success: Economic Strategies for the Region*. Additionally, the *Palmer Master Plan (2021)* includes Goal 1.1.8 Proactively prepare a Neighborhood Transit-Oriented Development Plan for the area around a preferred location for a new rail station associated with the East-West Passenger Rail Project.
Consistency with Local Zoning	Favorable	› Currently Zoned: Highway Business (HB). Underlying zoning allows for proposed site use with Town Manager approval.

Implementation Considerations

Site I requires the construction of two turnouts and the station siding track as well as relocation of the existing siding track. Pedestrian access would require construction of a pedestrian bridge across Palmer Yard. Minor civil works are anticipated.

Key schedule drivers include the construction of the pedestrian bridge and environmental permitting.

Anticipated permitting requirements include:

- WPA
  - An NOI would be required as it is located within lands jurisdictional under the Act. The site is within the 200-foot RFA, and therefore would require an alternatives analysis indicating that no other alternatives are feasible for the project to proceed at this location.
- NEPA
  - Federal funding would require the filing of an FRA NEPA D-List CE. This would include consultation for both Section 106 of the NHPA, and Section 7 of the ESA, and potentially Section 4(f) impending change to the historic designation of, and adverse effects to the PAL.E South Main St District inventoried area. A vibration assessment would also be required as the site is within the residential screening distances for noise and vibration impacts.

Summary

Table 42 provides a summary of results of the Level 2 Comparative Evaluation performed on the six sites advanced from Level 2 Comparative Evaluation. Each criterion is included as a row, and each site is included as a column, with symbols representing the ratings. A solid green circle represents a favorable rating, a half-filled orange circle represents a neutral rating, and a hollow red circle represents an unfavorable rating.

Table 43 summarizes the implementation considerations of each site. Key cost elements, major schedule drivers, and anticipated permitting requirements are included as rows, and each site is included as a column, with bar shading representing the comparative ratings. Bar length is used to reflect comparative differences in key cost elements across sites, with full bars representing the highest cost alternatives. Full bars are used where major schedule drivers are present for each site, and where permitting is anticipated for each site.

Table 42 Summary of Level 2 Comparative Evaluation

Criteria	Site A	Site B	Site C	Site D	Site F	Site I
Engineering and Operations						
Anticipated Horizontal Curvature	Favorable	Favorable	Favorable	Favorable	Neutral	Favorable
Anticipated Grade through Platform Area	Unfavorable	Neutral	Favorable	Unfavorable	Neutral	Neutral
High-Level Assessment of Freight Operations Impacts	Favorable	Neutral	Favorable	Favorable	Unfavorable	Unfavorable
Environment						
Within WPA Wetland Resource Area	Neutral	Neutral	Unfavorable	Neutral	Unfavorable	Neutral
Proximal or Within Endangered Species Habitats	Unfavorable	Favorable	Favorable	Favorable	Favorable	Favorable
Potential "Use" of Publicly-Owned/Accessible Park, Open Space, Recreation Resources	Favorable	Neutral	Favorable	Favorable	Favorable	Neutral
Potential Impacts to Nationally-Listed or Known Eligible Historic Resources	Neutral	Neutral	Neutral	Favorable	Neutral	Neutral
Within or Immediately Adjacent to EJ Populations	Favorable	Favorable	Favorable	Favorable	Neutral	Favorable
Proximity to Sensitive Noise & Vibration Receptors	Unfavorable	Favorable	Favorable	Unfavorable	Neutral	Favorable
Mobility						
Non-Motorized Travel (Walk and Bike Access)	Unfavorable	Favorable	Unfavorable	Unfavorable	Favorable	Favorable
Motorized Travel (Drive Access)	Favorable	Favorable	Favorable	Neutral	Favorable	Favorable
Ability to Accommodate Vehicular Access Needs (Passenger Cars)	Favorable	Favorable	Favorable	Favorable	Favorable	Neutral
Ability to Accommodate Vehicular Access Needs (Transit Shuttles)	Neutral	Favorable	Favorable	Favorable	Neutral	Favorable
Ability to Accommodate Pedestrian Access Needs (Walk, ADA)	Favorable	Favorable	Neutral	Neutral	Unfavorable	Neutral
Economic Development Potential						
Conditions Supportive of TOD	Unfavorable	Favorable	Neutral	Unfavorable	Neutral	Favorable
Conditions Supportive of Revitalization of Existing Uses	Unfavorable	Neutral	Neutral	Unfavorable	Favorable	Neutral
Consistency with Local Planning Goals	Unfavorable	Neutral	Neutral	Neutral	Favorable	Neutral
Consistency with Local Zoning	Unfavorable	Neutral	Favorable	Unfavorable	Neutral	Favorable

