

INTERCITY PASSENGER RAIL CONCEPTUAL INFRASTRUCTURE PLAN

Hoosier State Passenger Rail

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Prepared for:
Indiana Department of Transportation

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PATRICK

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Executive Summary

Indiana Department of Transportation (INDOT), Amtrak, and Patrick Engineering Inc. (Patrick) have completed the Intercity Passenger Rail Conceptual Infrastructure Plan (Plan) for the Hoosier State rail corridor (Corridor). The intent of this Plan is to determine the conceptual scope and cost of upgrading infrastructure improvements that would be required to support a reduction in travel time and increase in frequency for passenger rail service on the Corridor between Chicago, IL and Indianapolis, IN. This Plan focuses on improvements located within the State of Indiana only. The existing Corridor between Munster and Indianapolis is comprised of three (3) railroad subdivisions (Monon Subdivision, Crawfordsville Branch Subdivision, and Indianapolis Terminal Subdivision – Crawfordville Branch), all owned and operated by CSX Transportation (CSXT). Amtrak currently operates passenger service along the Corridor via the Cardinal long-distance service.

This Plan was prepared using available information and without the direct involvement of CSXT. Further coordination with CSXT will be necessary to confirm the assumptions of this Plan and lay the groundwork for future plans and agreements.

Three (3) conceptual service improvement scenarios were evaluated to enhance passenger service along the Corridor: 1) reduce travel time through localized speed improvements, 2) increase service frequency to Two Round Trips per Day (2RT), and 3) increase the maximum authorized speed to 79 mph to reduce the total travel time. Patrick reviewed station locations, train run-time analyses, train schedules, delay locations and delay frequency, infrastructure needs, right-of-way requirements and capital cost estimates. Ridership projections, environmental screening and operation & maintenance costs are not included in this Plan.

The above improvement scenarios were developed based upon discussions with INDOT. Example passenger train schedules were developed for two (2) operating scenarios (i.e. 2RT and 79 mph) to identify where infrastructure improvements would be needed to support the enhanced rail service. Between Chicago Union Station and Indianapolis Union Station, this Plan estimates that the scheduled travel time may be reduced by upwards of thirty (30) minutes for both southbound and northbound trains, using a simplified schedule analysis methodology.

Because the Corridor is currently operating passenger service at a lower speed, along a predominantly single track freight railroad, the proposed upgraded passenger rail service scenarios will require a significant amount of new infrastructure investment to ensure reliable operations.

1. Introduction

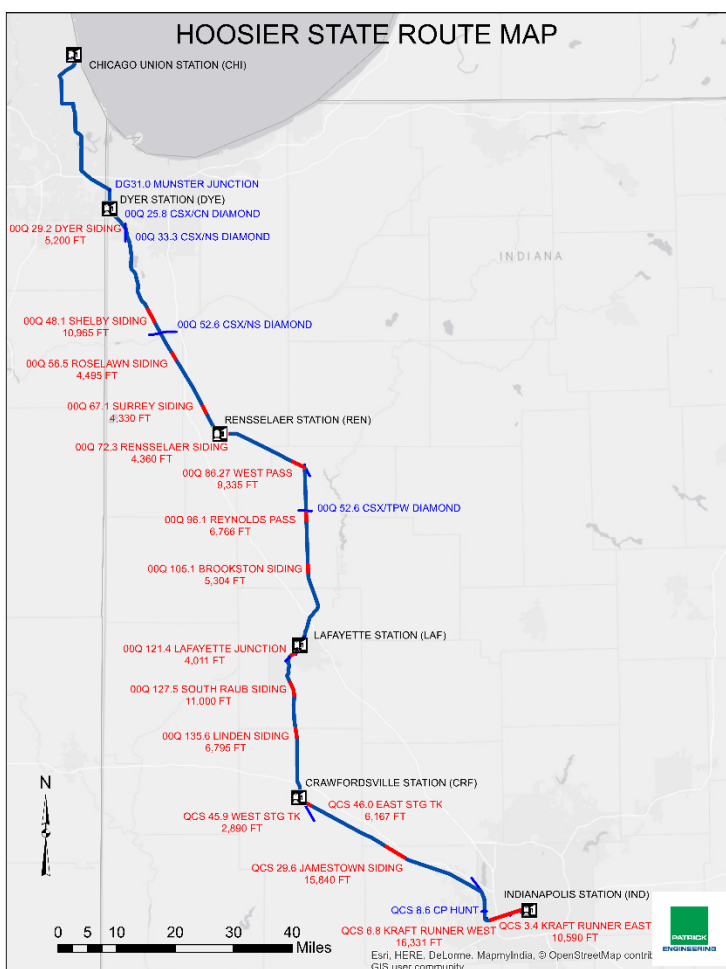
Under the provisions of Section 209 of the Passenger Rail Investment and Improvement Act (PRIIA) of 2008, all short-distance Amtrak Corridor services (less than 750 miles) used for intercity passenger rail service were required to become state-supported to continue, and states were required to pay the proportional costs associated with the corridor route. In Indiana, Section 209 included the Hoosier State, which ran from Indianapolis to Chicago. The Hoosier State operated four (4) day per week, with stops in Indianapolis, Crawfordsville, Lafayette, Rensselaer, and Dyer. On the alternate three (3) days that the Hoosier State did not operate, the Cardinal provided passenger rail service to the same stops, at the same times; effectively providing seven (7) day per week service between Indianapolis and Chicago. Because the Cardinal operates from New York City to Chicago, it exceeds the 750-mile minimum, and is not subject to the funding provisions of Section 209. In general, approximately 30,000 passengers utilize the Hoosier State annually. The current trip time from Chicago Union Station to Indianapolis Union Station is nearly five (5) hours. Delays can have a ripple effect, causing this number to dramatically increase. The same trip can be made via automobile, and takes approximately 3 hours and 15 minutes, with no traffic interference.

The primary function of the Hoosier State was not to provide intercity passenger service that was faster than driving, but rather, a service that was consistent, convenient, and, if possible, at a relatively similar travel time.

INDOT initiated the Intercity Passenger Rail Conceptual Infrastructure Plan to evaluate possible infrastructure improvements on the existing rail corridor, between Munster and Indianapolis, resulting from three (3) conceptual service improvement scenarios. This rail line is owned and operated by CSXT.

The limits of the Plan begin at Munster Junction (MP 00Q 25.7), near the Indiana/Illinois border and end at Indianapolis Union Station (MP QSC 0.7); a total length of approximately 169 miles. As illustrated in Figure 1, the limits are completely contained within the State of Indiana.

Figure 1 – Hoosier State Route Map



2. Other Studies in the Area

Hoosier State Rail Service Cost Benefit Analysis (2013)

The Hoosier State Rail Service Cost Benefit Analysis evaluated the costs and benefits of maintaining, improving, or discontinuing the Hoosier State passenger rail service between Chicago and Indianapolis. Additionally, the study sought to identify a long-term plan for the communities at/near the existing stations; goals and targets of the communities at/near the existing stations, and identify a funding source(s) for continued passenger rail services between Chicago and Indianapolis. The report concluded that the capital, operation, and maintenance costs exceeded the total monetized benefit; therefore, funding the continuation or improvement of the Hoosier State was not an economic, but rather a policy decision.

3. Assumptions

The following assumptions have been made to simplify the analysis required for the plan:

1. The former Hoosier State will be converted from quad-week train service (previous) to a daily service, with two (2) round trips per day.
2. Hours of freight operation will be 24-hours per day, seven days per week.
3. Passenger trains will have priority over freight trains.
4. Sidings will be extended to a minimum of 15,840 feet (3-miles), which CSXT has indicated is the railroad's "new" standard siding length. Locations of existing sidings were identified from CSXT Timetables dated 2015. Sidings will be equipped with power switches. Hand thrown and spring switches on the mainline will be eliminated.
5. CSXT will complete the installation of a Positive Train Control (PTC) system, as mandated by the 2008 Railroad Safety Improvement Act. The effects of PTC on line capacity are not considered in this Plan.
6. Existing train counts were originally provided by CSXT in 2013. Said counts were compared against current (2017) US DOT Crossing Inventory Forms along the route. The maximum train count, for each segment, was used in this analysis.
7. Future freight train growth according to the Association of American Railroads (AAR) is 1.36% per year over 30 years, as recommended by the Federal Highway Administration (FHWA) Office of Freight Management and Operations.¹
8. The existing track class (Class 3) is sufficient for CSXT. For the Hoosier State to achieve a maximum allowable operating speed of 79 mph, the existing track will be upgraded to allow for safe passenger operation at 79 mph. Therefore, any capital improvement costs, as well as on-going inspections and maintenance costs, to meet this higher track standard, will be the financial responsibility of INDOT and other financial supporters.
9. Speeds are adjusted by acceleration and deceleration on the line entering and exiting sidings, stations stops, operations through communities, and as required by track geometry (e.g. tight horizontal curves, junctions, etc.)

¹ "Overview of America's Freight Railroads." Association of American Railroads, August 2017, <https://www.aar.org/BackgroundPapers/Overview%20of%20America's%20Freight%20RRs.pdf>

4. Proposed Hoosier State Operating Scenario

Based upon conversations with the Indiana Department of Transportation (INDOT), the preferred improvement scenario provides for two (2) daily, Hoosier State round trips, while maintaining the tri-weekly Cardinal Service between Indianapolis and Chicago; with a view toward upgrading the maximum authorized train speed for passenger trains from 60 mph to 79 mph. Prerequisite agreements and infrastructure improvements on the Hoosier State will also need to be complete prior to implementation of the proposed service scenario.

At the Dyer Station, passengers would transfer from the Hoosier State to the NICTD West Lake commuter platform to access intercity passenger trains into Chicago - Millennium Station.

5. Proposed Hoosier State Schedule

A run time analysis was performed for westbound and eastbound intercity trains to establish a baseline for developing train schedules assuming a maximum authorized speed of 60 mph. The run time is the time it takes for a train to travel between Indianapolis Union Station and Dyer Station including deceleration to and acceleration from a stop, at each location.

This analysis was conducted using a Microsoft Excel simulation developed by Patrick for this project that calculates train acceleration/deceleration and resulting velocity. The simulation utilizes industry standard formulas to adjust train performance to account for resistance associated with rolling resistance and wind resistance (Davis Equation). The typical deceleration rate was derived from Amtrak's General Electric Genesis locomotive. All proposed Hoosier State train schedules shown in this report are dependent upon schedule timeslots made available to Amtrak, by the host railroads. Scheduled timeslots provided are subject to further discussion based upon rail traffic volumes, operating conditions, and other considerations in existence at the time of actual service commencement.

Using Amtrak's standard methodology and reflecting the maximum authorized timetable operating speeds, station dwell times, and recovery time, "strawman" schedules are depicted below.

Table 1-1: Current Schedule – One (1) Round Trip

Morning (Westbound)	Evening (Westbound)					Morning (Eastbound)	Evening (Eastbound)
6:00 AM	---	Dp	INDIANAPOLIS, IN (ET)	AR		---	11:39 PM
6:58 AM	---	Dp	Crawfordsville, IN	Dp		---	10:20 PM
7:36 AM	---	Dp	Lafayette, IN (ET)	Dp		---	9:46 PM
7:40 AM	---	Dp	Rensselaer, IN (CT)	Dp		---	7:35 PM
8:29 AM	---	Dp	Dyer, IN	Dp		---	6:44 PM
10:00 AM	---	Ar	CHICAGO, IL (CT)	Dp		---	5:45 PM

Table 1-2: Proposed Schedule for Two (2) Daily Round Trips

Morning (Westbound)	Evening (Westbound)					Morning (Eastbound)	Evening (Eastbound)
7:30 AM	5:30 PM	Dp	INDIANAPOLIS, IN (ET)	AR		1:00 PM	10:00 PM
8:28 AM	6:28 PM	Dp	Crawfordsville, IN	Dp		12:02 PM	9:02 PM
9:06 AM	7:06 PM	Dp	Lafayette, IN (ET)	Dp		11:24 AM	8:24 PM
9:10 AM	7:10 PM	Dp	Rensselaer, IN (CT)	Dp		9:20 AM	6:20 PM
9:59 AM	7:59 PM	Dp	Dyer, IN	Dp		8:31 AM	5:31 PM
11:30 AM	9:30 PM	Ar	CHICAGO, IL (CT)	Dp		7:00 AM	4:00 PM

Table 1-3: Proposed Schedule for Two (2) Daily Round Trips with a Maximum Operating Speed of 79 MPH

Morning (Westbound)	Evening (Westbound)					Morning (Eastbound)	Evening (Eastbound)
7:30 AM	5:30 PM	Dp	INDIANAPOLIS, IN (ET)	AR		12:36 PM	9:36 PM
8:23 AM	6:23 PM	Dp	Crawfordsville, IN	Dp		11:43 AM	8:43 PM
8:58 AM	6:58 PM	Dp	Lafayette, IN (ET)	Dp		11:08 AM	8:08 PM
8:57 AM	6:57 PM	Dp	Rensselaer, IN (CT)	Dp		9:09 AM	6:09 PM
9:42 AM	7:42 PM	Dp	Dyer, IN	Dp		8:24 AM	5:24 PM
11:06 AM	9:06 PM	Ar	CHICAGO, IL (CT)	Dp		7:00 AM	4:00 PM

6. Proposed Infrastructure Improvements

The proposed service improvement scenarios within this Plan will require significant infrastructure improvements to increase speed and operational reliability. Below is a detailed explanation of the proposed infrastructure improvements, as required to support each scenario.

