MORPC Rapid Speed Transportation Initiative

Draft Route Alternatives Report

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MORPC
MID-OHIO REGIONAL PLANNING COMMISSION

Table of Contents

1.0 Introduction 1
1.1. Background on RSTI Passenger Rail Project 1
1.2. Purpose of Report 1
2.0 Preliminary Route Alternatives Identification 2
2.1. Tolleston to Lima 6
2.2. Lima to Dunkirk to Kenton 6
2.3. Lima to Kenton 7
2.4. Kenton to Marysville to Columbus 7
2.5. Columbus – North 7
2.6. Columbus – South 8
2.7. Columbus to Mingo Junction 8
2.8. Mingo Junction – Northern Alignment 8
2.9. Mingo Junction – Southern Alignment 9
2.10. Mingo Junction to Pittsburgh – North A 9
2.11. Mingo Junction to Pittsburgh – North B 10
2.12. Mingo Junction to Pittsburgh – South 10
2.13. Kirwan Heights to Dawn Station 10
2.14. Kirwan Heights to Ohio Connecting Bridge 11
2.15. Pittsburgh – Ohio River West Lower 11
2.16. Pittsburgh – Ohio River West Upper 11
2.17. Pittsburgh – Downtown to Carnegie Mellon 12
2.18. Pittsburgh – Downtown 12
3.0 Screening Criteria 12
3.1. Route Screening Criteria 12
3.2. Station Screening Criteria 14
4.0 Initial Screening/Evaluation of Route Alternatives 16
4.1. Route Alternatives Screening 16
4.2. Station Alternatives Screening 25
5.0 Findings/Results of Initial Screening 28
5.1. Potential Route Alternatives 28
5.2. Potential Station Locations 31

6.0 Next Steps 36
Appendix A 37
Alternative Rail Segment Attributes 37
Appendix B 39
Northern Indiana Passenger Rail Corridor – Route Alternatives Analysis Report 39

Figures

Figure 1: RSTI Lima to Pittsburgh Alternative Rail Alignments 4
Figure 2: Northern Indiana Passenger Rail Corridor Alternatives 5
Figure 3: Alternative Rail Segments and Train Volumes 30

Tables

Table 1. Referenced Railroad Timetables 3
Table 2. Potential Station Cities, Population, and Distance 25
Table 3. Amtrak Lincoln Service Station Cities, Population, and Distance 26
Table 4. Amtrak Missouri River Runner Service Station Cities, Population, and Distance 27
Table 5: Alternative Corridor Alignments and Attributes 28

1.0 Introduction

1.1. Background on RSTI Passenger Rail Project

The Rapid-Speed Transportation Initiative (RSTI) is an exploration by the Mid-Ohio Regional Planning Commission, MORPC, to provide new intercity transportation for central Ohio. More specifically, the RSTI corridor focuses on intercity passenger transportation alternatives on the Chicago to Pittsburgh corridor and is parsed into two primary segments – Chicago to Lima and Lima to Pittsburgh. The RSTI includes the investigation of hyperloop alignments in addition to intercity passenger rail alignments. This report primarily focuses on the Lima to Pittsburgh corridor segment and the exploration of intercity passenger rail alternative alignments. The previously studied Chicago to Lima segment of the corridor is also described in this report for reference. Collectively, the two segments are intended to serve as an integrated transportation corridor connecting Chicago, Columbus, Pittsburgh, and various intermediate communities.

1.2. Purpose of Report

This report is intended to serve as the route alternatives identification and screening record for the Lima to Pittsburgh segment of the RSTI corridor, focusing on intercity passenger rail technology. Previously, the Chicago to Lima segment was studied by HNTB as part of the Northern Indiana Passenger Rail Corridor Study in which 3 route alternatives were identified, evaluated, and ultimately one route recommended for further consideration. The Northern Indiana Passenger Rail Corridor Route Alternatives Analysis Report is included in Appendix B of this report.

This report follows previous tasks in which corridor data was collected and the project's purpose and need was defined. This report identifies reasonable rail alignment and station alternatives based on existing right-of-way (ROW), physical infrastructure conditions, and operational characteristics. To further refine the alternatives and identify alternatives that are consistent with the project's purpose and need, screening criteria are used to evaluate both route and station alternatives. The report culminates with the screened route and station alternatives that are consistent with the project's goals and objectives and the necessary next steps to further the planning process.

2.0 Preliminary Route Alternatives Identification

The following route alternatives were identified based on existing rail ROW and physical characteristics. Physical attributes considered were the directness of the route or route circuity, existing track speeds, existing train volumes, and ROW ownership. Other information collected includes the number of at-grade crossings, number of bridges, underpasses, and tunnels, and track capacity.

See Figure 1 for a corresponding map of alternative Lima to Pittsburgh rail alignments discussed in this section.

The first segment discussed under section 2.1, describes the Chicago to Lima route alternatives and stations as identified and evaluated in the Northern Indiana Passenger Rail Corridor Study by HNTB. More specifically, this segment focuses on the Tolleston, IN to Lima, OH portion of the route. The Chicago Union Station to Tolleston segment was one of four previously evaluated alternatives as part of the Chicago-Detroit/Pontiac Passenger Rail Corridor Program Tier 1 EIS commissioned by the Michigan Department of Transportation. The Chicago Union Station to Tolleston "South of the Lake" corridor identified in that report is the assumed connecting alignment for the Tolleston to Lima segment in the Northern Indiana Passenger Rail Corridor Study.

See Figure 2 for the Northern Indiana Passenger Rail Corridor alternatives between Tolleston, IN and Lima, OH.

To describe the Lima to Pittsburgh corridor route alternatives, the corridor is parsed into several route segments based on the presence of existing rail corridors, key interlockings or junctions, and the presence of alternative parallel corridors. Corridor segments that feature a single route alignment are indicative of limited route alternatives and/or stakeholder expressed interest in a preferred alignment based on existing condition attributes. Corridor segments that feature multiple route alignments present feasible alternatives for future planning consideration. Future end-to-end alternatives will be analyzed in future environmental analysis efforts and screening.

Note:

Corridor ownership, line names, track speeds, track capacity, and train volume information was collected from available railroad timetables. Most rail segments are freight exclusive and only detail posted freight speeds. Passenger speeds are interpreted from posted freight speeds based on Federal Railroad Administration (FRA) track classification protocols and assumptions.

Table 1. Referenced Railroad Timetables

Timetable	Railroad Subdivision/Line	Corresponding Route Alternative
Chicago, Fort Wayne & Eastern Railroad	Lima Subdivision	Lima to Dunkirk to Kenton
CSX Great Lakes Division	Toledo Subdivision Scottslawn Secondary Scottslawn Secondary	Lima to Dunkirk to Kenton Kenton to Marysville to Columbus – South
CSX Baltimore Division	Pittsburgh Subdivision P&W Subdivision W&P Subdivision Pittsburgh Subdivision – PI	Mingo Junction to Pittsburgh – North A Pittsburgh – Downtown to Carnegie Mellon Pittsburgh – Ohio River West Lower
Norfolk Southern Lake Division	Buckeye Terminal Buckeye Terminal Buckeye Terminal Buckeye Branch	Columbus – South Columbus – North Columbus to Mingo Junction Columbus – North
Norfolk Southern Pittsburgh Division	Weirton Secondary Weirton Secondary Pittsburgh Subdivision – River Line Pittsburgh Subdivision – Cleveland Line Pittsburgh Subdivision – Fort Wayne Line Pittsburgh Subdivision – Fort Wayne Line Carnegie IT Pittsburgh Subdivision – Pittsburgh Line Pittsburgh Subdivision – Mon Line	Mingo Junction to Pittsburgh – North A Mingo Junction to Pittsburgh – North B Pittsburgh – Downtown Kirwan Heights to Ohio Connecting Bridge Pittsburgh – Downtown to Carnegie Mellon Pittsburgh – Ohio River West Upper
Genesee & Wyoming Ohio Central System Southern Lines	C&N Subdivision Pan Subdivision	Columbus to Mingo Junction Columbus to Mingo Junction Mingo Junction – Northern Alignment
Wheeling & Lake Erie	Rook Subdivision Rook Subdivision Pittsburgh Subdivision	Mingo Junction – Southern Alignment Mingo Junction to Pittsburgh – South Kirwan Heights to Dawn

All at-grade crossing data and grade separated data (bridges, underpasses, and tunnels) were collected from the Federal Railroad Administration's Highway-Rail Crossing Inventory Data. This information only includes facilities that feature road and rail crossings. Other facilities or structures such as rail crossings over other rail lines (at-grade diamonds or bridges), waterbody crossings, or other geographic feature crossings (such as culverts or low-lying geographic depressions), are not included.

Where track speed and train volume information was not available in railroad timetables, the Federal Railroad Administration's Highway-Rail Crossing Inventory Data was used to supply this information.