- Favorable
- Neutral
- Unfavorable

Table 43 Summary of Level 2 Comparative Evaluation – Implementation Considerations

Criteria	Site A	Site B	Site C	Site D	Site F	Site I
Key Cost Elements						
Trackwork						
Railroad Bridge Construction						
Pedestrian Access						
Civil Works						
Major Schedule Drivers						
CSX Mainline Realignment						
Railroad or Pedestrian Bridge Construction						
Design and Engineering Complexity						
Land Acquisition						
Construction in Municipalities Outside of Palmer						
Anticipated Permitting						
Wetlands Notice of Intent/Section 401						
Wetlands Variance						
Massachusetts Environmental Policy Act (MEPA)						
MESA Regulatory Review						
Archeological Study						
FRA NEPA Documented Categorical Exclusion/Section 106						
Chapter 91						
USACE Approval/Section 10						
Section 404						

Public Input Received

A public meeting was held at the Palmer Public Library to present the alternatives analysis and solicit feedback to further inform the site selection. Following a presentation on the two-tiered alternatives analysis approach and results, two breakout sessions invited attendees to provide input on the alternatives analysis and station design. Verbal comments were collected through discussions during these breakout sessions, and comment forms provided participants the opportunity to leave written feedback. Individuals unable to attend the meeting were invited to submit comments and questions electronically.

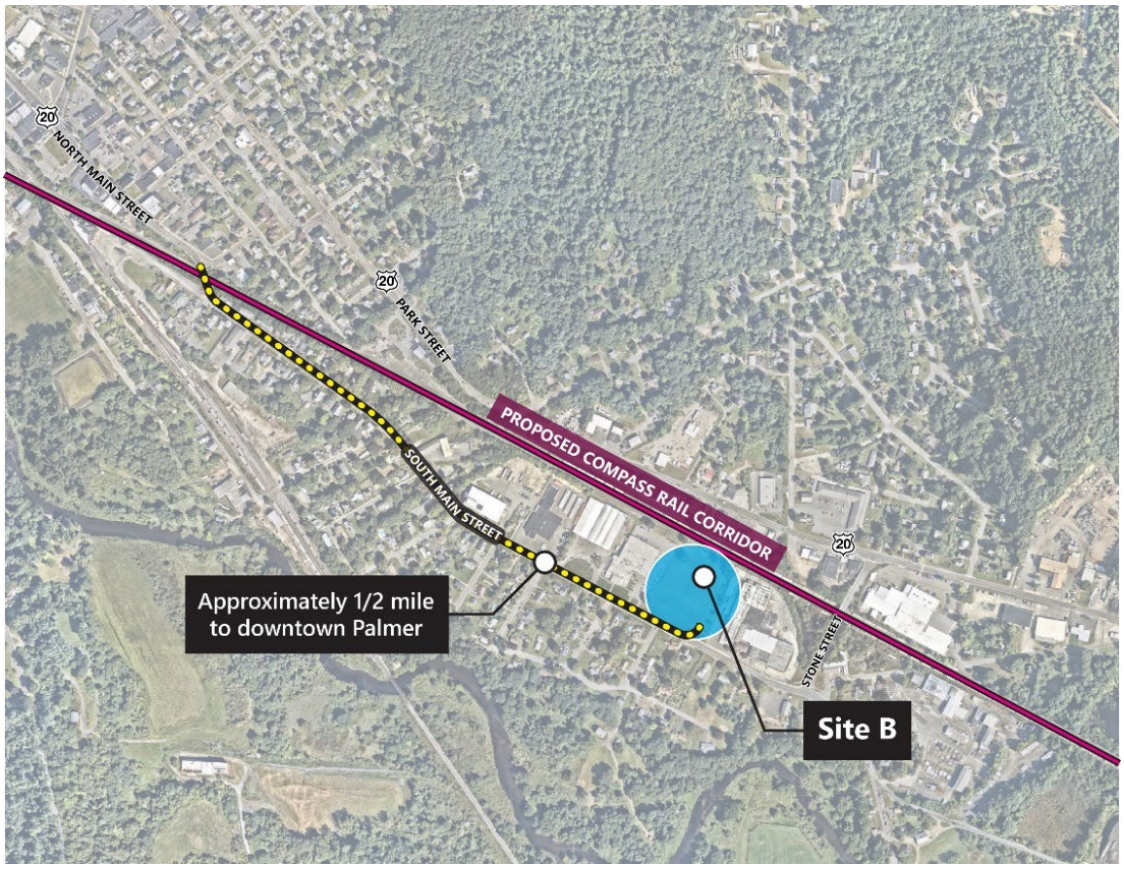
Many comments expressed desire for a station location close to the Palmer downtown and concern over accessibility. Appendix A provides a full summary of public comments received.