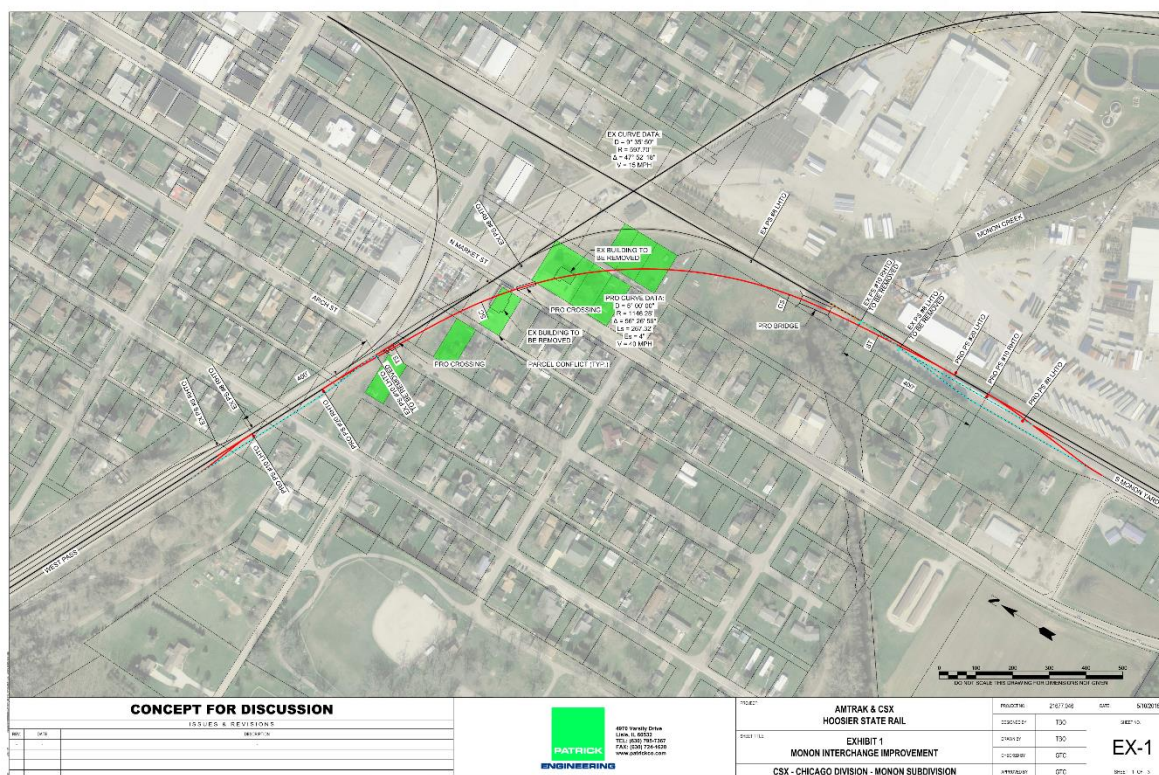
1. Local Speed Improvements

For this scenario, improvements would be made along the corridor to eliminate existing speed restrictions at specific locations, resulting in reduced overall travel time of six (6) minutes based on current maximum authorized speeds before and after speed restrictions.

1.1 Monon Realignment

The Corridor currently traverses through the diverging route of two (2) existing turnouts at the junction of CSX's Medaryville and Pioneer Railcorp's Monticello industrial tracks. The maximum authorized speed through the existing curve is 15 mph for both passenger and freight trains. The proposed realignment would allow for train speeds of 40 mph, reducing the overall travel time by 1 minute, 30 seconds based on the current maximum authorized speeds of 60 mph before and after the curve.

Figure 2 – Conceptual Monon Interchange Improvement



Railroad Bridges

A new railroad bridge would need to be constructed to accommodate the proposed track infrastructure.

Table 2 – Proposed Railroad Bridges

Milepost	Name	Proposed Improvement	Approx. Length
00Q 88.49	Monon Creek (McKillip Ditch)	New Single Track Bridge Adjacent to Existing	85'

Project Capital Cost: \$7.5 Million

1.2 Local Speed Restrictions

There are two (2) local agencies, the Towns of Battle Ground and Jamestown, which have passed local laws/ordinances that limit the maximum authorized speed trains can operation within their jurisdictional limits. Therefore, the proposed project seeks to make at-grade crossing and fencing improvements to allow for the safe operation of passenger trains at an increased speed. Benefits include a reduction in travel time by 2 minutes, 14 seconds based on the current maximum authorized speeds of 60 mph and 59 mph before and after the speed restrictions at Battle Ground and Jamestown, respectively.

Project Capital Cost: \$4 Million

1.3 Reynolds At-Grade Railroad Crossing

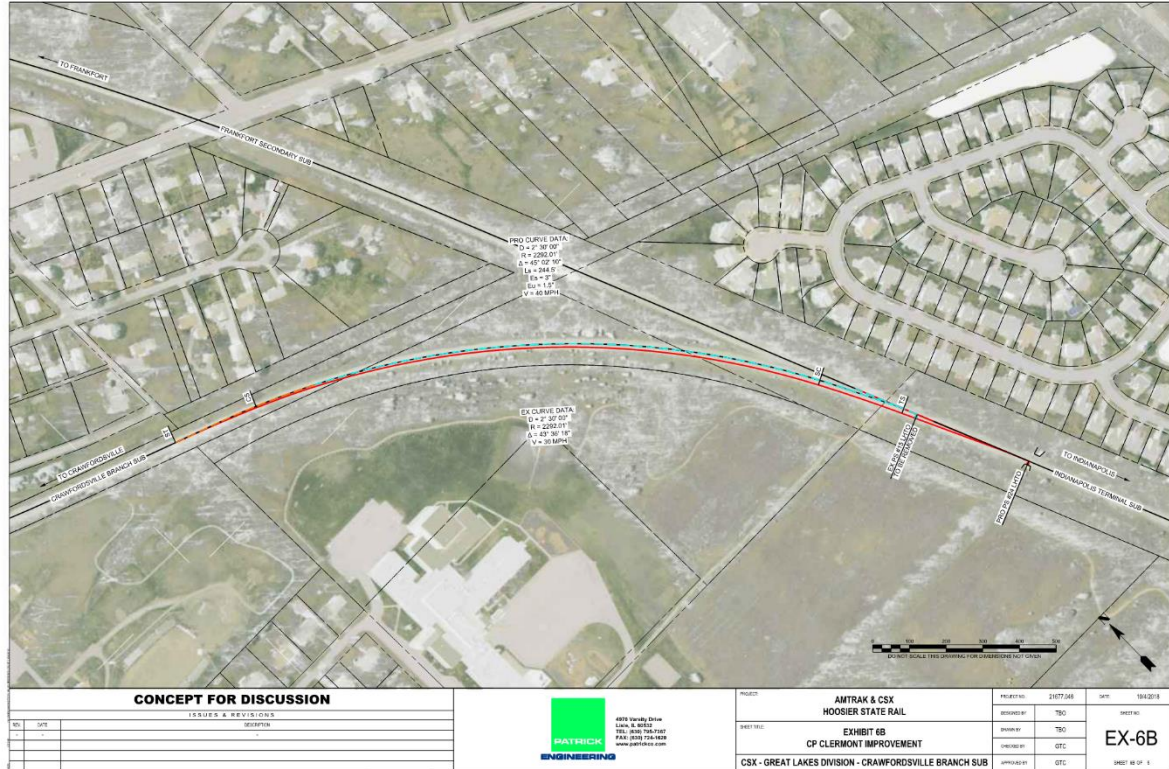
This project will eliminate the existing speed restriction in Reynolds, Indiana. The project includes replacing the existing crossing diamond and upgrading/replacing the electronic interlocking to allow for the safe operation of passenger trains at a higher speed. Benefits include a reduction in travel time by 53 seconds based on the current maximum authorized speeds of 60 mph before and after the speed restriction.

Project Capital Cost: \$3 Million

1.4 CP Clermont

The Corridor currently traverses through the diverging route of an existing turnout and 2° 30' curve at a maximum authorized speed of 30 mph for both passenger and freight trains. The proposed realignment would allow for train speeds of 40 mph, thus reducing the travel time by 1 minute based on the current maximum authorized speeds of 40 mph and 60 mph before and after the curve.

Figure 3 – Conceptual CP Clermont Improvement



Project Capital Cost: \$3 Million

2. Two (2) Daily Roundtrips

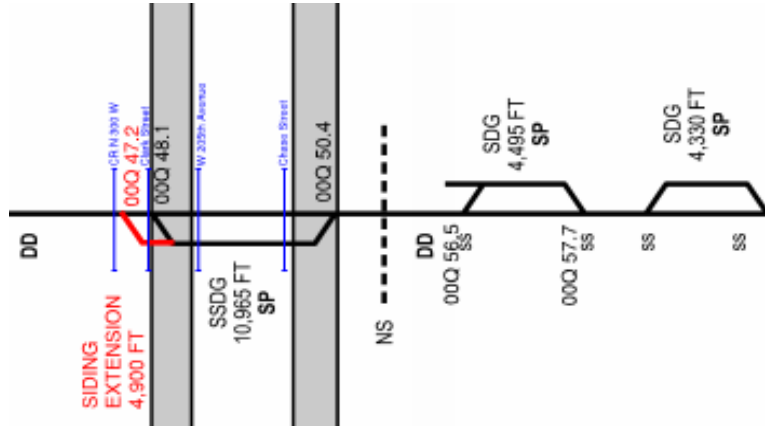
For this scenario, improvements would be made along the corridor to increase capacity and reliability to allow two (2) daily roundtrips within the corridor, including modifications to or construction of new passing sidings, and elimination of existing bottlenecks.

2.1 Shelby Siding Extension

The existing siding is located approximately 1.65 miles north of Shelby. This siding begins at MP 00Q 48.1, approximately 200 feet south of Clark Street (DOT # 341182E | MP 00Q 48.06) and extends approximately 2.07 miles south to MP 00Q 50.4. The existing turnouts appear to be #20, power-operated switches. Currently, the siding is bisected by W 205th Avenue (DOT # 341183L | MP 00Q 48.36) and Chase Street (DOT # 341186G | MP 00Q 50.23); leaving a clear length of approximately 9,700 feet between crossings. Amtrak is **not** permitted to operate on this siding without permission from the chief dispatcher and is required to reverse out of said siding.

This project would extend the existing siding north approximately 4,900 feet, for a total siding length of approximately 15,860 feet. By grade separating and/or closing Clark Street and W 205th Avenue the total clear length would be increased to approximately 15,600 feet.

Figure 4 – Conceptual Shelby Siding Extension



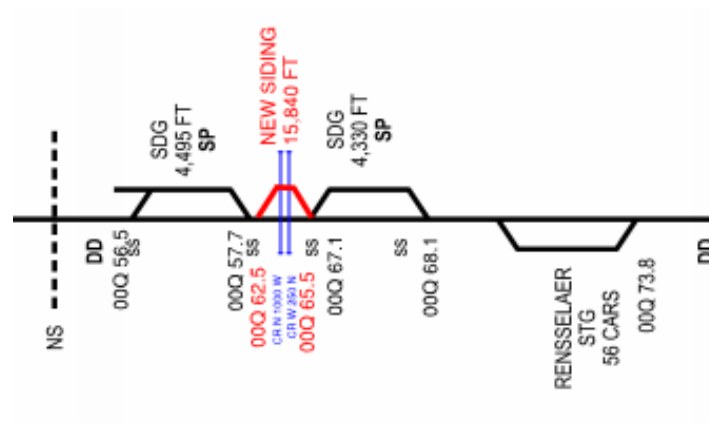
Project Capital Cost: \$9.5 Million

2.2 New Surrey Siding

The existing siding is located at MP 00Q 67.1, approximately 1 mile south of Parr. Said siding begins approximately 800 feet south of Division Road (DOT # 341208E | MP 00Q 66.92) and extends approximately 1 mile south to MP 00Q 68.1. The existing turnouts at each end appear to be #12 spring switches. Currently, the siding is bisected by CR S 850 W (DOT # 341209L | MP 00Q 67.18) and Surrey Road (DOT # 341210F | MP 00Q 68.06), for a clear length of approximately 4,500 feet between crossings. Amtrak is permitted to use this siding, when necessary, for train meets or when directed by the train dispatcher.

This project would relocate/construct a new 15,840 foot long siding, approximately 0.25 miles north of Parr, between MP 00Q 62.5 and MP 00Q 65.5. CR N 1000 W (DOT # 341204C | MP 00Q 63.94) is classified as a Major Collector, with a 2017 AADT of approximately 291 vehicles/day. CR W 250 N (DOT # 341205J | MP 00Q 64.08) is classified as a Local Road, with an unknown current AADT. This project includes construction of a grade separated crossing at CR N 1000 W and closing CR W 250 N, providing a clear length of approximately 15,840 feet.

Figure 5 – Conceptual Surray Siding Relocation



Railroad Bridges

A new railroad bridge would need to be constructed to accommodate the proposed track infrastructure.