Figure 1: RSTI Lima to Pittsburgh Alternative Rail Alignments



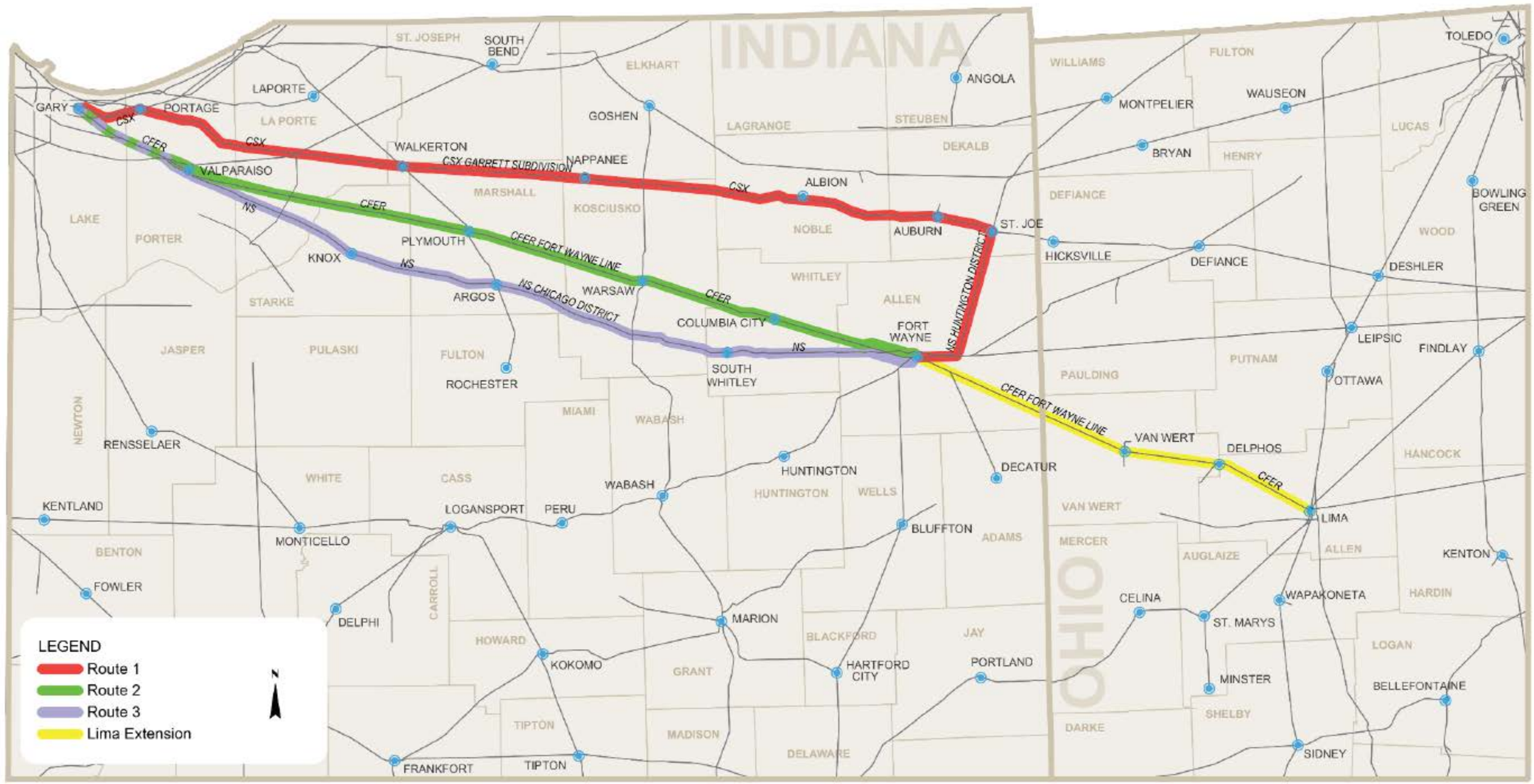
Alternative Rail Segments & Stations

- Potential station locations
- Lima to Dunkirk to Kenton
- Kenton to Marysville to Columbus
- Columbus - North
- Columbus - South
- Columbus to Mingo Junction
- Mingo Junction - North
- Mingo Junction - South
- Mingo Junction to Pittsburgh - North A
- Mingo Junction to Pittsburgh - North B
- Mingo Junction to Pittsburgh - South
- Pittsburgh - Downtown
- Pittsburgh - Downtown to Carnegie Mellon
- Pittsburgh - Ohio River West Lower
- Pittsburgh - Ohio River West Upper
- Kirwan Heights to Dawn
- Kirwan Heights to Ohio Connecting Bridge

Other Map Features

- Other rail lines
- Interstate highway
- US highway
- State road
- Parks
- Rivers, streams, and waterbodies
- Census designated urbanized areas (UZA)
- Census places (incorporated areas)

Figure 2: Northern Indiana Passenger Rail Corridor Alternatives



2.1. Tolleston to Lima

The Northern Indiana Passenger Rail Corridor Route Alternatives Analysis Report identified 3 Tolleston to Lima route alternatives and evaluated them by considering communities served, route lengths, and existing freight traffic and track capacity limitations.

Route 1 is 213 miles in length and comprised of 4 ownership segments – Tolleston to Portage, part of CSX's Porter Subdivision, Portage to St. Joe, part of CSX's Garrett Subdivision, St. Joe to Fort Wayne, part of Norfolk Southern's Huntington District, and Fort Wayne to Lima, part of Chicago, Ft. Wayne & Eastern Railroad's (CFER) Fort Wayne Line. Route 1 directly serves the cities of Gary, Fort Wayne, and Lima, however the cities of Valparaiso, Plymouth, and Warsaw are not located on the alignment. This route alternative is the longest of the three and features the highest freight volumes.

Route 2 is 182 miles in length and is part of the Chicago, Ft. Wayne & Eastern Railroad's Fort Wayne Line. Route 2 directly serves Gary, Fort Wayne, and Lima in addition to Valparaiso, Plymouth, and Warsaw. This route alternative is the shortest alignment and features lower freight volumes.

Route 3 is 182 miles in length and comprised of 3 ownership segments – Tolleston to Spriggsboro, past of Chicago, Ft. Wayne & Eastern Railroad's Fort Wayne Line, Spriggsboro to Fort Wayne, part of Norfolk Southern's Chicago District, and Fort Wayne to Lima, part of Chicago, Ft. Wayne & Eastern Railroad's Fort Wayne Line. Route 3 directly serves Gary, Fort Wayne, and Lima in addition to Valparaiso, however Plymouth and Warsaw are not located on the alignment. This route alternative features moderate to high freight volumes.

Route 2 was identified as the recommended route alternative as it best provides service to Gary, Valparaiso, Plymouth, Warsaw, Fort Wayne, and Lima, features the shortest route alignment, and features the lowest existing freight volumes enabling greater operational flexibility.

2.2. Lima to Dunkirk to Kenton

The Lima to Dunkirk to Kenton corridor alignment is 51 miles in length and comprised of two ownership segments – Lima to Dunkirk, owned by the Chicago, Ft. Wayne & Eastern Railroad (CFER), and Dunkirk to Kenton, owned by CSX. The Lima to Dunkirk to Kenton corridor features a maximum freight train speed of 40-50 mph with 95% of the line featuring posted speeds of 40 or 50 mph. The average posted speed of the corridor is 43.2 mph.

The corridor's ROW width varies from 70 feet in more dense and physically constraining areas (Lima and Kenton) to 140 feet in less dense and open areas. Currently, the corridor features one mainline track with some passing and industrial sidings. The corridor connects the small towns of Lima, Dunkirk, and Kenton and traverses rural areas in-between.

There are 55 public at-grade crossings currently present on the corridor in addition to 24 private at-grade crossings. Three road bridges and three road underpasses or tunnels also intersect the rail corridor. An estimated five to nine freight trains operate each day on the corridor.

2.3. Lima to Kenton

The Lima to Kenton corridor alignment is 37 miles in length and is mostly abandoned ROW without track. The corridor connects the small towns of Lima and Kenton traversing rural areas in- between. Small segments near Lima and Kenton are active industrial tracks owned by the Indiana and Ohio Railroad and CSX, respectively.

According to the FRA's grade crossing database, the corridor features 13 public at-grade crossings and two private at-grade crossings. Two road bridges and one road underpass or tunnel also intersect the rail corridor.

Due to the abandonment of ROW, several pieces and segments of the ROW are no longer intact having been sold to individual buyers for various uses. Considering the existing condition of the corridor and local stakeholder input, this corridor is not a preferred alternative for the Lima to Kenton corridor segment.

2.4. Kenton to Marysville to Columbus

The Kenton to Marysville to Columbus corridor alignment is 70 miles in length and owned by CSX. The Kenton to Mt. Victory segment of the corridor is part of CSX's Toledo Subdivision featuring maximum freight train speeds of 50 mph. The Mt. Victory to Columbus segment of the corridor is part of CSX's Scottslawn Secondary Subdivision featuring maximum freight train speeds of 49 mph. Ninety-three percent (93%) of the Kenton to Marysville to Columbus corridor features maximum speeds of 49 or 50 mph.

The corridor's ROW width varies from 65 feet in more dense and physically constraining areas to 130 feet in less dense and open areas. Currently the corridor features one mainline track with some industrial sidings. The corridor connects the small towns of Kenton, Marysville, and suburban communities outside of Columbus traversing rural areas in between.

There are currently 58 public at-grade crossings present on the corridor in addition to 44 private at-grade crossings. Two road bridges and five road underpasses or tunnels also intersect the rail corridor. An estimated 12 to 19 freight trains operate each day on the corridor.

2.5. Columbus – North

The Columbus – North corridor alignment is eight miles in length and owned by Norfolk Southern. The line connects the Mounds and Hocking Interlockings on NS's Buckeye Branch which features maximum freight train speeds of 25 mph.

The corridor's ROW width varies from 45 feet in more dense and physically constraining areas to 95 feet in less dense and open areas. Currently the corridor features one mainline track and one passing siding in addition to other yard tracks part of NS's Grandview Yard. The corridor serves as a terminal area rail connection and provides access to an urban industrial corridor of Columbus.

Seven public at-grade crossings are currently present on the corridor in addition to four private at-grade crossings. Eight road bridges and two road underpasses or tunnels also intersect the rail corridor. An estimated seven freight trains operate each day on the corridor.

2.6. Columbus – South

The Columbus – South corridor alignment is 8.5 miles in length and comprised of two ownership segments – Mounds Interlocking to Camp Interlocking, owned by CSX, and CP-139 to CP-134, owned by Norfolk Southern. The Mounds Interlocking to Camp Interlocking segment of the corridor is part of CSX's Scottslawn Secondary Subdivision featuring a maximum freight speed of 30 mph for most of the line. The CP-139 to CP-138 segment of the corridor is part of Norfolk Southern's Buckeye Terminal featuring maximum freight speeds of 25 mph and 50 mph.

The corridor's ROW width varies from 30 feet in more dense and physically constraining areas to 110 feet in less dense and open areas. Currently the corridor features one mainline track. The corridor serves as a terminal area rail connection and provides access to an urban industrial corridor of Columbus.

Five public at-grade crossings are currently present on the corridor in addition to seven private at-grade crossings. Seven road bridges and seven road underpasses or tunnels also intersect the rail corridor. An estimated 12 to 20 freight trains operate each day on the corridor.

2.7. Columbus to Mingo Junction

The Columbus to Mingo Junction corridor alignment is 170 miles in length and comprised of two ownership segments – CP-138 to Weber Interlocking, owned by Norfolk Southern, and Weber Interlocking to Jewett, owned by the State of Ohio and operated by the Columbus & Ohio River Rail Road. The CP-138 to Weber Interlocking segment of the corridor is part of Norfolk Southern's Buckeye Terminal featuring maximum freight speeds of 40 mph and 50 mph. The Weber Interlocking to Newark segment of the corridor is part of Columbus & Ohio River Rail Road's Pan Subdivision featuring maximum freight speeds of 30 mph over much of the corridor with some permanent speed restriction areas of 10 to 20 mph. The Newark to Jewett segment of the corridor is part of the Columbus & Ohio River Rail Road's C&N Subdivision featuring maximum freight speeds of 30 mph with some permanent speed restriction areas of 10 to 25 mph.