Photo of MassDOT West-East Rail Director Andy Koziol presenting at the public meeting held in December 2024.

Site Selected to Advance to Conceptual Design

Based on the Level 2 Comparative Evaluation and public input, Site B (South of Palmer Yard) resulted in the most favorable evaluation. Based on the Level 2 Comparative Evaluation, Site B appears to be the least costly and most straightforward to construct and is among the sites with the least anticipated permitting. Of the sites included in the Level 2 Comparative Evaluation, public feedback also seems to favor Site B for its relative proximity to downtown and simplicity. Municipal stakeholder feedback largely expressed the same sentiment, with a focus on the purpose to achieve passenger rail service in Palmer. The Level 2 Comparative Evaluation recommends Site B to advance to Conceptual Design. Figure 24 depicts Site B in the context of its proximity to downtown Palmer.

Figure 24 Site Selected to Advance to Conceptual Design



Site B is located on an 8-acre parcel at 1199 South Main Street. The parcel is owned and partially occupied by Sanderson Macleod Inc., a local twisted wire brush manufacturer. To avoid impacts to the two existing buildings occupying the western part of the parcel, Site B would utilize the unoccupied eastern portion. The station siding track is proposed to be south of the CSX mainline, requiring that the existing siding track be relocated. Multimodal access to the site would be from South Main Street, and accommodations for parking, passenger pick-up/drop-off, and transit connections would be installed just south of the platform area. There is ample space for future expansion toward the south side of the parcel. Sloped walkways on either side of the platform would provide pedestrian access and egress pathways between the platform and the parking area.

Although not advanced to Conceptual Design, Site I would utilize a similar configuration, with the same station track and platform locations. While the analysis and municipal stakeholder committee identified that Site I may provide more adjacent development potential due to its proximity to vacant and underutilized properties on US-20, MassDOT and the municipal stakeholder committee have selected Site B to advance to conceptual design instead of Site I for the following reasons:

- Pedestrian access for Site I would need to be provided between the platform on the south side of Palmer Yard and the station multimodal accommodations at Site I on the north side of Palmer Yard. This would require the construction of a pedestrian bridge for Site I, which would not be required for access to Site B. Construction of the pedestrian bridge over the Palmer Yard for Site I would:
  - Require additional coordination with CSX, resulting in additional implementation complexity, with potential for an increased duration of planning and construction.
  - Result in a greater cost for the station infrastructure.
  - Reduce the convenience for users accessing the station by vehicle (including personal vehicles or transit) by requiring them to cross the pedestrian bridge instead of accessing the site at grade.
- While Site I can accommodate the minimum number of spaces defined for the purpose of the alternatives analysis (45 spaces), it could not accommodate an expanded parking supply target of 100 spaces. Site B has the potential to accommodate both the minimum number of spaces defined for the purpose of the alternatives analysis and an expanded supply of at least 100 spaces.