Table 3 – Proposed Railroad Bridges

Milepost	Name	Proposed Improvement	Approx. Length
00Q 65.10	Little Iroquois	New Single Track Bridge Adjacent to Existing	40'

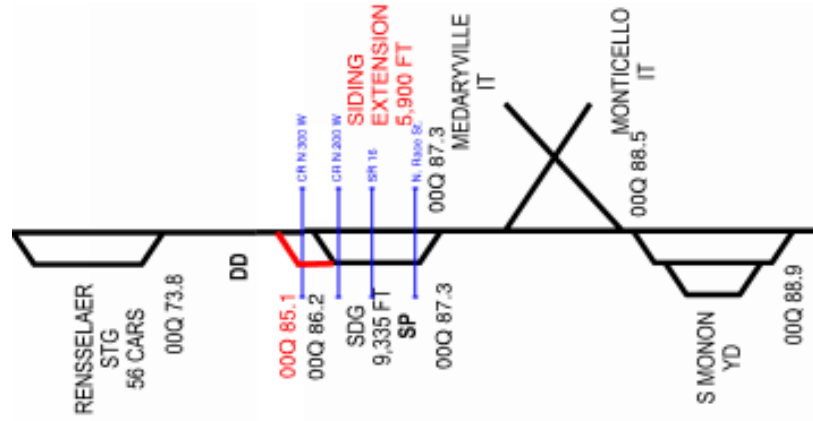
Project Capital Cost: \$13.5 Million

2.3 West Pass Siding Extension

The existing siding is located at MP 00Q 86.1, in Monon. This siding begins approximately 1,500 feet west of CR N 200 W (DOT # 341245G | MP 00Q 86.47) and extends approximately 1.77 miles east to MP 00Q 87.9. The existing turnouts at each end appear to be #10, hand-operated turnouts. Currently, the siding is bisected by CR N 200 W, SR 16 (DOT # 341246N | MP 00Q 87.14), and N Race Street (DOT # 341247V | MP 00Q 88.18); leaving a maximum clear length of approximately 5,600 feet between SR 16 and N Race Street. Based upon the available information it appears the siding can hold a $9,335 \pm$ foot long train clear of crossings at CR N 200 W, SR 16, and N Race Street. Amtrak is **not** permitted to operate on this siding without permission from the chief dispatcher and is required to reverse out of said siding.

This project would extend the existing siding west approximately 6,400 feet, for a total siding length of approximately 15,860 feet. SR 16 is classified as a Major Collector, with a 2017 AADT of approximately 1,772 vehicles/day. CR N 300 W (DOT # 341243T | MP 00Q 85.37) and CR N 200 W are classified as Local Roads. In addition to extending the existing siding, this project includes construction of a grade separated crossing at SR 16 and closing CR N 200 W, providing a clear length of approximately 14,800 feet.

Figure 6 – Conceptual West Pass Siding Extension



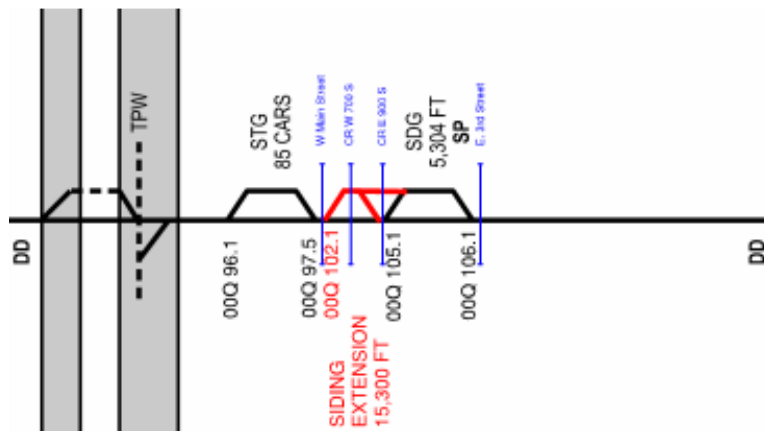
Project Capital Cost: \$10 Million

2.4 Brookston Siding Extension

The existing siding is located in Brookston, and begins at MP 00Q 105, near CR E 900 S. (DOT # 341285E | MP 00Q 104.97) and extends approximately 1 mile south to MP 00Q 106.1. The existing turnouts at each end appear to be #10, hand-operated turnouts. Two (2) industry tracks are located adjacent to the siding; therefore, switch point derails are located at each end; leaving a clear length of approximately 5,304 feet between derails. Amtrak is **not** permitted to operate on this siding without permission from the chief dispatcher and is required to reverse out of said siding.

This project would install a universal crossover at MP 00Q 105 and extend the existing siding north approximately 15,300 feet, thus mitigating impacts to the local industry freight operations. CR E 700 S (DOT # 341282J | MP 00Q 102.99) is classified as a Local Road, with unknown traffic volumes. In addition to extending the siding, this project includes closing CR E 700 S and extending CR S 50 E, 1 mile south to CR E 700 S, or grade separating CR E 700 S, providing a clear length of approximately 15,300 feet.

Figure 7 – Conceptual Brookston Siding Extension



Railroad Bridges

A new railroad bridge would need to be constructed to accommodate the proposed track infrastructure.

Table 4 – Proposed Railroad Bridges

Milepost	Name	Proposed Improvement	Approx. Length
00Q 103.93	Carr's Ditch	New Single Track Bridge Adjacent to Existing	34'

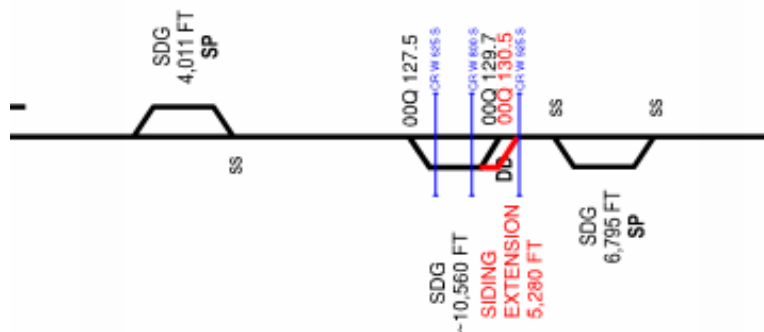
Project Capital Cost: \$11 Million

2.5 South Raub Siding Extension

The existing siding is located approximately 7 miles south of Lafayette, near South Raub. This siding begins at MP 00Q 127.5, approximately 850 feet north of CR W 625 S (DOT # 341357F | MP 00Q 127.61) and extends approximately 2.2 miles south to MP 00Q 129.7. The existing turnouts appear to be #20, power-operated switches. Currently, the siding is bisected by CR W 625 S and CR W 800 S (DOT # 341360N | MP 00Q 129.45); leaving a clear length of approximately 9,800 feet between crossings. Amtrak is **not** permitted to operate on this siding without permission from the chief dispatcher and is required to reverse out of said siding.

This project would extend the existing siding south approximately 5,300 feet, for a total siding length of approximately 15,860 feet. This project includes grade separating and/or closing CR W 800 S, increasing the total clear length to approximately 15,860 feet.

Figure 8 – Conceptual South Raub Siding Extension



Project Capital Cost: \$9.5 Million

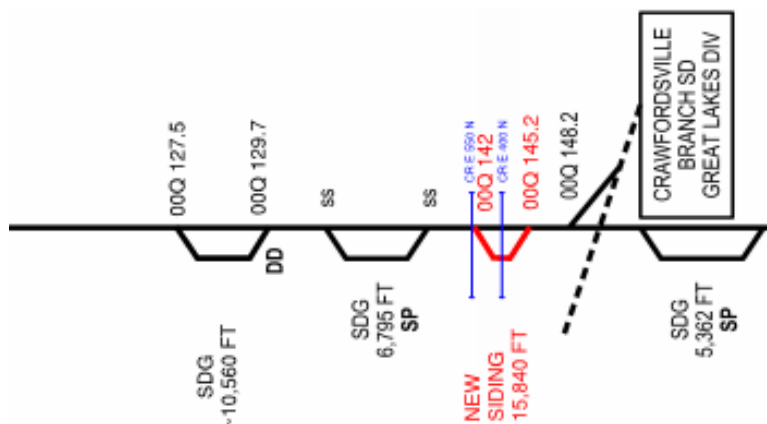
2.6 New Siding – Cherry Grove

Currently a single main track runs between Linden Siding (MP 00Q 136.8) and Crawfordsville Branch Subdivision (MP 00Q 148.2), a distance of approximately 11.4 miles. Industry tracks are located between

MP 00Q 142.1 and MP 00Q 142.4, and near MP 00Q 145.2. CR E 400 N (DOT # 341390F | MP 00Q 143.55) is classified as a Local Road, with an unknown traffic volume.

This project would construct a new 15,840 foot long siding, approximately 4 miles north of Crawfordsville, near Cherry Grove (Indiana), between MP 00Q 142 and MP 00Q 145.2. This project would also close the CR E 400 N at-grade crossing, providing a clear length of nearly 15,840 feet.

Figure 9 – Conceptual New Cherry Grove Siding



Railroad Bridges

There are several locations where new railroad bridges would need to be constructed to accommodate the proposed track infrastructure.

Table 5 – Proposed Railroad Bridges

Milepost	Name	Proposed Improvement	Approx. Length
00Q 142.42	Black Creek	New Single Track Bridge Adjacent to Existing	42'
00Q 143.38	Unnamed Stream	New Single Track Bridge Adjacent to Existing	18'

Project Capital Cost: \$10.5 Million

Lafayette Yard

Currently, the mainline track runs through the middle of Lafayette Yard. Lafayette Yard cannot accommodate a train over 3,750 feet long on a single track. Therefore, freight trains routinely occupy the mainline while switching cars and/or doubling over an arriving/departing train. Additionally through trains are limited to 20 mph. This proposed project would extend existing yard lead tracks and add additional crossovers, thus improving operating flexibility and capacity for existing and anticipated service levels.

CONCEPT FOR DISCUSSION

ISSUES & REVISIONS

REV	DATE	DESCRIPTION

PROJECT
AMTRAK & CSX
HOOSIER STATE RAIL

PROJECT TITLE
EXHIBIT 2
LAFAYETTE YARD IMPROVEMENT

CSX - CHICAGO DIVISION - MONON SUBDIVISION

PROPOSED	EXISTING	DATE
2" X 1/8"	150	1/1/10
2" X 1/8"	150	1/1/10
2" X 1/8"	150	1/1/10
2" X 1/8"	150	1/1/10

EX-2

SCALE
0 100 200 300 400 500 600 700 800 900 1000

PROJECT
AMTRAK & CSX
HOOSIER STATE RAIL

PROJECT TITLE
EXHIBIT 2
LAFAYETTE YARD IMPROVEMENT

CSX - CHICAGO DIVISION - MONON SUBDIVISION

PROPOSED
2" X 1/8"

EXISTING
150

DATE
1/1/10

SCALE
0 100 200 300 400 500 600 700 800 900 1000

PROJECT
AMTRAK & CSX
HOOSIER STATE RAIL

PROJECT TITLE
EXHIBIT 2
LAFAYETTE YARD IMPROVEMENT

CSX - CHICAGO DIVISION - MONON SUBDIVISION

PROPOSED
2" X 1/8"

EXISTING
150

DATE
1/1/10

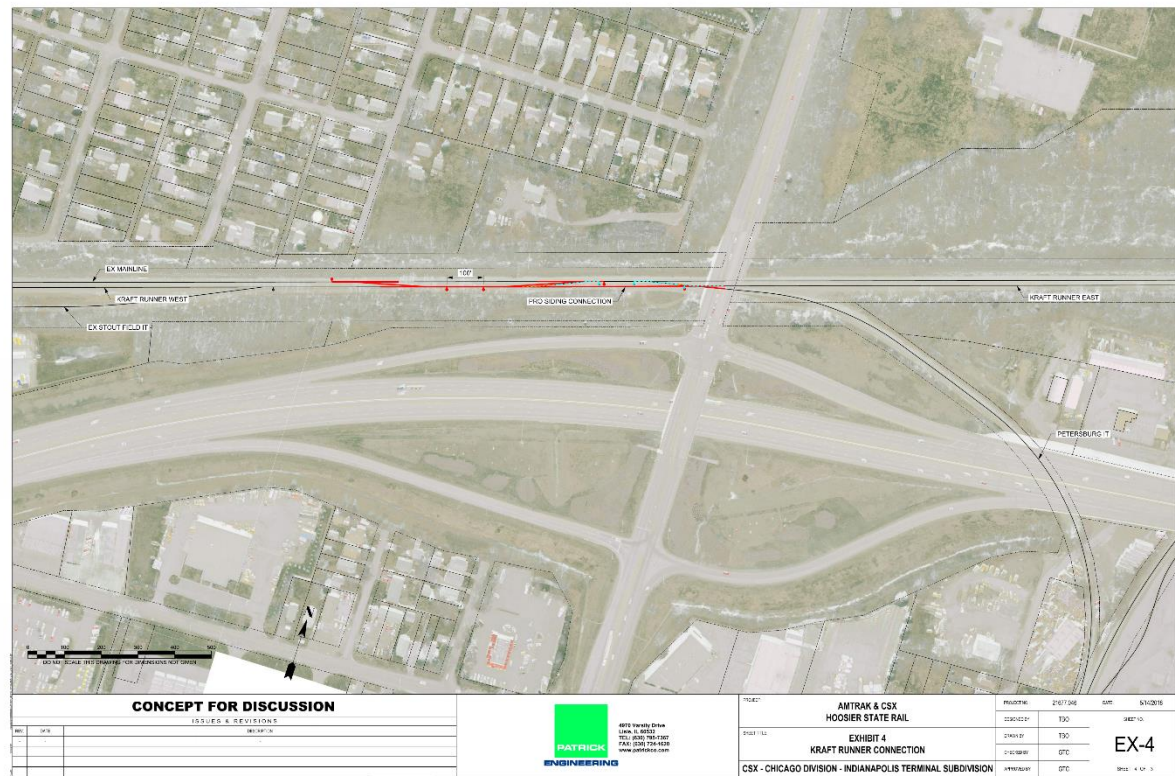
SCALE
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A new railroad bridge would need to be constructed to accommodate the proposed track infrastructure.