The corridor's ROW width varies from 30 feet in more dense and physically constraining areas to 250 feet in less dense and open areas. Currently the corridor features one mainline track with some passing sidings. The corridor connects Columbus suburban communities to the small towns of Newark, Coshocton, Newcomerstown, Uhrichsville, and Jewett traversing rural areas in between.

118 public at-grade crossings are currently present on the corridor in addition to 75 private at-grade crossings. 41 road bridges and 14 road underpasses or tunnels also intersect the rail corridor. An estimated four to eight freight trains operate each day on the corridor.

2.8. Mingo Junction – Northern Alignment

The Mingo Junction – Northern Alignment corridor is 28 miles in length connecting Jewett and Mingo Junction. The corridor is owned by the State of Ohio and operated by the Columbus & Ohio River Rail Road as part of their Pan Subdivision. The corridor features maximum freight speeds of 30 mph with one permanent speed restriction of 10 mph for 0.7 miles.

The corridor's ROW width varies from 100 feet in more dense and physically constraining areas to 250 feet in less dense and open areas. Currently the corridor features one mainline track with one passing

siding. The corridor connects the small towns of Jewett and Mingo Junction traversing rural areas in between.

Ten public at-grade crossings are currently present on the corridor in addition to five private at-grade crossings. Seven road bridges and one road underpass or tunnel also intersect the rail corridor. An estimated five to eight freight trains operate each day on the corridor.

2.9. Mingo Junction – Southern Alignment

The Mingo Junction – Southern Alignment corridor includes 28 miles of the Wheeling & Lake Erie Rail Road between Jewett and Mingo Junction. The corridor is part of the Wheeling & Lake Erie's Rook Subdivision featuring maximum freight speeds of 40 mph.

The corridor's ROW width varies from 60 feet in more dense and physically constraining areas to 200 feet in less dense and open areas. Currently the corridor features one mainline track. The corridor connects the small towns of Jewett and Mingo Junction traversing rural areas in between.

Two public at-grade crossings are currently present on the corridor in addition to 11 private at-grade crossings. One road bridge and five road underpasses or tunnels also intersect the rail corridor. An estimated eight to 11 freight trains operate each day on the corridor.

2.10. Mingo Junction to Pittsburgh – North A

The Mingo Junction to Pittsburgh – North A corridor alignment is 89 miles in length and comprised of three ownership segments – Mingo Junction to Newell, owned by Norfolk Southern; Newell to Shippingport, abandoned ROW; and Shippingport to Pittsburgh, owned by CSX. The Mingo Junction to Newell segment of the corridor is part of Norfolk Southern's Weirton Secondary, however only the Mingo Junction to Weirton portion of the route is in active use. This maximum freight speeds of this segment are 10 to 25 mph. The Newell to Shippingport segment of the corridor is abandoned ROW with no track with many segments having been repurposed as local roads. The Shippingport to Pittsburgh segment of the corridor is part of CSX's Pittsburgh Subdivision featuring maximum freight speeds of 10 mph on the Ohio River Secondary Track from Shippingport to Blacks Run and 50 mph on Pittsburgh Subdivision mainline from Blacks Run to Pittsburgh.

The corridor's ROW width varies from 50 feet in more dense and physically constraining areas to 200 feet in less dense and open areas. Currently the corridor features one mainline track from Mingo Junction to Weirton, abandoned track from Weirton to Newell, abandoned ROW with no track from Newell to Shippingport, one secondary track from Shippingport to Blacks Run, two mainline tracks from Blacks Run to Aliquippa, one mainline track from Aliquippa to Coraopolis, and two mainline tracks from Coraopolis to Pittsburgh. In addition to the aforementioned small towns, the corridor traverses rural areas and connects to the Pittsburgh area.

There are currently 38 public at-grade crossings present on the corridor in addition to 34 private at-grade crossings. Twenty-seven road bridges and 16 road underpasses or tunnels also intersect the rail corridor. An estimated 7 to 75 freight trains operate each day on the active portions of the corridor with lower volumes seen between Mingo Junction to Weirton and Shippingport to Blacks Run and high volumes seen between Blacks Run and Pittsburgh.

2.11. Mingo Junction to Pittsburgh – North B

The Mingo Junction to Pittsburgh – North B corridor alignment is 90 miles in length and owned by Norfolk Southern. The entirety of the line is in Norfolk Southern's Pittsburgh Subdivision. The Mingo Junction to Yellow Creek segment of the corridor is part of Norfolk Southern's River Line featuring maximum freight speeds of 10 to 35 mph. The Yellow Creek to Rochester segment of the corridor is part of Norfolk Southern's Cleveland Line featuring maximum freight speeds of 35 to 40 mph on much of the line. The Rochester to Pittsburgh segment of the corridor is part of Norfolk Southern's Fort Wayne Line. This segment is the existing alignment of Amtrak's Washington-to-Chicago Capitol Limited service, specifically between the stations of Pittsburgh and Alliance, OH. Maximum passenger speeds are 50 to 79 mph.

The corridor's ROW width varies from 60 feet in more dense and physically constraining areas to 200 feet in less dense and open areas. Currently the corridor features one mainline track from Mingo Junction to Yellow Creek, two mainline tracks from Yellow Creek to Rochester, and three to four mainline tracks from Rochester to Pittsburgh. The corridor connects the small towns of Mingo Junction, Steubenville, East Liverpool, Rochester to the Pittsburgh area traversing rural areas in between.

There are currently 31 public at-grade crossings present on the corridor in addition to 28 private at-grade crossings. Twenty-one road bridges and 13 road underpasses or tunnels also intersect the rail corridor. An estimated 8 to 60 freight trains operate each day on the corridor in addition to two daily Amtrak trains. Lower train volumes are present on the western end of the corridor in Mingo Junction and Steubenville. Train volumes grow heading east towards Pittsburgh with the highest volumes seen on NS's Fort Wayne Line.

2.12. Mingo Junction to Pittsburgh – South

The Mingo Junction to Pittsburgh – South corridor alignment is 43 miles in length and owned by the Wheeling & Lake Erie Rail Road. The corridor is part of the Wheeling & Lake Erie's Rook Subdivision featuring maximum freight speeds of 30 mph over much of the line with some permanent speed restriction areas of 10 to 25 mph.

The corridor's ROW width varies from 60 feet in more dense and physically constraining areas to 200 feet in less dense and open areas. Currently the corridor features one mainline track from Mingo Junction to Pittsburgh. The corridor connects the small town of Mingo Junction to the Pittsburgh area traversing rural areas in between.

There are currently 15 public at-grade crossings present on the corridor in addition to six private at-grade crossings. Ten road bridges and 20 road underpasses or tunnels also intersect the rail corridor. An estimated two to four freight trains operate each day on the corridor.

2.13. Kirwan Heights to Dawn Station

The Kirwan Heights to Dawn Station corridor alignment is ten miles in length and owned by the Wheeling & Lake Erie Rail Road. The corridor is part of the Wheeling & Lake Erie's Rook Subdivision featuring maximum freight speeds of 10 to 25 mph.

The corridor's ROW width varies from 20 feet in more dense and physically constraining areas to 200 feet in less dense and open areas. Currently the corridor features one mainline track from Kirwan Heights to

Dawn Station. The corridor serves as a terminal area rail connection and provided access to a suburban and urban industrial corridor of Pittsburgh.

There are no public at-grade crossings on the corridor and five private at-grade crossings. Four road bridges and nine road underpasses or tunnels also intersect the rail corridor. An estimated two freight trains operate each day on the corridor.

2.14. Kirwan Heights to Ohio Connecting Bridge

The Kirwan Heights to Ohio Connecting Bridge corridor alignment is 12.5 miles in length and comprised of two ownership segments – Kirwan Heights to Dufts Junction, owned by the Pittsburgh and Ohio Central Railroad; and Dufts Junction to Ohio Connecting Bridge, owned by Norfolk Southern. The Kirwan Heights to Dufts Junction segment of the corridor features maximum freight speeds of 25 mph. The Dufts Junction to Ohio Connecting Bridge segment of the corridor is Norfolk Southern's Carnegie Industrial Track featuring maximum freight speeds of 10 mph.

The corridor's ROW width varies from 20 feet in more dense and physically constraining areas to 200 feet in less dense and open areas. Currently the corridor features one industrial track from Kirwan Heights to the Ohio Connecting Bridge. The corridor serves as a terminal area rail connection and provides access to a suburban and urban industrial corridor of Pittsburgh.

There are currently 13 public at-grade crossings present on the corridor in addition to three private at-grade crossings. Four road bridges and two road underpasses or tunnels also intersect the rail corridor. An estimated three to nine freight train operate each day on the corridor.

2.15. Pittsburgh – Ohio River West Lower

The Pittsburgh – Ohio River West Lower corridor alignment is 11 miles in length and owned by CSX. The corridor is part of CSX's Pittsburgh Subdivision featuring maximum freight speeds of 30 to 50 mph.

The corridor's ROW width varies from 35 feet in more dense and physically constraining areas to 120 feet in less dense and open areas. Currently the corridor features two mainline tracks. The corridor serves as a terminal area mainline rail connection and provides access to an urban industrial corridor of Pittsburgh.

There are current 14 public at-grade crossings present on the corridor in addition to three private at-grade crossings. Eight road bridges and one road underpass or tunnel also intersect the rail corridor. An estimated 20 to 52 freight trains operate each day on the corridor.

2.16. Pittsburgh – Ohio River West Upper

The Pittsburgh – Ohio River West Upper corridor alignment is 11 miles in length and owned by Norfolk Southern. The corridor is part of Norfolk Southern's Mon Line featuring maximum freight speeds of 20 to 40 mph.

The corridor's ROW width varies from 60 feet in more dense and physically constraining areas to 200 feet in less dense and open areas. Currently the corridor features two mainline tracks. The corridor serves as a terminal area mainline rail connection and provides access to an urban industrial corridor of Pittsburgh.

Fourteen public at-grade crossings are currently present on the corridor in addition to five private at-grade crossings. Thirteen road bridges and 18 road underpasses or tunnels also intersect the rail corridor. An estimated 18 to 22 freight trains operate each day on the corridor.

2.17. Pittsburgh – Downtown to Carnegie Mellon

The Pittsburgh – Downtown to Carnegie Mellon corridor alignment is eight miles in length and comprised of two ownership segments – Pittsburgh to Bloom Interlocking, owned by Norfolk Southern; and Bloom Interlocking to Carnegie Mellon, owned by CSX. The Pittsburgh to Bloom Interlocking segment of the corridor is part of Norfolk Southern's Pittsburgh Line. This segment features existing Amtrak rail service with maximum passenger speeds of 60 mph. The Bloom Interlocking to Carnegie Mellon segment of the corridor is part of CSX's P&W Subdivision featuring maximum freight speeds of 30 mph.

The corridor's ROW width varies from 35 feet in more dense and physically constraining areas to 150 feet in less dense and open areas. Currently the corridor features two mainline tracks from Pittsburgh to Bloom Interlocking and one mainline track from Bloom Interlocking to Carnegie Mellon. The corridor serves as a terminal area mainline rail connection and provides access to the urban core of Pittsburgh.

Two public at-grade crossings are currently present on the corridor in addition to two private at-grade crossings. Eleven road bridges intersect the corridor. No road underpasses or tunnels intersect the rail corridor. An estimated eight to 59 freight trains operate each day on the corridor in addition to four daily Amtrak trains on NS's Pittsburgh Line. CSX's P&W Subdivision features lower train volumes while NS's Pittsburgh line features the highest train volumes.

2.18. Pittsburgh – Downtown

The Pittsburgh – Downtown corridor alignment is eight miles in length and owned by Norfolk Southern. The Bell Interlocking to West Pitt segment of the corridor is part of Norfolk Southern's Fort Wayne Line. The West Pitt to Pittsburgh Union Station segment of the corridor is part of Norfolk Southern's Pittsburgh Line. Both segments feature existing Amtrak rail service with maximum passenger speeds of 20 to 50 mph.

The corridor's ROW width varies from 60 feet in more dense and physically constraining areas to 200 feet in less dense and open areas. Currently the corridor features four mainline tracks from Bell Interlocking to West Pitt and two mainline tracks from West Pitt to Pittsburgh Union Station. The corridor serves as a terminal area mainline rail connection and provides access to urban core of Pittsburgh.

Five public at-grade crossings are currently present on the corridor in addition to five private at-grade crossings. Twelve road bridges and 11 road underpasses or tunnels intersect the rail corridor. An estimated 59 freight trains operate each day on the corridor in addition to four daily Amtrak trains.

3.0 Screening Criteria

3.1. Route Screening Criteria

The following factors were considered when identifying potential route alignments for future service:

1. Track Class/Speed – Are existing track conditions operating speeds on the corridor conducive for intercity passenger rail?
2. Train Volumes – What are the existing freight and passenger train volumes and is there potential to accommodate new/additional intercity passenger rail service?
3. Track Capacity – Is there adequate track capacity for future intercity passenger rail service?
4. Route Circuity – How circuitous is the route and is it capable of providing direct, higher-speed passenger service?
5. Corridor Communities and Land Use – What communities are located along the route and are the land uses supportive of intercity passenger rail?
6. Ownership – Is the ROW owner amenable to hosting future intercity passenger rail service?
7. Number of At-Grade Crossings – How many at-grade crossings would require upgrades or closure?
8. Number of Bridge, Underpass, or Tunnel Structures – How many structures may require modifications or replacement for corridor improvements or modifications?
9. ROW Width – Is adequate ROW available for potential track capacity improvements?
10. Signaling – What signaling modifications are required?

Track Class/Speed

The existing track classification is indicative of existing track speeds and vice versa. Track speeds are a significant determinant of intercity passenger rail travel times, the travel time-competitiveness of the service compared to other modes, and ultimately the attractiveness of the service. The higher the track class and track speed, the more amenable the corridor is for intercity passenger rail service.

Train Volumes

Existing train volumes may preclude or accommodate future intercity passenger rail services depending on track capacity and type of train movements. Generally, lesser train volumes present greater opportunities for future intercity passenger rail.

Track Capacity

The existing track configuration and capacity is a significant infrastructure consideration to determine what modifications are necessary to accommodate future intercity passenger rail service. The consideration of both track capacity and existing train volumes are significant factors in determining future track infrastructure improvements/modifications.

Route Circuity

The circuity of a route or its directness is an indicator of the length of a corridor, permissible track speeds, and the geography through which a route travels. Thus, route circuity is expressive of expected travel times and the geographies/communities the line serves.

Corridor Communities and Land Use

Communities that are served on a corridor and their adjacent land use can influence the ridership demand and potential of the route. Local community preferences are also a factor in determining route alignments as described in Section 3.2 below.

Ownership

The owner of rail ROW determines the entity that must be negotiated with for future intercity passenger rail service. Some owners may be more amenable or opposed to intercity passenger rail service on their respective corridor than others depending on a variety of factors such as existing train volumes, future forecasted volumes, track capacity, track conditions, etc. Additionally, the number of ROW owners can present challenges in successfully negotiating future intercity passenger rail service as each additional owner can add a single point of failure threat.

Number of At-Grade Crossings

At-grade crossings pose safety concerns and limitations to maximum operating speeds per FRA regulations. Depending upon the desired operating speeds and frequency of service, modifications and closures of at-grade crossings will likely be necessary for FRA regulation compliance. At-grade crossing modifications are a significant capital cost when implementing new intercity passenger rail service.

Number of Bridge, Underpass, or Tunnel Structures

Intercity passenger rail service may introduce the need for increased track capacity and lateral ROW. Track capacity expansion can prove challenging and costly at locations where bridges, underpasses, or tunnels are present on a route.

ROW Width

The introduction of intercity passenger rail service may require additional lateral ROW to construct additional mainline tracks or passing sidings to increase track capacity. The presence of additional ROW adjacent to existing track presents a greater opportunity for future track capacity expansion.

Signaling

The FRA defines specific signaling technology on corridors that feature intercity passenger rail services depending on the frequency and speed of service. The existing signaling system is an indicator of what modifications or improvements may be necessary to accommodate future intercity passenger rail service.

3.2. Station Screening Criteria

The following factors were considered when identifying potential locations for future stations:

1. Local Preference – Did a local official or stakeholder identify a preferred location?
2. Former Station Location – Does a former station location exist?
3. Tangent Track – Is there sufficient tangent track for a boarding platform?
4. Adjacent Land Use – Is there space for a station building, platforms, and sufficient parking within the neighborhood context?
5. Distance Between Stations – Is the distance between adjacent stations ideal for intercity passenger service?
6. Population Center and/or Access to Connecting Infrastructure – Is the station located within a reasonably-sized population center or is it near connecting infrastructure, such as a highway or a large parking area?
7. Overall Travel Time – From an overall route perspective, do the number of stations interfere with travel time goals, through additional time from accelerating, decelerating, and dwelling?

Local Preference

Local preference is a primary consideration when selecting a potential station location. The local stakeholders understand the opportunities and constraints within their own communities. Local officials and stakeholders know if a particular location is likely to be viable politically or if it fits into a local economic or transportation plan.

Former Station Location

If a historic station site exists, that could be an ideal location because at least some of the infrastructure may be suitable for use and the community may support reactivating that location.

Tangent Track

For high platform boarding, ADA requirements permit a platform on a curve no greater than one degree, forty minutes, i.e., relatively straight track. The ADA also requires level boarding for all cars on the train. A six-car train would typically require a platform that is a minimum of 500 feet long. There are ADA exemptions for freight routes, and while the rules are less stringent, there are still equivalent facilitation requirements for ADA.

Adjacent Land Use

If the site is small or abuts certain land uses, it may be difficult to build an effective station. For example, there might not sufficient space to build a parking lot or the property could be near an industrial site which might restrict development.

Distance Between Stations

If stations are too close together, they can cannibalize each other's markets. This can increase expenses because as a result, multiple underutilized stations are built and maintained. Determining the appropriate distance between stations is dependent on local market, geography, and infrastructure conditions.

Population Center and/or Access to Connecting Infrastructure

Stations do well when they are in a good-sized population center or in a location with significant attraction, such as a university. Intercept stations may be outside populations centers, but are close to connecting transportation infrastructure (e.g., a highway) and have ample parking.

Overall Travel Time

The desired travel time goal for a corridor also determines how many stations there are. Each additional station means the train is spending more time accelerating, decelerating, and dwelling, which adds travel time to the full journey.

4.0 Initial Screening/Evaluation of Route Alternatives

4.1. Route Alternatives Screening

The various route segment alternatives described in Section 2 present several opportunities and challenges for future intercity passenger rail services. In addition to the route characteristics and conditions described in Section 2, this section presents important route attributes for consideration in the selection of a preferred corridor alignment.

Based on route segment characteristics, each route segment features attributes that support the implementation of future intercity passenger rail service and attributes that challenge the implementation of future intercity passenger rail service. The below discussion details the opportunities and constraints of each route segment according to the existing conditions and physical attributes gathered and presented in Appendix A. Any known infrastructure improvements that would be required to utilize a particular segment are listed. Subsequent technical analysis will be required to determine the full list of infrastructure needs for each segment.

Lima to Dunkirk to Kenton

Opportunities

The Lima to Dunkirk to Kenton route segment features the only active rail corridor between the segment endpoints of Lima to Kenton. Existing posted freight speeds are moderate and could likely sustain passenger rail speeds of 50 to 65 mph over much of the corridor. Low freight volumes on the corridor are likely accommodating of additional train movements and potential intercity passenger rail service.

Constraints

The Lima to Dunkirk to Kenton route segment is constrained by a single mainline track and limited passing sidings. The presence of several low-speed track segments featuring freight speeds of 25-35 mph pose operational constraints for future intercity passenger rail service. A significant number of at-grade crossings are present on the corridor which likely require significant modification costs or closure. The presence of the Chicago, Fort Wayne and Eastern Railroad train operating company (TOC) on the Lima to Dunkirk segment of the corridor creates additional challenges in negotiating future passenger rail services.

Potential Infrastructure Improvements

- Increase track capacity
- Upgrade track classification
- Eliminate selected at-grade crossing facilities
- Improve remaining at-grade crossing facilities

Significant Infrastructure Improvements Required

- Track connection at Dunkirk

Lima to Kenton

Opportunities

The Lima to Kenton route segment is the most direct rail corridor between the segment endpoints of Lima to Kenton.

Constraints

The Lima to Kenton route segment is an inactive rail corridor. All track infrastructure would likely require a complete replacement and rebuild. Reacquisition of corridor ROW that has been sold to individual buyers would also be required.

Potential Infrastructure Improvements

- Reacquire corridor ROW
- Rebuild track infrastructure to intercity passenger rail standards
- Eliminate at-grade crossing facilities
- Improve remaining at-grade crossing facilities

Based on input from local stakeholders and the likely acquisition of significant amounts of rail right-of-way, this Lima to Kenton segment was removed from further consideration.