Milepost	Name	Proposed Improvement	Approx. Length
00Q 117.85	Widewater	New Single Track Bridge Adjacent to Existing	160'

Currently the Kraft Runner West and Kraft Runner East tracks are separated by a short segment of single track, creating a bottle-neck. This project would connect the Kraft Runner tracks with a universal crossover, creating a 28,000 foot long siding. Benefits include improving operating flexibility and capacity for existing and anticipated service levels.

Figure 11 – Conceptual Kraft Runner Connection



Project Capital Cost: \$2.5 Million

3. Speed Improvements (79 MPH)

For this scenario, improvements would be made along the corridor to increase the overall passenger train speed to a maximum of 79 mph. Currently, passenger trains within the Corridor run at a maximum authorized speed of 60 mph. This project would rehabilitate the existing mainline track, install new high speed turnouts, add/replace active warning devices at every highway-rail grade crossing, and upgrade/replace the electronic signal systems to allow for the safe operation of passenger trains at a higher speed. Benefits include a reduction in travel time of 32 minutes between Munster Junction and Indianapolis Union Station, improved reliability, providing an alternate mode of transportation to driving, and increases in ridership.

Table 7: Summary of Improvement to Support a Max. Speed of 79 mph

CSX Milepost	CSX Milepost	Capital Cost	Track & Structures	Crossings	Signal Systems
00Q 25.7	00Q 33.6	\$6M			
00Q 33.6	00Q 43.3	\$23M			
00Q 43.3	00Q 45.1	\$1.5M			
00Q 45.1	00Q 72.3	\$62M			
00Q 73.2	00Q 88.3	\$33.5M			
00Q 88.5	00Q 117	\$60M			
00Q 117	00Q 126.4	\$7M			
00Q 126.4	00Q 145.3	\$41.5M			
QSC 45.2	QSC 13.4	\$72.5M			
QSC 12.6	QSC 0.0	\$9.5M			

Project Capital Cost: \$316.5 Million

Railroad-Roadway At-Grade Crossings

All at-grade crossings within the corridor shall be equipped with automatic warning devices (flashing lights and gates) Train detection circuits for each crossing would need to be lengthened to accommodate higher train speeds. Also for estimate purposes, it is assumed that all existing crossing surfaces will be renewed.

Signal and Communications System

Train movements along the Monon and Crawfordsville Branch Subdivisions are generally governed by Track Warrant Control (TWC) authorities provided verbally via radio by the CSXT train dispatcher. These authorities are written down by the train crew and repeated to the dispatcher before any movement can occur. Therefore, for an intercity passenger rail system to operate efficiently, and reliability, a modern Traffic Control System (TCS) with Positive Train Control (PTC) would need to be installed. The TCS system would include wayside signals for providing train movement authority by signal indication to the train crews. PTC is a GIS-based safety technology capable of preventing train-to-train collisions, over-speed derailments, unauthorized incursions into work zones and train movements through switches left in the wrong position. The PTC system was mandated through the Rail Safety Improvement Act of 2008 for all lines that carry passenger trains.

4. Indianapolis International Airport Station

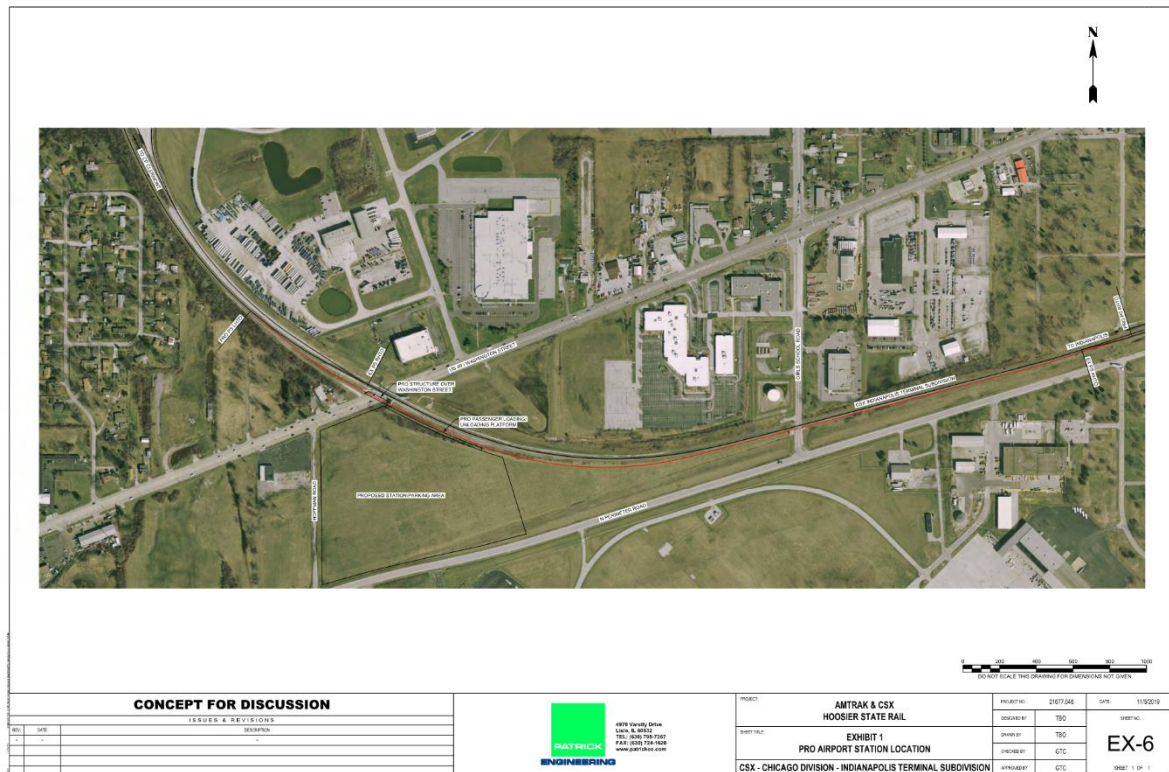
For this scenario, a new station would be added near the Indianapolis International Airport. The proposed location is an existing open lot, bounded by North Perimeter Road, Hoffman Road, US 40, and the CSXT Indianapolis Terminal – Crawfordsville Branch Subdivision mainline. Due to the site bordering the track along an existing curve whose degree of curvature does not meet the minimum AREMA requirements for station platforms, a second track would need to be constructed to the south/west of the existing track. The existing track is elevated, and crosses US 40 on a grade-separated structure that was constructed in 2005.

This project would construct a new station/platform and parking, and approximately 1 mile of new second track, starting north of the existing US 40 grade separation, and tying into the existing west end of the Kraft Runner West track. This project would include a new grade-separated structure for the second track, new track/turnouts, signal system improvements, and crossing warning system and surface improvements at the Girls School Road at-grade roadway crossing (DOT # 545080C | MP QSC 7.16).

Alternatively, there is existing open space approximately 0.5 miles east of the Girls School Road at-grade roadway crossing that could also accommodate a new station/platform and parking. This location is along existing tangent track, so new track or signal work would likely not be necessary.

Project Capital Cost: \$16 Million (Station + New Track), \$10 Million (Station Only)

Table 12: Conceptual Indianapolis International Airport Station



7. Probable Cost Estimate

An estimate of probable capital costs was developed for two (2) of the proposed service scenarios (i.e. 2RT and 79 mph) based on the infrastructure improvements identified in Section 6.

Assumptions

It is important to note that preliminary engineering, construction, operating, and other agreements between CSXT, and operator of the intercity passenger services will need to be in place before construction, and changes to schedule and frequency of service. CSXT or other crossing railroads may require additional improvements in the agreements that are not accounted for in these cost estimates. It should be noted that any passenger service improvements in Illinois require extensive coordination and agreements with those railroads as well for preliminary engineering, construction, and operation.

The cost estimates assume the existing right-of-way remain under the ownership of CSXT. Right-of-way acquisition is assumed only where needed to contain construction limits.

Professional Services

Professional services such as environmental planning, engineering, construction management, and administration are accounted for as a 28% of the construction sub-total cost. The breakdown of professional services is as follows:

Project Management for Design and Construction	3%
NEPA Planning, Preliminary Design, Survey, and Geotech.	6%
Final Design	8%
Construction Administration and Management	8%
Construction Inspection	<u>3%</u>
	28%

Contingency

Due to the conceptual nature of this study, a 30% contingency factor is applied to all construction costs. This contingency covers the costs associated with engineering details that are not yet known as well as unexpected costs during construction.

Table 8-1: Order of Magnitude Estimate for Improvements Required to Support Two (2) Daily Round Trips

MAIN WORKSHEET			Issue Date 5/4/16	
Grantee Name: Indiana Department of Transportation			Today's Date	
Project Name and Location: Hoosier State CSX Track Upgrade (MP QSC 0.0 - MP 00Q 25.7)			Yr of Base Year \$	
Current Phase : Order of Magnitude Estimate			Yr of Revenue Ops	
			10/31/19	
			2019	
			2024	

STANDARD COST CATEGORY	UNITS	QUANTITY	UNIT PRICE	BASE YEAR DOLLARS		
				TOTAL	PERCENTAGE OF CONSTRUCTION COSTS	PERCENTAGE OF TOTAL PROJECT COSTS
10 GUIDEWAY & TRACK ELEMENTS				\$ 46,080,000	53%	31%
10.010 Guideway: At-grade exclusive right-of-way	Lineal Miles of Guideway			\$ -		
10.020 Guideway: At-grade semi-exclusive (allows cross-traffic)	Lineal Miles of Guideway			\$ -		
10.030 Guideway: At-grade in mixed traffic	Lineal Miles of Guideway			\$ -		
10.040 Guideway: Aerial structure	Lineal Miles of Guideway			\$ -		
10.041 Bridges, Culverts, Drainage Improvements (Existing)	Square Feet of Structure			\$ -		
10.041 Bridges, Culverts, Drainage Improvements (New Sidings/Extensions)	Square Feet of Structure	7600	\$ 800	\$ 6,080,000		
10.050 Guideway: Built-up fill	Lineal Miles of Guideway			\$ -		
10.060 Guideway: Underground cut & cover	Lineal Miles of Guideway			\$ -		
10.080 Guideway: Retained cut or fill	Lineal Miles of Guideway			\$ -		
10.090 Track: Direct fixation	Track Miles			\$ -		
10.100 Track: Embedded	Track Miles			\$ -		
10.110 Track: Ballasted	Track Miles			\$ -		
10.111 Track: Ballasted, Rehabilitate (Mainline)	Track Miles			\$ -		
10.112 Track: Ballasted (New Sidings/Extensions)	Track Miles	13	\$ 1,250,000	\$ 16,250,000		
10.113 Track: Ballasted, Rehabilitate (Sidings)	Track Miles	6	\$ 750,000	\$ 4,500,000		
10.114 Track: Ballasted, Curve Modification (Speed)	Track Miles			\$ -		
10.115 Track: Ballasted, Industry Track Improvements/Adjustments (FTI)	Each	8	\$ 1,000,000	\$ 8,000,000		
10.120 Track: Special (higher speed switches, turnouts)	Each	19	\$ 500,000	\$ 9,500,000		
10.121 Track: Special (switches, turnouts)	Each	14	\$ 125,000	\$ 1,750,000		
10.130 Track: Vibration and noise dampening	Track Miles			\$ -		
10.140 Special Structures	Lineal Miles of Guideway			\$ -		
20 STATIONS, STOPS, TERMINALS, INTERMODAL				\$ -	0%	0%
30 SUPPORT FACILITIES				\$ -		
				\$ -	0%	0%
				\$ -		
40 SITEWORK & SPECIAL CONDITIONS				\$ 30,000,000	34%	20%
40.010 Demolition, Clearing, Earthwork	Lineal Miles of Guideway			\$ -		
40.020 Site Utilities, Utility Relocation	Lineal Miles of Guideway			\$ -		
40.030 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments	Lineal Miles of Guideway			\$ -		
40.040 Environmental mitigation, e.g. wetlands, historic/archeologic, parks	Lineal Miles of Guideway			\$ -		
40.050 Site structures including retaining walls, sound walls, fencing	Lineal Miles of Guideway	3	\$ 500,000	\$ 1,500,000		
40.060 Pedestrian / bike access and accommodation, landscaping	Lineal Miles of Guideway			\$ -		
40.070 Automobile, bus, van accessways including roads, parking lots				\$ -		
40.071 Road Closures	Each	4	\$ 50,000	\$ 200,000		
40.072 Grade Crossings	Each	6	\$ 50,000	\$ 300,000		
40.073 Grade Separations	Each	4	\$ 7,000,000	\$ 28,000,000		
40.080 Temporary Facilities and other indirect costs during construction	Lineal Miles of Guideway			\$ -		
50 SYSTEMS				\$ 11,125,000	13%	7%
50.010 Train control and signals	Track Miles	15	\$ 575,000	\$ 8,625,000		
50.020 Traffic signals and crossing protection	Each			\$ -		
50.021 CWT gate system - Existing	Each	2	\$ 250,000	\$ 500,000		
50.022 CWT gate system - New	Each	4	\$ 500,000	\$ 2,000,000		
50.050 Communications	Lineal Miles of Guideway			\$ -		
CONSTRUCTION SUBTOTAL (10-50)				\$ 87,205,000	100%	58%
60 ROW, LAND, EXISTING IMPROVEMENTS				\$ 3,750,000		3%
60.010 Purchase or lease of real estate	Lineal Miles of Guideway			\$ -		
60.016 Unspecified	Lineal Miles of Guideway	15	\$ 250,000	\$ 3,750,000		
60.020 Relocation of existing households and businesses	Lineal Miles of Guideway			\$ -		
80 PROFESSIONAL SERVICES (10-50)				\$ 24,421,000		16%
80.010 Preliminary Engineering			4.0%	\$ 3,489,000		
80.020 Final Design			8.0%	\$ 6,977,000		
80.030 Project Management for Design and Construction			3.0%	\$ 2,617,000		
80.040 Construction Administration & Management			8.0%	\$ 6,977,000		
80.050 Professional Liability and other Non-Construction Insurance			0.0%	\$ -		
80.060 Legal; Permits; Review Fees by other agencies, cities, etc.			0.0%	\$ -		
80.070 Surveys, Testing, Investigation, Inspection			5.0%	\$ 4,361,000		
80.080 Start up			0.0%	\$ -		
SUBTOTAL (10-80)				\$ 115,376,000		77%
90 UNALLOCATED CONTINGENCY	Total Amount		30%	\$ 34,613,000		23%
SUBTOTAL (10-90)				\$ 149,989,000		100%
100 FINANCE CHARGES	Total Amount					0%
TOTAL PROJECT COSTS (10-100)				\$ 149,989,000		100%