Kenton to Marysville to Columbus

Opportunities

Posted freight speeds on the Kenton to Marysville to Columbus route segment are moderate and could likely sustain passenger rail speeds of up to 65 mph over much of the corridor.

Constraints

The Kenton to Marysville to Columbus route segment is constrained by a single mainline track. Relative to the single-track configuration, the corridor features moderate freight train volumes that could constrain the possibility of future passenger service in this current configuration. The presence of a low-speed track segment with freight speeds of 20 mph may pose operational constraints for future passenger rail service.

Potential Infrastructure Improvements

- Increase track capacity
- Upgrade track classification
- Eliminate several at-grade crossing facilities
- Improve remaining at-grade crossing facilities

Significant Infrastructure Improvements Required

None identified at this level of analysis.

Columbus – North

Opportunities

The Columbus – North route segment alternative features lower freight train volumes than the Columbus – South route segment alternative. The corridor features a single owner and operator, a potential benefit

in negotiating future passenger rail service operations. The corridor features one passing siding (compared to no passing sidings on the Columbus – South route segment alternative).

Constraints

The Columbus – North route segment alternative features slower posted speeds than the alternative Columbus – South route segment alternative. Terminal area freight and switching operations likely complicate future passenger rail service.

Potential Infrastructure Improvements

- Increase track capacity
- Upgrade track classification
- Eliminate selected at-grade crossing facilities
- Improve remaining at-grade crossing facilities

Significant Infrastructure Improvements Required

- New track connection to Kenton to Marysville to Columbus route segment (connecting CSX's Scottslawn Secondary to Norfolk Southern's Buckeye Branch)

Columbus – South

Opportunities

The Columbus – South route segment alternative features higher posted speeds than the alternative Columbus – North route segment alternative.

Constraints

The Columbus – South route segment alternative features two owners and operators, a potential challenge in negotiating future passenger rail service operations (compared to a single owner and operator for the Columbus – North route segment alternative). The corridor's single mainline track poses operational constraints for future passenger rail service. Corridor freight train volumes are higher than the Columbus – North route segment alternative. Terminal area freight and switching operations are also likely to complicate future passenger rail service.

Potential Infrastructure Improvements

- Increase track capacity
- Upgrade track classification
- Eliminate selected at-grade crossing facilities
- Improve remaining at-grade crossing facilities

Significant Infrastructure Improvements Required

None identified at this level of analysis.

Columbus to Mingo Junction

Opportunities

The majority of the Columbus to Mingo Junction route segment is owned by the State of Ohio which would likely facilitate negotiations for future passenger rail service. The route segment features low freight train volumes.

Constraints

The Columbus to Mingo Junction route segment features slow operating speeds, constraining passenger speeds to a maximum of 45 mph. Several permanent speed restrictions of 10 to 25 mph (freight) pose further operational constraints for future passenger rail service. The corridor's single mainline track poses operational constraints for future passenger rail service.

Potential Infrastructure Improvements

- Increase track capacity
- Upgrade track classification
- Eliminate selected at-grade crossing facilities
- Improve remaining at-grade crossing facilities

Significant Infrastructure Improvements Required

None identified at this level of analysis.

Mingo Junction – Northern Alignment

Opportunities

The Mingo Junction – Northern Alignment route segment alternative is owned by the State of Ohio which would likely facilitate negotiations for future passenger rail service. The route segment features lower freight train volumes than the Mingo Junction – Southern Alignment.

Constraints

The Mingo Junction – Northern Alignment route segment alternative features slower operating speeds (compared to the Mingo Junction – Southern Alignment), constraining passenger speeds to a maximum of 45 mph. A permanent speed restriction of 10 mph (freight) poses further operational constraints for future passenger rail service. The corridor's single mainline track poses operational constraints for future passenger rail service.

Potential Infrastructure Improvements

- Increase track capacity
- Upgrade track classification
- Eliminate selected at-grade crossing facilities
- Improve remaining at-grade crossing facilities

Significant Infrastructure Improvements Required

None identified at this level of analysis.

Mingo Junction – Southern Alignment

Opportunities

The Mingo Junction – Southern Alignment route segment alternative features higher operating speeds (compared to the Mingo Junction – Northern Alignment), accommodating passenger speeds of up to 55 mph.

Constraints

The Mingo Junction – Southern Alignment route segment alternative features higher freight train volumes than the Mingo Junction – Northern Alignment. The corridor is owned by a private entity, the Wheeling & Lake Erie Rail Road, as opposed to the state-owned Mingo Junction – North Alignment. The corridor's single mainline track poses operational constraints for future passenger rail service.

Potential Infrastructure Improvements

- Increase track capacity
- Upgrade track classification
- Eliminate selected at-grade crossing facilities
- Improve remaining at-grade crossing facilities

Significant Infrastructure Improvements Required

None identified at this level of analysis.

Mingo Junction to Pittsburgh – North A

Opportunities

The majority of the Mingo Junction to Pittsburgh – North A route segment alternative features low freight train volumes (from Mingo Junction to Blacks Run), accommodating of future passenger rail service.

Constraints

The Mingo Junction to Pittsburgh – North A route segment alternative is partially abandoned, requiring significant capital improvements to rebuild the rail corridor. The reacquisition of corridor ROW may also be required. On the eastern end of the corridor, very high freight volumes pose a challenge in establishing future passenger rail service. The active portions of the corridor feature low speeds, likely constraining passenger service to a maximum of 20 – 40 mph over much of the corridor. The corridor alignment (89 miles) is circuitous compared to the Mingo Junction to Pittsburgh – South route segment alternative (43 miles). Multiple ROW owners likely complicate negotiations for future passenger rail service.

Potential Infrastructure Improvements

- Reacquire corridor ROW (if needed)
- Rebuild track infrastructure (where needed) to intercity passenger rail standards
- Eliminate at-grade crossing facilities
- Improve remaining at-grade crossing facilities
- Increase track capacity on the Pittsburgh Subdivision Mainline
- Upgrade track classification
- Eliminate selected at-grade crossing facilities
- Improve remaining at-grade crossing facilities

Significant Infrastructure Improvements Required

None identified at this level of analysis.

Mingo Junction to Pittsburgh – North B

Opportunities

The Mingo Junction to Pittsburgh – North B route segment alternative features higher operating speeds than the Mingo Junction to Pittsburgh – North A route segment alternative, accommodating passenger

speeds of up to 50-79 mph over much of the route. The Rochester to Pittsburgh portion of the corridor already features Amtrak passenger rail service, likely a benefit in negotiating future passenger rail service. The corridor's single owner and operator is also a potential benefit in negotiating future passenger rail service.

Constraints

The Mingo Junction to Pittsburgh – North B route segment alternative features very high train volumes over much of the corridor, posing a challenge for future passenger rail service operations. The corridor's 90 route miles is circuitous compared to the Mingo Junction to Pittsburgh – South route segment alternative alignment of 43 miles.

Potential Infrastructure Improvements

- Increase track capacity on the Cleveland Line and Fort Wayne Line
- Upgrade track classification
- Eliminate selected at-grade crossing facilities
- Improve remaining at-grade crossing facilities

Significant Infrastructure Improvements Required

None identified at this level of analysis.

Mingo Junction to Pittsburgh – South

Opportunities

The Mingo Junction to Pittsburgh – South route segment alternative features the shortest route distance from Mingo Junction to Pittsburgh compared to the other route segment alternatives. The corridor features low freight volumes accommodating of future passenger rail service.

Constraints

The Mingo Junction to Pittsburgh – South route segment alternative features low operating speeds, likely constraining passenger operations to a maximum of 45 mph with some slower speed restriction areas. The corridor's single mainline track poses operational constraints for future passenger rail service.

Potential Infrastructure Improvements

- Increase track capacity
- Upgrade track classification
- Eliminate selected at-grade crossing facilities
- Improve remaining at-grade crossing facilities

Significant Infrastructure Improvements Required

None identified at this level of analysis.

Kirwan Heights to Dawn Station

Opportunities

The Kirwan Heights to Dawn Station route segment alternative offers the shortest and quickest alignment to a Pittsburgh-area station from the Mingo Junction to Pittsburgh – South corridor approach. The corridor features low freight volumes accommodating of future passenger rail service. The corridor is devoid of public at-grade crossings, minimizing associated capital costs in upgrading safety devices.

Constraints

The Kirwan Heights to Dawn Station route segment alternative does not serve downtown Pittsburgh. The corridor features low operating speeds, likely constraining passenger operations to a maximum of 40 mph. The corridor's single mainline track poses operational constraints for future passenger rail service. Narrow ROW of approximately 20 feet at certain locations may constrain track improvement projects to increase corridor capacity.

Potential Infrastructure Improvements

- Increase track capacity
- Upgrade track classification

Significant Infrastructure Improvements Required

None identified at this level of analysis.

Kirwan Heights to Ohio Connecting Bridge

Opportunities

The Kirwan Heights to Ohio Connecting Bridge route segment alternative provides a connection to Pittsburgh's downtown area for the Mingo Junction to Pittsburgh – South corridor approach. The corridor features low freight volumes that are likely more accommodating of future passenger rail service.

Constraints

The Kirwan Heights to Ohio Connecting Bridge route segment alternative features low operating speeds, likely constraining passenger operations to a maximum of 40 mph or lower over the entire route. The corridor alignment is circuitous, increasing the travel time to Pittsburgh's downtown area.

Potential Infrastructure Improvements

- Increase track capacity
- Upgrade track classification
- Eliminate selected at-grade crossing facilities
- Improve remaining at-grade crossing facilities

Significant Infrastructure Improvements Required

- New rail connection to Mingo Junction to Pittsburgh – South route segment alternative (connecting the Wheeling & Lake Erie Rail Road's Rook Subdivision to the Pittsburgh and Ohio Central Railroad)

Pittsburgh – Ohio River West Lower

Opportunities

The Pittsburgh – Ohio River West Lower route segment alternative features two mainline tracks and serves Pittsburgh's growing South Side Flats neighborhood adjacent to downtown Pittsburgh. Corridor operating speeds are moderate to high, likely accommodating passenger speeds of up to 65 mph.

Constraints

The Pittsburgh – Ohio River West Lower route segment alternative features high freight train volumes and serves as a terminal area mainline rail connection posing operational challenges for future passenger rail service.

Potential Infrastructure Improvements

- Increase track capacity
- Upgrade track classification
- Eliminate selected at-grade crossing facilities
- Improve remaining at-grade crossing facilities

Significant Infrastructure Improvements Required

None identified at this level of analysis.