Table 8-2: Order of Magnitude Estimate for Improvements Required to Support a Maximum Operating Speed of 79 MPH

MAIN WORKSHEET			Issue Date 5/4/16			
Grantee Name: Indiana Department of Transportation			Today's Date		10/31/19	
Project Name and Location: Hoosier State CSX Track Upgrade (MP QSC 0.0 - MP 00Q 25.7)			Yr of Base Year \$		2019	
Current Phase : Order of Magnitude Estimate			Yr of Revenue Ops		2024	

STANDARD COST CATEGORY	UNITS	QUANTITY	UNIT PRICE	BASE YEAR DOLLARS		
				TOTAL	PERCENTAGE OF CONSTRUCTION COSTS	PERCENTAGE OF TOTAL PROJECT COSTS
10 GUIDEWAY & TRACK ELEMENTS				\$ 189,560,000	60%	36%
10.010 Guideway: At-grade exclusive right-of-way	Lineal Miles of Guideway			\$ -		
10.020 Guideway: At-grade semi-exclusive (allows cross-traffic)	Lineal Miles of Guideway			\$ -		
10.030 Guideway: At-grade in mixed traffic	Lineal Miles of Guideway			\$ -		
10.040 Guideway: Aerial structure	Lineal Miles of Guideway			\$ -		
10.041 Bridges, Culverts, Drainage Improvements (Existing)	Square Feet of Structure	84000	\$ 550	\$ 46,200,000		
10.041 Bridges, Culverts, Drainage Improvements (New Sidings/Extensions)	Square Feet of Structure			\$ -		
10.050 Guideway: Built-up fill	Lineal Miles of Guideway			\$ -		
10.060 Guideway: Underground cut & cover	Lineal Miles of Guideway			\$ -		
10.080 Guideway: Retained cut or fill	Lineal Miles of Guideway			\$ -		
10.090 Track: Direct fixation	Track Miles			\$ -		
10.100 Track: Embedded	Track Miles			\$ -		
10.110 Track: Ballasted	Track Miles			\$ -		
10.111 Track: Ballasted, Rehabilitate (Mainline)	Track Miles	140	\$ 1,000,000	\$ 140,000,000		
10.112 Track: Ballasted (New Sidings/Extensions)	Track Miles			\$ -		
10.113 Track: Ballasted, Rehabilitate (Sidings)	Track Miles			\$ -		
10.114 Track: Ballasted, Curve Modification (Speed)	Track Miles	12	\$ 280,000	\$ 3,360,000		
10.115 Track: Ballasted, Industry Track Improvements/Adjustments (FTI)	Each			\$ -		
10.120 Track: Special (higher speed switches, turnouts)	Each			\$ -		
10.121 Track: Special (switches, turnouts)	Each			\$ -		
10.130 Track: Vibration and noise dampening	Track Miles			\$ -		
10.140 Special Structures	Lineal Miles of Guideway			\$ -		
				\$ -		
20 STATIONS, STOPS, TERMINALS, INTERMODAL				\$ -	0%	0%
				\$ -		
30 SUPPORT FACILITIES				\$ -	0%	0%
				\$ -		
40 SITEWORK & SPECIAL CONDITIONS				\$ 4,400,000	1%	1%
40.010 Demolition, Clearing, Earthwork	Lineal Miles of Guideway			\$ -		
40.020 Site Utilities, Utility Relocation	Lineal Miles of Guideway			\$ -		
40.030 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments	Lineal Miles of Guideway			\$ -		
40.040 Environmental mitigation, e.g. wetlands, historic/archeologic, parks	Lineal Miles of Guideway			\$ -		
40.050 Site structures including retaining walls, sound walls, fencing	Lineal Miles of Guideway			\$ -		
40.060 Pedestrian / bike access and accommodation, landscaping	Lineal Miles of Guideway			\$ -		
40.070 Automobile, bus, van accessways including roads, parking lots				\$ -		
40.071 Road Closures	Each			\$ -		
40.072 Grade Crossings	Each	88	\$ 50,000	\$ 4,400,000		
40.073 Grade Separations	Each			\$ -		
40.080 Temporary Facilities and other indirect costs during construction	Lineal Miles of Guideway			\$ -		
				\$ -		
50 SYSTEMS				\$ 122,550,000	39%	23%
50.010 Train control and signals	Track Miles	154	\$ 575,000	\$ 88,550,000		
50.020 Traffic signals and crossing protection	Each			\$ -		
50.021 CWT gate system - Existing	Each	40	\$ 250,000	\$ 10,000,000		
50.022 CWT gate system - New	Each	48	\$ 500,000	\$ 24,000,000		
50.050 Communications	Lineal Miles of Guideway			\$ -		
				\$ -		
CONSTRUCTION SUBTOTAL (10-50)				\$ 316,510,000	100%	60%
60 ROW, LAND, EXISTING IMPROVEMENTS				\$ -		0%
60.010 Purchase or lease of real estate	Lineal Miles of Guideway			\$ -		
60.016 Unspecified	Lineal Miles of Guideway			\$ -		
60.020 Relocation of existing households and businesses	Lineal Miles of Guideway			\$ -		
				\$ -		
80 PROFESSIONAL SERVICES (10-50)				\$ 88,625,000		17%
80.010 Preliminary Engineering			4.0%	\$ 12,661,000		
80.020 Final Design			8.0%	\$ 25,321,000		
80.030 Project Management for Design and Construction			3.0%	\$ 9,496,000		
80.040 Construction Administration & Management			8.0%	\$ 25,321,000		
80.050 Professional Liability and other Non-Construction Insurance			0.0%	\$ -		
80.060 Legal; Permits; Review Fees by other agencies, cities, etc.			0.0%	\$ -		
80.070 Surveys, Testing, Investigation, Inspection			5.0%	\$ 15,826,000		
80.080 Start up			0.0%	\$ -		
SUBTOTAL (10-80)				\$ 405,135,000		77%
90 UNALLOCATED CONTINGENCY	Total Amount		30%	\$ 121,541,000		23%
SUBTOTAL (10-90)				\$ 526,676,000		100%
100 FINANCE CHARGES	Total Amount					0%
TOTAL PROJECT COSTS (10-100)				\$ 526,676,000		100%

8. Next Steps

The following assumptions have been made to simplify the analysis required for the Plan:

1. It is recommended that further evaluation include detailed coordination and the necessary agreements with the freight railroad(s) to confirm feasibility, scope, and cost of the proposed improvements.
2. The impacts of proposed cross-platform interchange at Dyer shall be carefully evaluated and coordinated with NICTD. The proposed West Lake Corridor – Dyer Station plans may need to be modified to accommodate track infrastructure proposed for the Hoosier State.
3. The location of potential new sidings and/or siding extensions shall be further refined based on a more detailed and constrained model.

9. Existing CSXT Infrastructure

History

As noted earlier, this Plan focuses on improvements located within the State of Indiana only. The existing Corridor between Munster and Indianapolis is comprised of three (3) railroad subdivisions (Monon Subdivision, Crawfordsville Branch Subdivision, and Indianapolis Terminal Subdivision – Crawfordsville Branch) owned and operated by CSXT. The Monon Subdivision, named after a CSXT predecessor, the Chicago, Indianapolis, and Louisville Railway, extends from Munster Junction (MP 00Q 25.7) to Ames (MP 00Q 148.2) in Crawfordsville, Indiana. In Crawfordsville, the Corridor diverges onto the Crawfordsville Branch Subdivision, originally constructed in 1869 by the Indianapolis Bloomington & Western Railroad, extending from Ames (MP QSC 46.1) to CP Clermont (MP QSC 12.6). At CP Clermont (MP QSC 12.6) the Corridor connects with the Indianapolis Terminal Subdivision - Crawfordsville Branch, to Union Station (MP QSC 0.7).

Right-of-Way

Based on review of various county GIS data, the existing right-of-way width along the Corridor varies by location. Table 9 summaries right-of-way widths for segments of the Corridor in various counties, in order from Munster to Indianapolis.

Table 9 – Existing Railroad Right-of-Way

County	CSX Milepost		General Railroad R/W	Exceptions/Notes
Lake	00Q 25.7	00Q 53.4	50' to 100'	35' in Cedar Lake
Newton	00Q 53.4	00Q 60.1	80'-100'	66' in Roselawn
Jasper	00Q 60.1	00Q 82.0	50' to 100'	
White	00Q 82.0	00Q 109.1	70'-100'	35' in Reynolds
Tippecanoe	00Q 109.1	00Q 135.5	70'-100'	R/W Unknown At Battle Ground
Montgomery	00Q 135.5	QSC 34.7	60'-80'	31' in Linden
Boone	QSC 34.7	QSC 30.0	60'-100'	33' in Jamestown
Hendricks	QSC 30.0	QSC 13.2	60'-70'	
Marion	QSC 13.2	QSC 0.7	100'-200'	Various locations at 50'

Mainline Track

Within the limits of the Corridor, the CSXT Monon Subdivision consists of a single mainline track with nine (9) passing sidings and two (2) storage tracks. The maximum authorized train speed is 60/40 mph (passenger/freight). The CSXT Crawfordsville Branch Subdivision consists of a single mainline track with one (1) passing siding and one (1) storage track. The maximum authorized train speed is 59/49 mph (passenger/freight). The CSXT Indianapolis Terminal – Crawfordsville Branch Subdivision consists of a single mainline track with a running track located just east of the Indianapolis International Airport. The maximum authorized train speed is 60/30 mph (passenger/freight).

Table 10 – Authorized Speeds

Subdivision	CSX Milepost		Passenger	Freight
Monon	00Q 25.7	00Q 25.8	25	25
Monon	00Q 25.8	00Q 28.8	50	40
Monon	00Q 28.8	00Q 29.2	40	40
Monon	00Q 29.2	00Q 33.2	60	40
Monon	00Q 33.2	00Q 33.6	40	40
Monon	00Q 33.6	00Q 43.3	60	40
Monon	00Q 43.3	00Q 45.1	50	30
Monon	00Q 45.1	00Q 73.0	60	40
Monon	00Q 73.0	00Q 73.2	50	40
Monon	00Q 73.2	00Q 88.3	60	40
Monon	00Q 88.3	00Q 88.5	15	15
Monon	00Q 88.5	00Q 95.7	60	40
Monon	00Q 95.7	00Q 96.4	50	35
Monon	00Q 96.4	00Q 106.0	60	40
Monon	00Q 106.0	00Q 106.5	40	40
Monon	00Q 106.5	00Q 107.6	45	40
Monon	00Q 107.6	00Q 112.6	60	40
Monon	00Q 112.6*	00Q 113.3*	45	40
Monon	00Q 113.3	00Q 117.0	60	40
Monon	00Q 117.0	00Q 119.3	20	20
Monon	00Q 119.3	00Q 120.7	40	40
Monon	00Q 120.7	00Q 125.4	50	40
Monon	00Q 125.4	00Q 126.4	40	40
Monon	00Q 126.4	00Q 145.3	60	40
Monon	00Q 145.3	00Q 147.2	40	40
Crawfordsville	QSC 46.2	QSC 46.1	10	10
Crawfordsville	QSC 46.1	QSC 45.2	40	40
Crawfordsville	QSC 45.2	QSC 31.0	59	49
Crawfordsville	QSC 31.0*	QSC 30.0*	49	49
Crawfordsville	QSC 30.0	QSC 13.4	59	49
IT-Crawfordsville	QSC 13.4	QSC 13.1	40	40
IT-Crawfordsville	QSC 13.1	QSC 12.6	30	30
IT-Crawfordsville	QSC 12.6	QSC 12.5	30	30
IT-Crawfordsville	QSC 12.5	QSC 8.6	60	30
IT-Crawfordsville	QSC 8.6	QSC 8.1	40	30
IT-Crawfordsville	QSC 8.1	QSC 7.4	49	30
IT-Crawfordsville	QSC 7.4	QSC 6.8	40	30

Subdivision	CSX Milepost		Passenger	Freight
IT-Crawfordsville	QSC 6.8	QSC 5.3	60	30
IT-Crawfordsville	QSC 5.3	QSC 4.6	40	30
IT-Crawfordsville	QSC 4.6	QSC 2.3	60	30
IT-Crawfordsville	QSC 2.3	QSC 0.7	40	30

*Local ordinances in effect for train speed in Battle Ground and Jamestown.