Pittsburgh – Ohio River West Upper

Opportunities

The Pittsburgh – Ohio River West Upper route segment alternative features two mainline tracks and serves Pittsburgh's growing South Side Flats neighborhood adjacent to downtown Pittsburgh. The corridor features lower freight volumes than the Pittsburgh – Ohio River West Lower route segment alternative, likely more accommodating of future passenger rail service.

Constraints

The Pittsburgh – Ohio River West Upper route segment alternative serves as a terminal area mainline rail connection posing operational challenges for future passenger rail service. Corridor operating speeds are lower than the Pittsburgh – Ohio River West Lower route segment alternative, likely accommodating passenger speeds of 35 to 55 mph.

Potential Infrastructure Improvements

- Increase track capacity
- Upgrade track classification
- Eliminate selected at-grade crossing facilities
- Improve remaining at-grade crossing facilities

Significant Infrastructure Improvements Required

None identified at this level of analysis.

Pittsburgh – Downtown to Carnegie Mellon

Opportunities

The Pittsburgh – Downtown to Carnegie Mellon route segment alternative serves as an alternate gateway to Downtown Pittsburgh and Pittsburgh Union Station and could also serve the growing Oakland and Squirrel Hill neighborhoods of Pittsburgh.

Constraints

The Pittsburgh – Downtown to Carnegie Mellon route segment alternative serves as a terminal area rail connection posing operational challenges for future passenger rail service. Corridor operating speeds are low, likely accommodating passenger speeds of 20 to 45 mph over much of the route. New rail infrastructure is required to connect CSX's W&P Subdivision Monongahela River Bridge to the Pittsburgh – Ohio River West Upper or Pittsburgh – Ohio River West Lower route segment alternatives which lie below the existing bridge structure parallel to the Monongahela River.

Potential Infrastructure Improvements

- Increase track capacity
- Upgrade track classification
- Eliminate selected at-grade crossing facilities
- Improve remaining at-grade crossing facilities

Significant Infrastructure Improvements Required

- New rail connection to Pittsburgh – Ohio River West Upper or Pittsburgh – Ohio River West Lower route segment alternatives (connecting the river adjacent lines to the elevated bridge/line across the Monongahela River)

Pittsburgh – Downtown

Opportunities

The Pittsburgh – Downtown route segment alternative provides direct access to Pittsburgh's Union Station and features existing Amtrak passenger rail service.

Constraints

The Pittsburgh – Downtown route segment alternative features very high freight volumes, posing a challenge for future passenger rail service operations.

Potential Infrastructure Improvements

- Increase track capacity
- Upgrade track classification
- Eliminate selected at-grade crossing facilities
- Improve remaining at-grade crossing facilities

Significant Infrastructure Improvements Required

None identified at this level of analysis.

4.2. Station Alternatives Screening

Certain cities along the possible passenger rail corridor were identified as potential station locations (Table 2). More specific details on where stations might be located within the cities is examined later in this report.

Table 2. Potential Station Cities, Population, and Distance

	City	Population (U.S. Census 2017 Estimates)	Route Miles Between Stations
1	Lima, OH	37,149	--
2	Kenton, OH	8,135	34.6
3	Marysville, OH	23,912	32.2
4a	Dublin, OH	47,619	11.9*
4b	Hilliard, OH	35,939	18.1*
5	Columbus, OH	879,170	9.1
6	Newark, OH	49,423	33
7	Coshocton, OH	11,044	35.5
8a	Newcomerstown, OH	<5,000	16.5**
8b	Uhrichsville, OH	5,351	31.8**
9a	Mingo Junction, OH	<5,000	49.2***
9b	Steubenville, OH	18,003	
10	Pittsburgh, PA	302,407	--[1]

*Distance from Marysville, OH
**Distance from Coshocton, OH
***Distance from Uhrichsville, OH

Preliminary stakeholder outreach efforts to date have garnered interest from municipalities and officials on the western portion of the corridor west of Columbus. As a result, the station alternatives screening and discussion in this report are focused on the station locations in Lima, Columbus and intermediate points. Future stakeholder outreach will be necessary to identify and screen station site alternatives for the eastern portion of the corridor (all points east of Columbus).

Thirteen cities were identified as potential station cities for a possible passenger rail route from Lima to Columbus to Pittsburgh. In some cases, alternative cities are identified, where a station might be appropriate in either city A or city B. For example, a station might be appropriate Newcomerstown or Uhrichsville, and in Mingo Junction or Steubenville. The average population among the identified cities is 138,000.[2] Excluding Columbus and Pittsburgh, the average population is 25,000. The average distance between cities is 30.1 route miles. [3]

For comparison, another Midwest intercity passenger rail service is Amtrak's Lincoln service, running between Chicago and St. Louis (see Table 3). The average station city population along the route is

[1] The Route Alternatives Analysis identified several different ROW alignments from Mingo Junctions/Steubenville to Pittsburgh which vary in distances. Thus, route miles from Mingo Junction to Pittsburgh was not calculated, since a preferred alignment was not identified.
[2] The average population was calculated using the higher population city for the three alternative pairs. Thus the population average represents Lima, Kenton, Marysville, Dublin, Columbus, Newark, Coshocton, Uhrichsville, Steubenville, and Pittsburgh.
[3] The average distance was calculated using the higher population city for the three alternative pairs. The average represents average route miles for Kenton, Marysville, Dublin, Columbus, Newark, Coshocton, Uhrichsville, and Steubenville.

316,000. When excluding Chicago and St. Louis, the average population is 50,000. The average distance between stations is 28.4 route miles. The Amtrak River Runner provides service between St. Louis and Kansas City (see Table 4). The average station city population along the routes is 130,000. When excluding St. Louis and Kansas City, the average population is 43,000. The average distance between stations is 31.4 route miles.

When examining these other two Midwestern intercity passenger rail lines, the Lima-Columbus-Pittsburgh route serves less populous cities and at a closer distance to each other.

Table 3. Amtrak Lincoln Service Station Cities, Population, and Distance

	City	Population (U.S. Census 2017 Estimates)	Route Miles Between Stations
1	Chicago	2,716,450	--
2	Summit, IL	11,278	12
3	Joliet, IL	148,462	25
4	Dwight, IL	<5,000	37
5	Pontiac, IL	11,809	18
6	Bloomington-Normal, IL	132,218	32
7	Lincoln, IL	13,816	32
8	Springfield, IL	114,868	29
9	Carlinville, IL	5,550	39
10	Alton, IL	<5,000	33
11	St. Louis, MO	308,626	27

Table 4. Amtrak Missouri River Runner Service Station Cities, Population, and Distance

	City	Population (U.S. Census 2017 Estimates)	Route Miles Between Stations
1	St. Louis, MO	308,626	--
2	Kirkwood, MO	27,653	13
3	Washington, MO	13,966	38
4	Hermann, MO	<5,000	30
5	Jefferson City, MO	42,895	44
6	Sedalia, MO	21,568	64
7	Warrensburg, MO	20,168	29
8	Lee's Summit, MO	97,290	42
9	Independence, MO	117,306	13
10	Kansas City, MO-KS	641,881	10

5.0 Findings/Results of Initial Screening

5.1. Potential Route Alternatives

Much of the corridor features a preferred alignment that has been identified according to previously discussed attributes such as track condition, train volumes, and ownership. However, as discussed in Section 4, four segments of the corridor feature one or more route alternatives that each present various opportunities and challenges. A comparison of the most critical factors which include attributes such as ownership, length, speeds, and train volumes are represented in Table 5 below. A detailed table comparing corridor rail segments is in Appendix A.

Additionally, corridor train volumes for all route alternatives are represented in Figure 3 below.

Table 5: Alternative Corridor Alignments and Attributes

Rail Segment	Ownership	Length (miles)	Avg Speed	Imputed Track Class	Number and Trains per Day	Number of Public At-Grade Crossings	Number of Private At-Grade Crossings
Lima - Dunkirk - Kenton	CFER & CSX	36	43.2	3.4% - Class 2 1.6% - Class 2/3 57.1% - Class 3 37.9% - Class 3/4	5 to 9	55	24
Kenton - Marysville - Columbus	CSX	65.1	47.1	5.8% - Class 2 2.5% - Class 3 91.4% - Class 3/4	12 to 19	58	44
Columbus - North	NS	6	25	100% - Class 2	7	7	4
Columbus - South	CSX & NS	6.7	35.3	16.7% - Class 2 81.7% - Class 2 13.3% - Class3/4	12 to 20	5	7
Columbus - Mingo Junction	State of Ohio	124	29.8	2% - Class 2 3.2% - Class 2 92.8% - Class 2 1.9% - Class 3 0.1% - Class 3/4	4 to 8	118	75
Mingo Junction - Northern Alignment	State of Ohio	20.5	29.3	3.4% - Class 1 96.6% - Class 2	5 to 8	10	5
Mingo Junction - Southern Alignment	WE	23.5	40	100% - Class 3	8 to 11	2	11
Mingo Junction to Pittsburgh - North A	CSX, NS, & PVTX	64.7	18.6	43.3% - Abandoned 20.3% - Class 1 6.5% - Class 2 30% - Class 3/4	7 to 75	38	34
Mingo Junction to Pittsburgh - North B	NS	66.7	46.6	7.7% - Class 1 27.4% - Class 2/3 32.8% - Class 3 2.3% - Class 3/4 1.35% - Class 4 1.05% - Class 3 13.19% - Class 4 14.24% - Class 4	8 to 60	31	28

Rail Segment	Ownership	Length (miles)	Avg Speed	Imputed Track Class	Number and Trains per Day	Number of Public At-Grade Crossings	Number of Private At-Grade Crossings
Mingo Junction to Pittsburgh - South	WE	35.1	29.1	0.9% - Class 1 14.5% - Class 2 84.6% - Class 2	4 to 8	15	6
Kirwan Heights to Dawn Station	WE	8.4	18.8	41.7% - Class 1 58.3% - Class 2	2	0	5
Kirwan Heights to Ohio Connecting Bridge	PIR, POHC	9.8	22.2	18.4% - Class 1 81.63% - Class 2	3 to 9	13	3
Pittsburgh - Ohio River West - Lower	CSX	5.4	43.3	33.3% - Class 2 66.7% - Class 3/4	20 to 52	13	3
Pittsburgh - Ohio River West - Upper	NS	9.5	28.7	30.5% - Class 2 34.7% - Class 2 34.7% - Class 3	18 to 22	14	5
Pittsburgh - Downtown to Carnegie Mellon	CSX	3.1	38.7	71% - Class 2 29% - Class 4	8 to 59	2	2
Pittsburgh - Downtown	NS	5.6	39.6	5.4% - Class 2 10.7% - Class 2 30.4% - Class 2 53.6% - Class 3/4	18 to 59	5	5