Table 11 – Existing Sidings

CSX Milepost		Siding Name	Length (ft.)	Type
00Q 29.2	00Q 30.4	Dyer	5,200	
00Q 48.1	00Q 50.4	Shelby	10,965	Controlled Siding
00Q 56.5	00Q 57.7	Roselawn	4,495	
00Q 67.1	00Q 68.1	Surrey	4,330	
00Q 73.0	00Q 73.8	Rensselaer		Storage Track
00Q 86.2	00Q 87.3	West Pass	9,335	
00Q 96.1	00Q 97.5	Reynolds		Storage Track
00Q 105.1	00Q 106.1	Brookston	5,304	
00Q 121.4	00Q 122.3	Lafayette Junction	4,011	
00Q 127.5	00Q 129.5	South Raub	10,500	Controlled Siding
00Q 135.6	00Q 136.8	Linden	6,795	
QSC 46.0	QSC 44.9	East Storage Track		Storage Track
QSC 29.6	QSC 26.5	Jamestown	15,800	Controlled Siding
QSC 5.1	QSC 3.5	Kraft Runner West	16,300	Running Track

CSXT crosses CN (Wisconsin Central) at-grade at MP 00Q 29.1, 0.27 miles north of the US Highway 30 at-grade crossing. Northward and southward signals at the CN (WC) crossing are equipped with a 15 minute timeout circuit. Therefore, any train southward that consumes more than 15 minutes between northward absolute signal (NAS) at Munster (00Q 25.8) and 215th Street (00Q 28.5) can expect the southward absolute signal (SAS) at the CN (WC) crossing to display a Stop aspect. Similarly, any northward train that consumes more than 15 minutes between 00Q 33.3 and the NAS at 00Q 29.4 (US Highway 30) can expect the NAS at the CN (WC) crossing to display a Stop aspect. Historically, significant delays have occurred at this location due to freight train interference (FTI). Based on USDOT Crossing Inventory data for nearby at-grade roadway crossings, CN (WC) currently runs 15 trains per day through this railroad crossing at-grade.

CSXT crosses Norfolk Southern (NS) at-grade at MP 00Q 33.3, 0.08 miles north of the W. 93rd Street at-grade crossing. Northward and southward signals at the NS crossing are equipped with an 8 minute timeout circuit. A southward train that consumes more than 8 minutes between NAS at Dyer (00Q 29.3) and the SAS at St. John (00Q 33.3) can expect the SAS at the NS crossing to display a Stop aspect. Similarly, any northward train that consumes more than 8 minutes between 00Q 36.8 and the NAS at St. John (00Q 33.3) can expect the NAS at the NS crossing to display a Stop aspect. Historically, significant delays have occurred at this location due to signal issues (DCS).

Furthermore, CSXT crosses NS at-grade at MP 00Q 52.6, 0.01 miles north of the 235th Avenue at-grade crossing. Northward and southward signals at the NS crossing are equipped with a 15 minute timeout circuit. A southward train that consumes more than 15 minutes between 00Q 48.1 and the SAS at Shelby (00Q 52.6) can expect the SAS at the NS crossing to display a Stop aspect. Similarly, any northward train that consumes more than 15 minutes between 00Q 57.2 and the NAS at Shelby (00Q 52.6) can expect the NAS at the NS crossing to display a Stop aspect. Historically, delays at this location have been attributed to slow orders (DSR). These slow orders were likely due to existing conditions at the NS diamond. It shall be noted that improvements may have occurred at this location, as the current maximum authorized speed through this location is 60 mph for passenger trains, whereas it was previously 40 mph.

Freight and passenger trains diverge south at the Monon Interchange (00Q 88.4), by traversing two (2) No. 8 turnouts and a 9°30'± horizontal curve. Given the sharp frog angle and degree of curvature, the maximum authorized speed (for both freight and passenger trains) is restricted to 15 mph.

The Toledo, Peoria & Western Railway (TPWR) crosses CSXT at-grade at MP 00Q 95.9, 0.03 miles north of the Logan Street at-grade crossing, passenger and freight train speeds are restricted to 50 mph and 35 mph, respectively. A single track junction is located in the southwest quadrant of the CSXT and TPWR at-grade crossing.

Between MP 00Q 106 and MP 00Q 107.6 passenger train speeds are restricted between 40-45 mph. A 0°30' left hand curve is located near MP 00Q 107.3; however, there are no apparent geometric deficiencies that warrant said speed restriction.

Between MP 00Q 112.6 and MP 00Q 113.3 passenger train speeds are restricted to 45 mph. This speed restriction is due to a local ordinance by the Town of Battle Field.

Between MP 00Q 117.0 and MP 00Q 119.6 passenger trains pass through the CSXT Lafayette Yard. The main track passes through the middle of the yard. Historically, delays have occurred at this location due to freight train interference, as current yard/switching operations may occupy the main track. Passenger trains may be required to wait until switching moves have cleared the main track to proceed.

Between MP 00Q 135.6 and MP 00Q 136.8 is Linden Siding. At the south end of the siding is the turnout for the industry track that serves a renewable fuel production facility. This location has historically been a significant cause of delay due to FTI. The existing industry lead is aligned with the existing siding turnout; therefore, when CSXT freight trains switch the facility, they must occupy both the main track and the siding to pull and spot cars within the facility.

At MP 00Q 148.2 / MP QSC 46.1 in Crawfordsville, passenger trains switch between the Monon and Crawfordsville Branch Subdivisions at a location referred to as 'Ames'. Historically, this location has been the single largest cause of total delay due to FTI. The segment of track from Crawfordsville to CP Clermont consists of a single, un-signalized track, which is operated over using track warrants. In 2018, CSXT constructed a new controlled passing siding at Jamestown, which has reduced overall delays along this segment.

Between MP QSC 30.0 and MP QSC 31.0 passenger train speeds are restricted to 49 mph. This speed restriction is based on a local ordinance for the Town of Jamestown.

Between MP QSC 8.6 and MP QSC 9.5 are Controlled Points (CP North Hunt, CP South Hunt), which control train movements to and from the CSXT Indianapolis Terminal Subdivision, and trains arriving at and departing Avon Yard. This location has historically been a significant cause of delay due to freight train interference, due to this portion of the segment being single track, with no way to get around interfering trains until they have cleared the main track or have moved a sufficient distance down the main track to safely allow following movements.

Industry Sidetracks

There are several railroad-served industries within the Corridor. A complete list of all existing industry sidetracks is included in Table 12 below. There are thirty-nine (39) industry sidetracks present within the limits. Of these sidetracks, it is estimated that twenty-five (25) are currently active, and receive regular or semi-regular rail service. Based on historic aerial imagery, the remaining sidetracks are assumed to be inactive; and range from house tracks, to closed industries, to other industries that appear to not have received any recent rail service.

Table 12 – Industry Sidetracks

CSX Milepost	Name	Active/Inactive
00Q 25.9	General Electric	Active
00Q 32.8	Schilling Brothers Sdg	Active
00Q 56.5	Ceres Solutions	Inactive
00Q 66.5	SE Parr Elevator	Active
00Q 73.1	Vision Ag Inc.	Inactive
00Q 73.7	National Gypsum Co.	Active
00Q 73.7	Rensselaer Plastics Co.	Active
00Q 76.9	SE Air Line #1	Inactive
00Q 77.1	Ceres Solutions	Active
00Q 77.9	Iroquois Bio Energy	Active
00Q 87.3	Ag Facility	Inactive
00Q 95.4	Magnetation Pellet Plant	Inactive
00Q 95.5	Excel Co-Op	Inactive
00Q 96.6	Co-Alliance Reynolds Feed	Inactive
00Q 101.8	Chalmers House Track	Inactive
00Q 105.0	Con-Agra Foods	Active
00Q 105.8	ADM	Active
00Q 121.6	Cargill	Active
00Q 122.6	Eli Lilly	Active
00Q 123.8	Chemrock	Inactive
00Q 132.5	Romney Co-Op	Inactive
00Q 132.7	Anderson's Fertilizer	Inactive
00Q 136.9	Valero Renewable Fuels	Active
00Q 139.4	Clifton Quigg	Inactive
00Q 142.1	Cherry Grove ADM	Inactive

CSX Milepost	Name	Active/Inactive
00Q 145.2	Grefco	Active
00Q 145.2	Closure System	Active
00Q 147.3	Crawfordsville House Track	Inactive
QSC 45.9	Central Salt	Active
QSC 45.9	Industry Lead	Active
QSC 45.9	Closure Systems International	Inactive
QSC 41.5	Nucor Steel	Active
QSC 21.9	Steel Dynamics	Active
QSC 18.7	Contrack Lumber	Active
QSC 10.1	MainGate, Inc.	Active
QSC 8.5	Quemetco, Inc.	Active
QSC 7.6	Industry Lead	Active
QSC 3.7	Stout Field Industry Track	Active
QSC 3.4	Petersburg Industry Track	Active
QSC 1.7	Belmont Warehousing	Active

Yards

Within the Corridor there are four (4) existing rail yards. The yards are summarized as follows:

South Monon Yard MP 00Q 88.5 to MP 00Q 88.9, Monon

South Monon Yard is an existing 2-track, double-ended yard located along the west side of the CSXT Monon Subdivision mainline in Monon. This yard appears to support local freight train operations, acting as location to set out and pick up railcars for local industries.

Lafayette Yard MP 00Q 117.0 to MP 00Q 119.6, Lafayette

Lafayette Yard is an existing 17-track yard along the CSXT Monon Subdivision which supports several large industries in the Lafayette area. In addition, said yard also supports interchange of railcar traffic with the Norfolk Southern and Kankakee, Beaverville & Southern Railroad. The existing Monon Subdivision mainline track runs through the middle of the yard.

Avon Yard MP QSC 8.6 to MP QSC 9.5, Avon

Avon Yard is a major classification yard located along the CSXT Indianapolis Terminal Subdivision, west of the study limits. Connections to this yard are made along the CSXT Indianapolis Terminal – Crawfordsville Branch Subdivision at MP QSC 8.6 - South Hunt and MP QSC 9.5 - North Hunt (within study limits). This yard is used primarily to classify inbound railcars, and assemble outbound trains.

Transfer Yard MP QSC 1.8 to MP QSC 2.9, Indianapolis

Transfer Yard is an existing double-ended ten (10) track yard located along the south side of the CSXT Indianapolis Terminal Subdivision – Crawfordsville Branch, just west of downtown Indianapolis. Based on review of historic aerial imagery and street level imagery, it appears that this yard may be lightly used.

Railroad Bridge Structures

There are 78 railroad structures over roads and/or waterways within the Corridor. They are summarized in Table 13 below by location, type, and overall length.

Table 13 – Railroad Bridges

CSX Milepost	Name	Structure Type	Length
00Q 29.04	Hart Ditch	BD Single Track	98'
00Q 35.41	US 231	BD Single Track	44'
00Q 38.45	Cedar Lake Road	DPG Single Track	44'
00Q 39.07	Unnamed Stream	Arch Single Track	16'
00Q 45.61	Cedar Creek	BD Single Track	80'
00Q 48.23	Griesel Ditch	BD Double Track	70'
00Q 49.31	Singleton Ditch	BD & DPG Double Track	70'
00Q 50.43	Brown Ditch	BD Single Track	68'
00Q 51.55	Tulley Ditch	DPG Single Track	30'
00Q 53.34	Kankakee River	DPG Single Track	254'
00Q 59.94	Boyle Ditch (Moffitt Ditch)	BD Single Track	36'
00Q 65.10	Little Iroquois	BD Single Track	38'
00Q 74.29	Iroquois River	DPG Single Track	104'
00Q 80.37	Slough Creek/Ringeisen Ditch	DPG Single Track	28'
00Q 81.23	Slough Creek/Jordan Ditch	DPG Single Track	30'
00Q 88.49	Monon Creek (McKillip Ditch)	DPG Single Track	72'
00Q 91.33	Hoagi Ditch (Hoagland Ditch)	DPG Single Track	74'
00Q 93.48	Honey Creek	BD Single Track	40'
00Q 95.01	Fraser Ditch	BD Single Track	44'
00Q 97.93	Dieter Ditch	DPG Single Track	34'
00Q 99.34	Big Creek	BD Single Track	70'
00Q 103.93	Carr's Ditch (Spring Creek)	BD Single Track	32'
00Q 106.89	Moots Creek	DPG Single Track	66'
00Q 115.77	Wabash River	Span Truss with DPG Single Track	670'
00Q 117.85	Widewater	BD Double Track	160'
00Q 118.92	N. 9 th Street	TPG Double Track Through Yard	122'
00Q 120.39	Wabash Avenue	TPG 4-Track	100'
00Q 122.32	US 231	TPG Single Track	174'
00Q 123.53	SR 25	BD Single Track	62'
00Q 124.22	Big Wea River	BD Single Track	150'
00Q 125.47	Little Wea River	BD Single Track	120'
00Q 125.95	Little Wea River	BD Single Track	54'
00Q 126.24	Little Wea River	BD Single Track	34'
00Q 127.16	Unnamed Stream	BD Single Track	38'
00Q 127.35	Unnamed Stream	BD Single Track	36'

CSX Milepost	Name	Structure Type	Length
00Q 129.04	Little Wea Creek	Arch Double Track	80'
00Q 129.55	Unnamed Stream	Arch Double Track	50'
00Q 131.68	Haywood Ditch	BD Single Track	32'
00Q 133.68	Lofland Ditch	DPG Single Track	34'
00Q 142.42	Black Creek	BD Single Track	40'
00Q 143.38	Unnamed Stream	Arch Single Track	16'
00Q 145.91	Unnamed Stream	Arch Single Track	16'
00Q 146.44	Sugar Creek	DPG Single Track	330'
QSC 42.38	Unnamed Stream	Arch Single Track	12'
QSC 42.15	Unnamed Stream	Arch Single Track	12'
QSC 41.85	Unnamed Stream	Arch Single Track	12'
QSC 34.69	Raccoon Creek	DPG Single Track	60'
QSC 29.84	Eel River (Big Walnut Creek)	DPG Single Track	70'
QSC 28.45	Big Walnut Creek	Arch Double Track	24'
QSC 24.96	Ross Ditch	BD Single Track	34'
QSC 19.34	White Lick Creek	Arch Single Track	30'
QSC 17.52	White Lick Creek	DPG Single Track	212'
QSC 15.39	Quinn Ditch	Arch Single Track	20'
QSC 12.54	Branch Line Pvt	Arch Single Track	12'
QSC 12.39	Robey Branch	Arch Single Track	20'
QSC 12.09	Country Club Road	BD Single Track	50'
QSC 11.97	Mario Creek	Arch Single Track	20'
QSC 11.59	B&O RR	Steel Truss Single Track	126'
QSC 11.54	West 21 st Street	BD Single Track	56'
QSC 10.52	Tenth Street	BD Single Track	44'
QSC 9.50	Rockville Road	BD Single Track	122'
QSC 9.24	St. Louis Sub	Steel Truss Single Track	160'
QSC 8.49	Morris Road	Arch Single Track	44'
QSC 8.35	Julia Creek	Arch Single Track	20'
QSC 8.20	Cattle Crossing	Arch Single Track	14'
QSC 8.05	Thompson Ditch	Arch Single Track	12'
QSC 7.61	Washington Street	TPG Single Track	150'
QSC 4.44	Morris Street	Arch Double Track	38'
QSC 3.11	Tibbs Avenue	Arch Three Track	38'
QSC 2.94	Eagle Creek	BD Three Track	260'
QSC 2.52	Warman Avenue	BD Four Track	60'
QSC 0.83	S. White River Parkway Drive	BD Double Track	50'
QSC 0.80	White River	DPG Double Track	620'
QSC 0.42	S. West Street	TPG Double Track	80'
QSC 0.30	S. Missouri Street	TPG Double Track	120'

CSX Milepost	Name	Structure Type	Length
QSC 0.20	Dean Phillips Drive	Viaduct	100'
QSC 0.08	Capitol Avenue	Viaduct	90'
QSC 0.01	Illinois Street	Viaduct	160'

Overhead Bridge

There are 19 overhead roadway bridges within the Corridor. They are summarized in Table 14 below by location and type.

Table 14 – Overhead Bridges

CSX Milepost	Crossing ID	Name	Structure Type
00Q 32.86	341146J	Wicker Avenue	Roadway Bridge
00Q 60.96	341200A	I-65	Roadway Bridge
00Q 114.62	341302T	I-65	Dual Roadway Bridges
00Q 117.73	341311S	52S/Sagamore Pkwy	Dual Roadway Bridges
00Q 119.56	960959E	Salem Street	Roadway Bridge
00Q 119.57	960960Y	Union Street	Roadway Bridge
00Q 119.58	960961F	3 rd Street Ramp	Roadway Bridge
00Q 120.03	937883T	Riehle Plaza Bridge	Pedestrian Bridge
00Q 120.60	960966P	Walkway	Pedestrian Bridge
00Q 120.10	937736F	Columbia Street	Roadway Bridge
00Q 120.10	937737M	South Street	Roadway Bridge
00Q 123.37	341350H	Shadeland Avenue	Roadway Bridge
00Q 139.07	341377S	US 231	Roadway Bridge
00Q 144.92	341392U	I-74	Dual Roadway Bridges
00Q 147.95	341407G	Wabash Avenue	Roadway Bridge
QSC 14.20	937955U	Ronald Reagan Parkway	Roadway Bridge
QSC 6.09	539051D	High School Road	Roadway Bridge
QSC 5.78	539050W	I-465	Roadway Bridge
QSC 3.62	539044T	Holt Avenue	Roadway Bridge

Railroad-Highway At-Grade Crossings

There are 237 existing at-grade crossing within the study limits. A complete list of all existing at-grade crossings is included in Appendix B. There are 138 crossings equipped with active warning devices, which are further described by the type of train detection present. All existing active warning devices are either Constant Warning Time (CWT) or Motion Detection (MOTION). There are 99 existing at-grade crossings with passive warning devices (e.g. crossbucks, stop sign, etc.), including 43 public and 56 private crossing locations. The crossing surface type for each location is also listed. The majority of crossings have an asphalt with timber flange way crossing surface (CSXT Standard), with the exception of a small number of crossings with full-depth rubber or concrete surfaces. Warning system and crossing surface types were determined from USDOT Crossing Inventory Forms for each crossing location. When crossing surface

information was incomplete on the USDOT Form, historic aerial imagery was used to determine surface type.

Signal and Communications Systems

As previously mentioned in this Plan, train movements on the Monon and Crawfordsville Branch Subdivisions require significant radio-based communications between train crews and dispatchers/yard masters. Authorities are provided verbally via radio by the CSXT train dispatcher, written down by the train crew, and repeated to the dispatcher before any movement can occur. Train movements within the Indianapolis Terminal – Crawfordsville Branch Subdivision are governed by Traffic Control (TC), a signal system under which opposing and following train movements are authorized and governed by block signals.

Within the limits of Lafayette Yard, train movements are governed by Yard Limits (YL) operating rules. Trains must obtain verbal authority via radio from CSXT train dispatching or the employee responsible for yard operations, known as the yard master. Similar to TWC, these authorities are written down by the train crew and repeated back before any movement can occur. Table 15 below lists the train control methods by location within the Corridor.

Table 15 – Train Control Methods

CSX Milepost		Train Control
00Q 25.7	00Q 48.1	Track Warrant Control (TWC)
00Q 48.1	00Q 50.4	Traffic Control (TC)
00Q 50.4	00Q 95.1	Track Warrant Control (TWC)
00Q 95.1	00Q 95.9	Traffic Control (TC)
00Q 95.9	00Q 115.5	Track Warrant Control (TWC)
00Q 115.5	00Q 118.8	Yard Limits (YL)
00Q 118.8	00Q 119.4	Traffic Control (TC)
00Q 119.4	00Q 120.5	Traffic Control (TC)
00Q 120.5	00Q 148.2	Track Warrant Control (TWC)
QSC 46.1	QSC 12.6	Track Warrant Control (TWC)
QSC 12.6	QSC 9.6	Traffic Control (TC)
QSC 9.6	QSC 8.6	Traffic Control (TC)
QSC 8.6	QSC 3.5	Traffic Control (TC)
QSC 3.5	QSC 1.6	Traffic Control (TC)
QSC 1.6	QSC 0.7	Traffic Control (TC)

There are several locations within the corridor, including junctions and sidings, which are referred to as Controlled Points (CP). Controlled Points are locations where the signals and/or switches of a traffic control system are operated and/or controlled from a distant location.

Automatic Block Signals (ABS) are also located within the Monon Subdivision. This railroad communication system consists of a series of signals that divide the rail line into a series of sections or “blocks”. The system controls the movement of trains between the blocks by using automatic signals, which allow trains running in the same direction to follow in a safe manner, without risk of a rear-end

collision. The automatic operation comes from the system's ability to detect whether blocks are occupied or otherwise obstructed, and to convey that information (via wayside signal) to approaching trains. Table 16 below lists the approximate locations of wayside signals along the Corridor.

Table 16 – Railroad Wayside Signal Locations

CSX Milepost	Description
00Q 25.7	Munster Junction
00Q 27.4	Block Signal
00Q 29.1	CN Diamond
00Q 30.4	Block Signal
00Q 32.3	Block Signal
00Q 33.3	NS Diamond
00Q 36.8	Block Signal
00Q 39.5	Block Signal
00Q 42.0	Block Signal
00Q 45.1	Block Signal
00Q 48.1	Controlled Point - NE Shelby Siding
00Q 50.4	Controlled Point - SE Shelby Siding
00Q 52.6	NS Diamond
00Q 56.5	Block Signal - NE Roselawn Siding
00Q 57.7	Block Signal - SE Roselawn Siding
00Q 60.1	Block Signal
00Q 64.0	Block Signal
00Q 67.1	Block Signal - NE Surrey Siding
00Q 68.1	Block Signal - SE Surrey Siding
00Q 70.1	Block Signal
00Q 72.6	Block Signal
00Q 77.1	Block Signal - NE Pocket Track
00Q 77.8	Block Signal - SE Pocket Track
00Q 80.6	Block Signal
00Q 83.3	Block Signal
00Q 86.2	Block Signal - NE West Pass Siding
00Q 91.0	Block Signal
00Q 93.9	Block Signal
00Q 95.1	Controlled Point (Former Pellet Plant)
00Q 95.9	TPW Diamond
00Q 97.5	Block Signal - SE Reynolds Pass Siding
00Q 102.2	Block Signal
00Q 105.1	Block Signal - NE Brookston Siding
00Q 106.1	Block Signal - SE Brookston Siding
00Q 107.5	Block Signal
00Q 109.6	Block Signal

CSX Milepost	Description
00Q 110.5	Block Signal
00Q 115.5	Block Signal
00Q 117.7	Block Signal
00Q 118.8	Controlled Point – 9 th Street
00Q 119.4	Controlled Point - Salem Street
00Q 120.5	Controlled Point - Lafayette Junction (NS Control)
00Q 122.3	Block Signal SE Lafayette Junction Siding
00Q 125.1	Block Signal
00Q 127.5	Controlled Point - NE South Raub Siding
00Q 129.5	Controlled Point - SE South Raub Siding
00Q 133.0	Block Signal
00Q 135.6	Block Signal - NE Linden Siding
00Q 136.8	Block Signal - SE Linden Siding
00Q 137.9	Block Signal
00Q 140.9	Block Signal
00Q 143.6	Block Signal
00Q 148.2	Controlled Point - Ames
QSC 45.2	Approach (CP Ames)
QSC 31.9	Approach (WE Jamestown Siding)
QSC 29.6	Controlled Point - WE Jamestown Siding
QSC 26.5	Controlled Point - EE Jamestown Siding
QSC 24.2	Approach (EE Jamestown Siding)
QSC 14.0	Approach (CP Clermont)
QSC 12.6	Controlled Point - Clermont
QSC 9.5	Controlled Point - North Hunt
QSC 8.6	Controlled Point - South Hunt
QSC 6.8	WE Kraft Runner West TO
QSC 3.5	Controlled Point - Holt
QSC 1.6	Controlled Point - Woods
QSC 0.7	Controlled Point - IJ

10. Existing Train Operations

Existing train operations within the Corridor were reviewed, based on current USDOT Crossing Inventory data. Table 17 below summarizes average daily train counts within four (4) segments along the corridor. It is shown that train counts vary between these segments.

Table 17 – Existing Average Daily Train Operations within Corridor

Segment	Day Through	Night Through	Switching	Total
Munster Jct. - Lafayette Yard	2	2	2	6
Lafayette Yard - Crawfordsville	6	3	3	12
Crawfordsville - Clermont	4	2	2	8
Clermont - Indianapolis Union Sta.	4	3	4	11

The segment between Clermont and Indianapolis Union Station has connections to other CSXT lines, including the Frankfort Secondary, the Indianapolis Terminal, and the IT Indianapolis Belt Subdivisions.

The segment between Crawfordsville and Clermont includes traffic to/from Chicago and Lafayette, as well as local traffic to serve industries along the segment. It is noted that there are two large steel producing facilities along this segment of track.

The segment between Lafayette and Crawfordsville includes traffic to/from Chicago and Lafayette, as well as local traffic serving several industries along the line, including along the Monon Subdivision south of Crawfordsville, industrial track within Crawfordsville, a renewable energy plant in Linden, and several large industries in/around Lafayette.

The segment between Lafayette and Munster Junction includes traffic to/from Chicago, as well as local traffic to serve industries along the segment, including grain elevators/agricultural facilities, and a few small industries at Rensselaer, St. John, and Munster.

Based on review of the train count data for each segment, it appears that train counts are highest on the Lafayette-Crawfordsville segment due to local train operations to serve industries, and counts along the Clermont to Indianapolis Union Station segment include trains to/from other CSXT lines.