Figure 3: Alternative Rail Segments and Train Volumes



5.2. Potential Station Locations

Lima Station Location

The City of Lima has preserved their historic passenger rail station by occupying it with other uses. The Utilities Department currently uses the station. The station is located in central Lima and has approximately 600 feet of tangent track adjacent to it.[4]

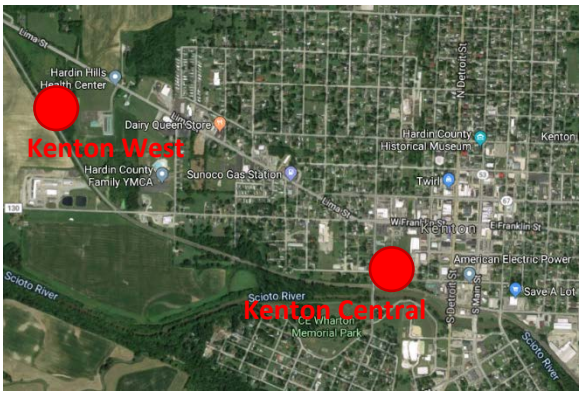


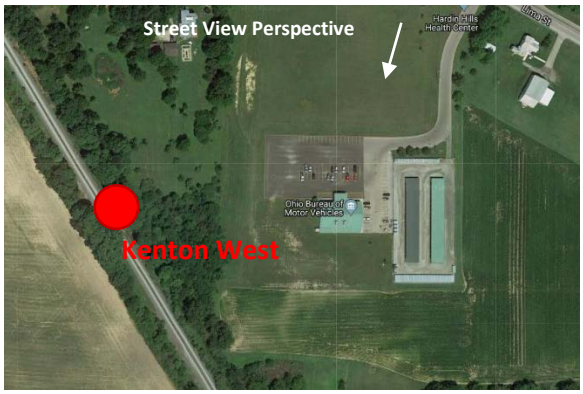


Kenton Station Locations

Two potential station locations were identified in Kenton: a west location and a central location.

The west location has over 1,000 feet of tangent track and is immediately west of an Ohio Bureau of Motor Vehicles (BMV) facility. An access road to the station would need to be built, but perhaps the BMV driveway could be shared. There may also be potential to share parking with the BMV.

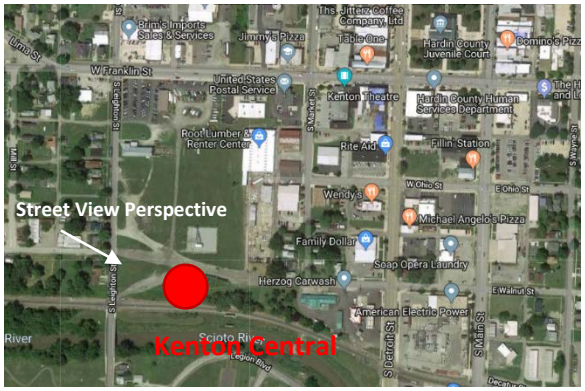






[4] Lima Station Photo from Wikipedia: https://en.wikipedia.org/wiki/Lima_station_(Pennsylvania_Railroad)#/media/File:Lima_Pennsylvania_Railroad_Passenger_Depot_front.jpg

The central location is in downtown Kenton. There is close to 500 feet of tangent track, although a small segment of the track may need to be straightened. There is adequate space for a facility and parking, however the property may need to be acquired from a private owner. City officials have expressed congestion concerns related to stationary trains blocking adjacent grade crossings and the prevalence of recent flooding events that could compromise the site.





Marysville Station Locations

Two potential station locations were identified in Marysville: a west location and a south location.

The west location has close to 500 feet of tangent track, but may require some curve straightening. There appears to be sufficient space for a station and it is adjacent to an underutilized parking lot. The property may need to be acquired from a private owner. This site is located in a potentially walkable section of Marysville and may be appropriate for transit-oriented development.







The Marysville South location has over 1,000 feet of tangent track. The property appears to currently be used for agricultural purposes and may need to be acquired from a private owner. The site has sufficient space for a station, platforms, and parking. It is adjacent to a Walmart Supercenter.



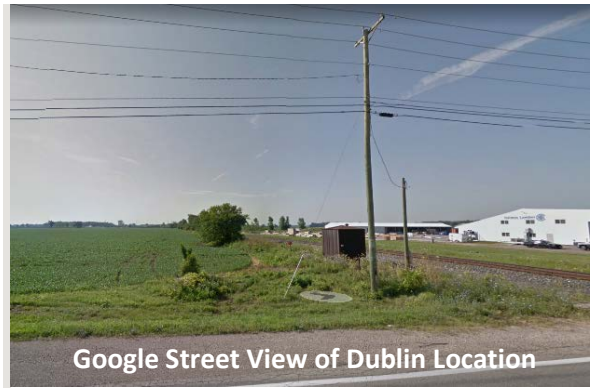


Dublin Station Location

Either a station in Dublin or in Hilliard would be appropriate. A potential location was identified in Dublin.

The site is currently agricultural land and would likely need to be acquired from a private owner. There is over 1,000 feet of tangent track as well as sufficient space for a station, platforms, and parking. The location has relatively easy access to Route 33 and I-270. It is also relatively near to OhioHealth Dublin and to Northwest Columbus destinations.

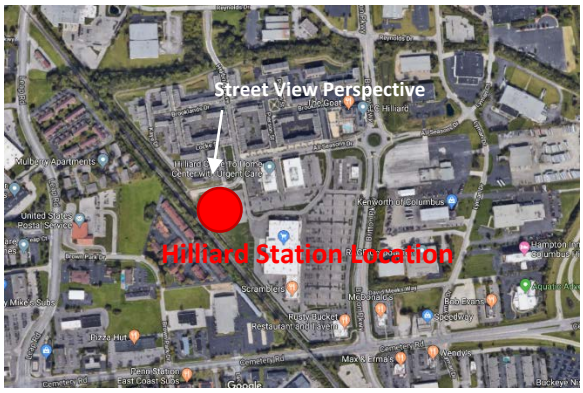




Hilliard Station Location

Either a station in Dublin or in Hilliard would be appropriate. A potential location was identified in Hilliard.

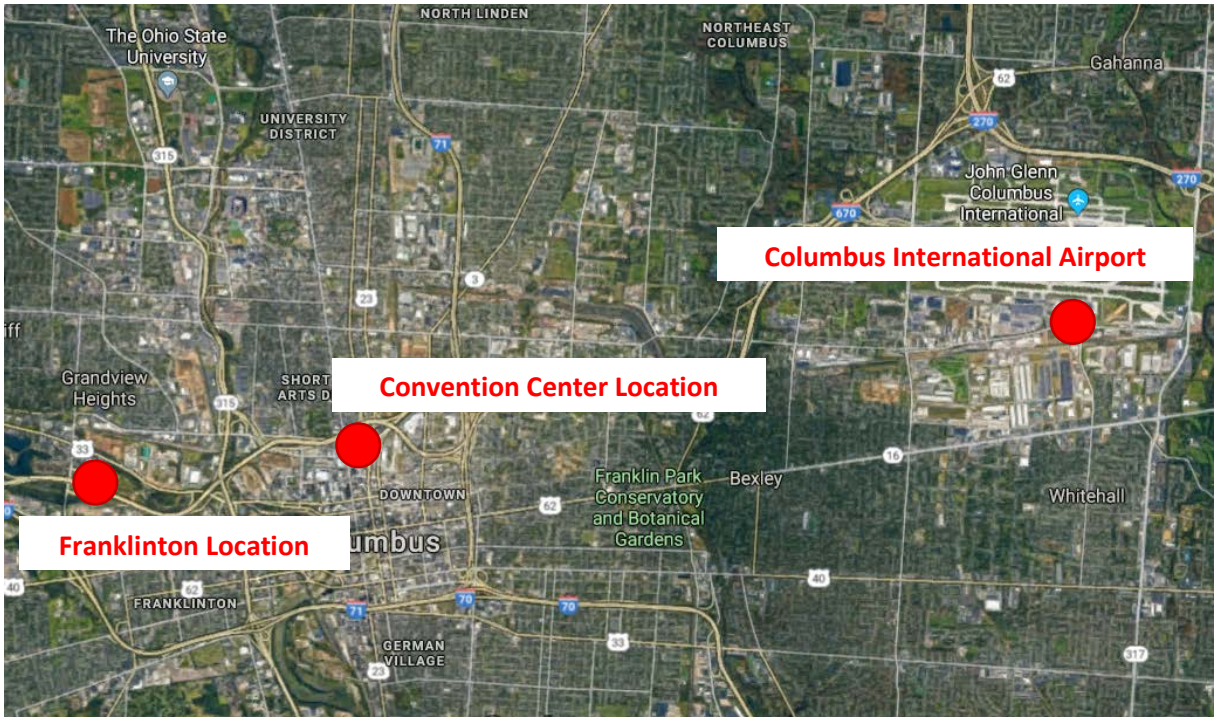
The site identified in Hilliard has over 1,000 feet of tangent track. The property may need to be acquired from a private owner, but there appears to be sufficient space for a station and platforms. A large parking lot abuts the site which could potentially be expanded for additional parking. The site is close to a relatively dense housing development which provide a rider base.





Columbus Station Locations

Three potential locations were identified for a station in Columbus: in the Franklinton neighborhood, at the Greater Columbus Convention Center, and at the Columbus International Airport.



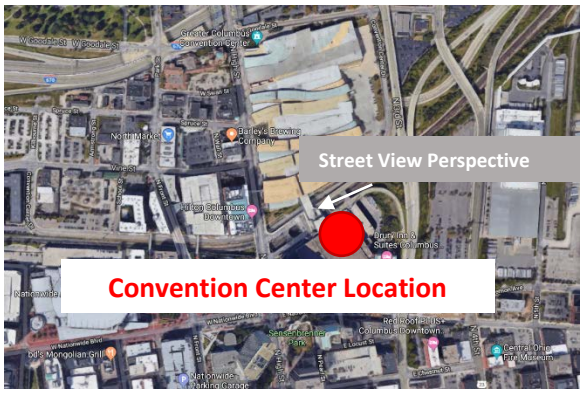
Franklinton was identified by stakeholders as a neighborhood with development potential, which might generate ridership for a rail station. The site identified abuts I-670 and has over 1,000 feet of tangent track, as well as adequate space for a station, platforms, and parking. The site is immediately

north of a Central Ohio Transit Authority facility and parking lot. Road access to the station would need to be created. This location can only be accessed on the Norfolk Southern Buckeye Subdivision ROW.





The Convention Center in downtown Columbus would be an ideal location to connect to Convention Center activities and the central business district. The ROW is below grade in this area, meaning there may be special engineering and siting considerations for the station and platforms. There may be limited ability to build new parking, however existing parking garages are nearby. There is about 800 feet of tangent track and it could be accessed by either the Norfolk Southern or CSX ROWs identified as possible route alignments. To date, stakeholders have expressed the greatest support for the Convention Center location.





The Columbus International Airport as a station site could provide a convenient connection for airport travelers. There is over 1,000 feet of tangent track, as well as sufficient space for a station and platforms. The property may need to be acquired from a private owner. To serve airport passengers, it may be necessary for a shuttle service to ferry riders between the station and the airport.





6.0 Next Steps

As presented in this Route Alternatives Report, preliminary route alternatives and station locations have been identified based on initial stakeholder outreach and a preliminary assessment of existing conditions and infrastructure attributes. The next step for the sponsor would be to select and confirm a preferred alternative alignment and a preferred station location for each stop on the corridor. These efforts reflect FRA's evolving approach to environmental planning in accordance with the National Environmental Policy Act (NEPA), whereby a considerable amount of service planning, environmental analysis, alternatives analysis, and public involvement are undertaken prior to beginning the formal NEPA process. The goal is to initiate NEPA with a solid preliminary purpose and need and a well-defined range of reasonable alternatives.

Pending continued interest to advance pre-NEPA planning of the RSTI Passenger Rail initiative, the following efforts are required to ultimately select a preferred corridor and station locations:

1. Stakeholder and public outreach with local officials, state officials, host railroads, and members of the public to inform route selection and station siting.
2. Ridership forecasting to estimate passenger demand and inform service alternatives.
3. Development of service alternatives to conceptualize expected service levels and infrastructure needs.
4. Estimation of capital, operations, and maintenance costs for preferred alternatives.

Throughout these next steps, the project sponsor should continue to engage FRA with a focus on ultimately issuing a Notice of Intent to enter NEPA. Specific infrastructure needs will determine the NEPA class of action required for a given segment of the corridor to be confirmed with the FRA. Corridor modifications within the confines of existing rail ROW would likely qualify as a Categorical Exclusion (CE) while more significant modifications such as land acquisition for new rail infrastructure would likely require an Environmental Assessment (EA) or an Environmental Impact Statement (EIS) depending upon corridor-adjacent environmental resources affected.

The contents of this Route Alternatives Report, combined with the Existing Conditions Report and Goals and Objectives Report provide a foundation of preliminary information for MORPC and other project sponsors to share and solicit stakeholder support to advance the study of the RSTI Passenger Rail Project. The project sponsors will also want to coordinate with other regional stakeholders such as ODOT and ORDC, as well as gauge private sector interest for passenger rail service and adjacent development opportunities.

Appendix A

Alternative Rail Segment Attributes

Rail Segment	Ownership	Length	Track Rights	Track Configuration	Subdivision	Imputed Track Class	Speed (mph - pct of corridor)	Avg Speed	Signaling	Bridges	Underpasses or Tunnels	Daily Train Volumes	Number of Public At-Grade Crossings	Number of Private at-Grade Crossings	ROW Width (approx.)	Corridor Communities/ Surrounding Land Uses	Geography/ Terrain
Lima - Dunkirk - Kenton	Chicago Fort Wayne & Eastern Railroad & CSX	36	NS, IORY, WE	0,1	Dunkirk-Kenton: CSX Toledo SD	3.4% - Class 2 1.6% - Class 2/3 57.1% - Class 3 37.9% - Class 3/4	25 - 3.4% 35 - 1.6% 40 - 57.1% 50 - 37.9%	43.2	CTC*	3	3	5 to 9	55	24	70-140 feet	Small Town, Rural	Flat
Kenton - Marysville - Columbus	CSX	65.1		1	Kenton-Mt. Victory: Toledo SD; Mt. Victory-Columbus: Scottslawn Secondary	5.8% - Class 2 2.5% - Class 3 91.4% - Class 3/4	20 - 5.8% 40 - 2.5% 49 - 91.4%	47.1	DTC & ABS*	5	2	12 to 19	58	44	65-130 feet	Small Town, Rural	Flat
Columbus - North	Norfolk Southern	6	CSX, NS	0,1,2	Buckeye Branch	100% - Class 2	25 - 100%	25	CTC; Unknown; Manual Block, including dark territory	2	9	7	7	4	45-95 feet	Urban	Flat
Columbus - South	CSX & Norfolk Southern	6.7	CCRA, CSX, IORY	1,2	CSX Scottslawn; NS Buckeye Terminal	16.7% - Class 2 81.7% - Class 2 13.3% - Class3/4	25 - 16.7% 30 - 81.7% 50 - 13.3%	35.3	DTC & ABS*	7	7	12 to 20	5	7	30-110 feet	Urban	Flat
Columbus - Mingo Junction	Norfolk Southern & State of Ohio	124	CUOH, CSX, NS	0,1,2	NS Buckeye Terminal; CUOH C&N SD; CUOH Pan SD	2% - Class 2 3.2% - Class 2 92.8% - Class 2 1.9% - Class 3 0.1% - Class 3/4	20 - 2% 25 - 3.2% 30 - 92.8% 40 - 1.9% 50 - 0.1%	29.8	CTC; Unknown; Manual Block, including dark territory	14	41	4 to 8	118	75	30-250 feet	Small Town, Rural	Flat to hilly
Mingo Junction - Northern Alignment	State of Ohio	20.5	NS	0,1	CUOH Pan SD	3.4% - Class 1 96.6% - Class 2	10 - 3.4% 30 - 96.6%	29.3	Unknown	1	7	5 to 8	10	5	100-250 feet	Rural	Hilly
Mingo Junction - Southern Alignment	Wheeling & Lake Erie Railway	23.5	CSX	0,1	Rook SD	100% - Class 3	40 - 100%	40	Manual Block, including dark territory	5	1	8 to 11	2	11	60-200 feet	Rural	Hilly
Mingo Junction to Pittsburgh - North A	CSX, Norfolk Southern & Private	64.7	PIR, POHC	0,1,2	NS Weirton Secondary; CSX Pittsburgh SD	43.3% - Abandoned 20.3% - Class 1 6.5% - Class 2 30% - Class 3/4	0 - 43.3% 10 - 20.3% 25 - 6.5% 50 - 30%	18.6	CTC; Unknown; Manual Block, including dark territory	16	27	7 to 75	38	34	50-100 feet (WV Portion); 60-200 Feet (PA Portion)	Small Town, Rural	Hilly

Rail Segment	Ownership	Length	Track Rights	Track Configuration	Subdivision	Imputed Track Class	Speed (mph - pct of corridor)	Avg Speed	Signaling	Bridges	Underpasses or Tunnels	Daily Train Volumes	Number of Public At-Grade Crossings	Number of Private at-Grade Crossings	ROW Width (approx.)	Corridor Communities/ Surrounding Land Uses	Geography/ Terrain
Mingo Junction to Pittsburgh - North B	Norfolk Southern	66.7	Amtrak	1,2	Pittsburgh SD - River Line, Cleveland Line, Fort Wayne Line	7.7% - Class 1 27.4% - Class 2/3 32.8% - Class 3 2.3% - Class 3/4 1.35% - Class 4 1.05% - Class 3 13.19% - Class 4 14.24% - Class 4	10 - 7.7% 35 - 27.4% 40 - 32.8% 50 - 2.3% 60 - 1.35% 65 - 1.05% 70 - 13.19% 79 - 14.24%	46.6	River Line: Track Authority; Cleveland Line: ABS	13	21	8 to 60	31	28	60-200 Feet (PA Portion)	Small Town, Rural	Hilly
Mingo Junction to Pittsburgh - South (Kirwan H)	Wheeling & Lake Erie Railway	35.1	CSX	1	Rook SD	0.9% - Class 1 14.5% - Class 2 84.6% - Class 2	10 - 0.9% 25 - 14.5% 30 - 84.6%	29.1	Unknown	20	10	4 to 8	15	6	60-150 (WV Portion), 60-200 (PA Portion)	Rural	Hilly
Kirwan Heights to Dawn Station	Wheeling & Lake Erie Railway	8.4	NS	1	Pittsburgh SD	41.7% - Class 1 58.3% - Class 2	10 - 41.7% 25 - 58.3%	18.8	Unknown	9	4	2	0	5	20-200 Feet	Small Town, Rural, Urban	Hilly
Kirwan Heights to Ohio Connecting Bridge	Pittsburgh & Ohio Central Railroad	9.8	NS	1,2		18.4% - Class 1 81.63% - Class 2	10 - 18.4% 25 - 81.63%	22.2	Unknown; Manual Block, including dark territory	2	4	3 to 9	13	3	20-200 Feet	Urban	Hilly
Pittsburgh - Ohio River West - Lower	CSX	5.4		1,2	Pittsburgh SD - PI	33.3% - Class 2 66.7% - Class 3/4	30 - 33.3% 50 - 66.7%	43.3	CTC; Unknown	1	8	20 to 52	13	3	35-120 Feet	Urban	Hilly
Pittsburgh - Ohio River West - Upper	Norfolk Southern	9.5		1,2	Mon Line	30.5% - Class 2 34.7% - Class 2 34.7% - Class 3	20 - 30.5% 25 - 34.7% 40 - 34.7%	28.7	CTC; Unknown	18	13	18 to 22	14	5	60-200 Feet	Urban	Hilly
Pittsburgh - Downtown to Carnegie Mellon	CSX & Norfolk Southern	3.1	Amtrak, AVR, BPRR	1,2	NS Pittsburgh SD - Pittsburgh Line; CSX P&W SD; CSX W&P SD	71% - Class 2 29% - Class 4	30 - 71% 60 - 29%	38.7	CTC; Unknown; Manual Block, including dark territory	0	11	8 to 59	2	2	35-150 Feet	Urban	Hilly
Pittsburgh - Downtown	Norfolk Southern	5.6	Amtrak, AVR, BPRR	1,2	Pittsburgh SD - Fort Wayne Line, Pittsburgh Line	5.4% - Class 2 10.7% - Class 2 30.4% - Class 2 53.6% - Class 3/4	20 - 5.4% 25 - 10.7% 30 - 30.4% 50 - 53.6%	39.6	ATS; CTC; Unknown	11	12	18 to 59	5	5	60-200 feet (40 feet East of Train Station)	Urban	Hilly

Appendix B

Northern Indiana Passenger Rail Corridor – Route Alternatives Analysis Report