11. Definitions, Acronyms, and Abbreviations

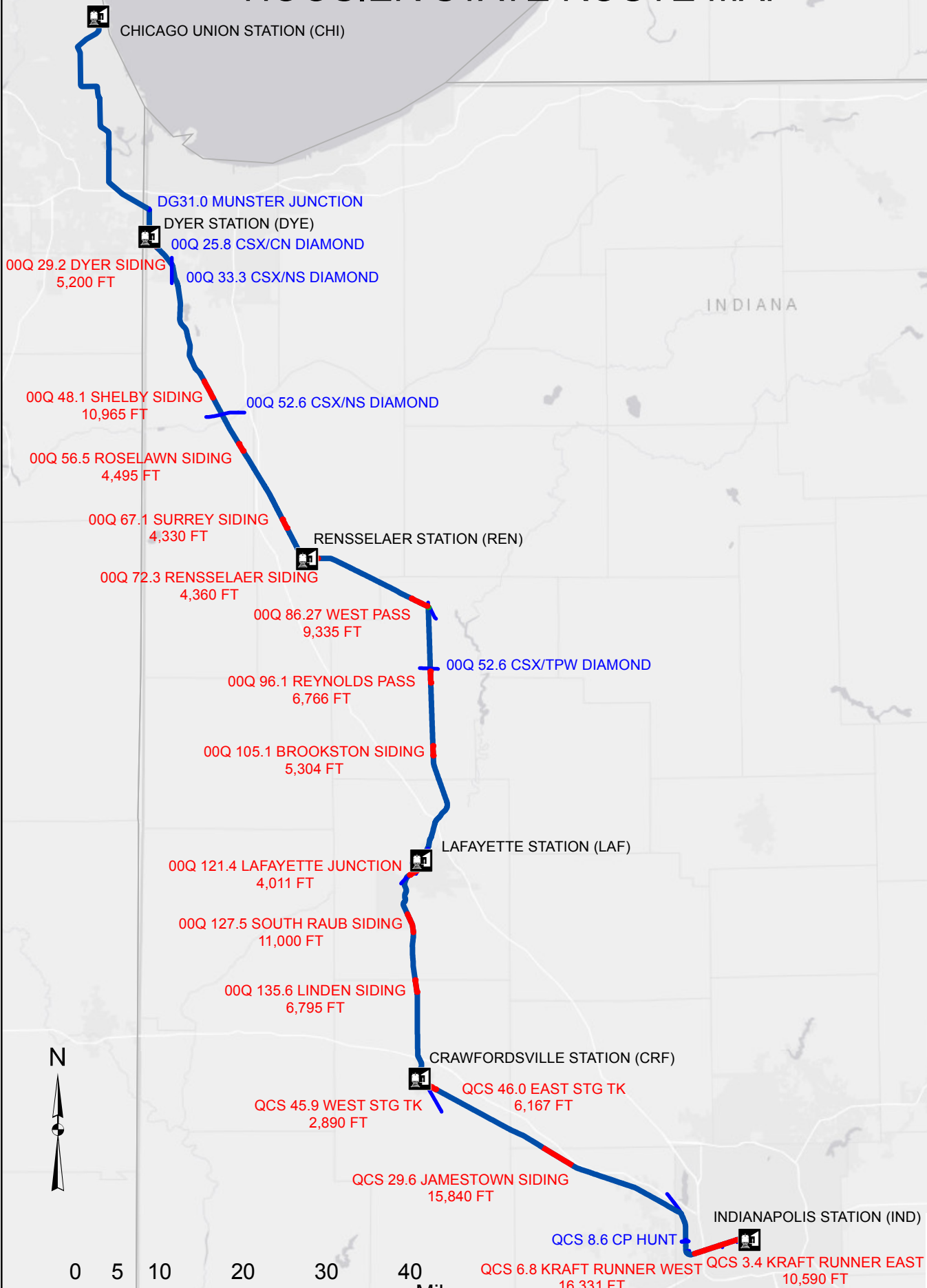
AADT	Annual Average Daily Traffic
AAR	Association of American Railroads
ADA	Passenger Related-Disabled Passenger
AREMA	American Railway Engineering and Maintenance-of-Way Association
CN	Canadian National Railway
CSXT	CSX Transportation
CTC	Centralized Traffic Control (CTC) a term applied to a system of railroad operation by means of which the movement of trains over routes and through blocks on a designated section of track or tracks directed by signals controlled from a designated section of track or tracks without requiring the use of train orders and without the superiority of trains.
CTI	Commuter Train Interference
CR	County Road
CWT	Constant Warning Time (CWT) is a system that has the capability of sensing a train as it approaches a crossing, measuring its speed and distance from the crossing, and activating the traffic control device (i.e. flashing lights and gates) to provide the desired warning time.
DSC	Signal Delays
DSR	Temporary Slow Order
DMW	Maintenance of Way Work
DTR	Detour
E	East
ENG	Engine Failure
FHWA	Federal Highway Administration
FTI	Freight Train Interference
FRA	Federal Railroad Administration
HLD	All other Passenger Related Delay
INDOT	Indiana Department of Transportation
ITI	Initial Terminal Delay Due to Late-Arriving Inbound Train
MP	Milepost
MPH	Miles per Hour
N	North

NB	Northbound
NICTD	Northern Indiana Commuter Transportation District
NOD	No Delay
PTC	Positive Train Control (PTC) is an advanced system design to automatically stop a train before certain accidents occur. In particular, PTC is designed to prevent: train-to-train collisions; derailments caused by excessive train speed; and train movements through misaligned track switches.
PTI	Passenger Train Interference
S	South
SB	Southbound
SR	State Route
SYS	System Delay
TCS	Traffic Control Signal System (TCS) a signal system under which opposing and following train movements are authorized and governed by block signals.
TPWR	Toledo, Peoria & Western Railway subsidiary of the Genesee & Wyoming Inc.
RTE	Routing Delay
W	West
WC	Wisconsin Central Ltd. is a subsidiary of the Canadian National Railway.
YL	Yard Limits (YL) a portion of main track designated by special instructions. Yard limits are identified by signs.

Appendix A

Existing Corridor Map

HOOSIER STATE ROUTE MAP



Appendix B

Railroad-Highway At-Grade Crossing Data

Appendix B: Railroad-Highway At-Grade Crossings

CSX Milepost	Crossing ID	Name	Warning Device	Surface Type
00Q 25.92	341134P	45TH STREET	ACTIVE-CWT	ASPHALT/TIMBER
00Q 27.69	341136D	SHEFFIELD AVENUE	ACTIVE-MOTION	ASPHALT/TIMBER
00Q 28.30	341137K	213TH ST	ACTIVE-CWT	ASPHALT/TIMBER
00Q 28.55	341138S	215TH ST	ACTIVE-MOTION	ASPHALT/TIMBER
00Q 28.88	341139Y	EDMOND	ACTIVE-CWT	ASPHALT/TIMBER
00Q 29.39	341140T	LINCOLN HWY/US 30	ACTIVE-CWT	CONCRETE
00Q 30.64	341141A	77TH STREET	ACTIVE-CWT	ASPHALT/TIMBER
00Q 31.36	341142G	81ST AVE	ACTIVE-MOTION	ASPHALT/TIMBER
00Q 31.65	341143N	PATTERSON AVE	ACTIVE-MOTION	ASPHALT/TIMBER
00Q 32.20	341145C	PRIVATE RD	PASSIVE	ASPHALT/TIMBER
00Q 33.33	341147R	W 93RD AVE	ACTIVE-CWT	ASPHALT/TIMBER
00Q 33.48	341148X	THIELEN ST	ACTIVE-CWT	ASPHALT/TIMBER
00Q 33.81	341149E	JOLIET ST	ACTIVE-CWT	ASPHALT/TIMBER
00Q 34.49	341150Y	PRIVATE RD	PASSIVE	TIMBER
00Q 34.86	341152M	PRIVATE RD	PASSIVE	ASPHALT/TIMBER
00Q 35.94	341154B	113TH AVE	ACTIVE-CWT	ASPHALT/TIMBER
00Q 36.22	341155H	PARRISH ST	ACTIVE-CWT	ASPHALT/TIMBER
00Q 36.45	341156P	117TH AVE	ACTIVE-CWT	ASPHALT/TIMBER
00Q 36.69	341158D	PRIVATE RD	PASSIVE	ASPHALT/TIMBER
00Q 36.99	341159K	PRIVATE	PASSIVE	ASPHALT/TIMBER
00Q 38.99	341161L	137 TH AVE	ACTIVE-CWT	ASPHALT/TIMBER
00Q 39.50	341163A	141 ST AVE	ACTIVE-CWT	ASPHALT/TIMBER
00Q 39.70	341164G	142 ND PLACE	ACTIVE-CWT	ASPHALT/TIMBER
00Q 41.47	341166V	CRESTON RD/W155TH	ACTIVE-CWT	ASPHALT/TIMBER
00Q 41.63	341167C	CLINE AVE/CR 21	ACTIVE-CWT	ASPHALT/TIMBER
00Q 41.97	341168J	159TH AVE	ACTIVE-CWT	ASPHALT/TIMBER
00Q 42.86	341172Y	PRIVATE RD	PASSIVE	ASPHALT/TIMBER
00Q 44.53	341174M	MAIN ST	ACTIVE-CWT	ASPHALT/TIMBER
00Q 44.69	341175U	WASHINGTON AVENUE	ACTIVE-CWT	ASPHALT/TIMBER
00Q 44.72	341176B	COMMERCIAL AV/SR2	ACTIVE-CWT	ASPHALT/TIMBER
00Q 44.91	341177H	OAKLEY AVE	ACTIVE-MOTION	ASPHALT/TIMBER
00Q 46.34	341179W	BELSHAW RD	ACTIVE-CWT	ASPHALT/TIMBER
00Q 46.99	341180R	PRIVATE	PASSIVE	ASPHALT/TIMBER
00Q 47.21	341181X	197TH AVE	ACTIVE-CWT	ASPHALT/TIMBER
00Q 48.06	341182E	CLARK ST	ACTIVE-CWT	ASPHALT/TIMBER
00Q 48.36	341183L	W 205TH AVE	ACTIVE-CWT	ASPHALT/TIMBER
00Q 50.23	341186G	CHASE ST	ACTIVE-CWT	ASPHALT/TIMBER
00Q 50.56	341187N	PRIVATE	PASSIVE	ASPHALT/TIMBER
00Q 52.01	341188V	231ST ST	ACTIVE-CWT	ASPHALT/TIMBER
00Q 52.61	341189C	235TH AVE	ACTIVE-CWT	ASPHALT/TIMBER
00Q 52.92	341190W	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
00Q 53.17	341191D	FIRST ST	ACTIVE-CWT	ASPHALT/TIMBER
00Q 54.06	341192K	FRONT STREET/1200 N	ACTIVE-CWT	ASPHALT/TIMBER
00Q 54.30	341193S	55 SR	ACTIVE-CWT	RUBBER

Appendix B: Railroad-Highway At-Grade Crossings

CSX Milepost	Crossing ID	Name	Warning Device	Surface Type
00Q 55.18	341194Y	CR 1100N	PASSIVE	ASPHALT/TIMBER
00Q 56.19	341195F	CR 400E	ACTIVE-CWT	ASPHALT/TIMBER
00Q 56.34	341196M	SR10	ACTIVE-CWT	ASPHALT/TIMBER
00Q 57.55	341197U	900 N	ACTIVE-CWT	ASPHALT/TIMBER
00Q 58.71	341198B	CR 800N	PASSIVE	ASPHALT/TIMBER
00Q 60.07	341199H	COUNTY LINE ROAD	ACTIVE-CWT	ASPHALT/TIMBER
00Q 61.08	341201G	500 N	ACTIVE-CWT	ASPHALT/TIMBER
00Q 61.97	341202N	2ND STREET	ACTIVE-CWT	ASPHALT/TIMBER
00Q 62.33	341203V	400 N	ACTIVE-CWT	ASPHALT/TIMBER
00Q 63.94	341204C	CR 1000W	ACTIVE-CWT	ASPHALT/TIMBER
00Q 64.08	341205J	CR 250N	PASSIVE	ASPHALT/TIMBER
00Q 65.84	341206R	SR 14	ACTIVE-CWT	ASPHALT/TIMBER
00Q 66.16	341207X	900 W	ACTIVE-CWT	ASPHALT/TIMBER
00Q 66.92	341208E	DIVISION ROAD	ACTIVE-CWT	ASPHALT/TIMBER
00Q 67.18	341209L	850 W	ACTIVE-CWT	ASPHALT/TIMBER
00Q 68.06	341210F	100S	ACTIVE-CWT	ASPHALT/TIMBER
00Q 69.07	341211M	200 S	ACTIVE-CWT	ASPHALT/TIMBER
00Q 69.33	341212U	750W	PASSIVE	ASPHALT/TIMBER
00Q 70.20	341214H	AMSLER/300S	PASSIVE	ASPHALT/TIMBER
00Q 70.41	341215P	700W/AIRPORT ROAD	ACTIVE-CWT	ASPHALT/TIMBER
00Q 71.01	341216W	PRIVATE	PASSIVE	ASPHALT/TIMBER
00Q 71.38	341217D	400S/WOOD ROAD	ACTIVE-CWT	ASPHALT/TIMBER
00Q 72.11	341219S	MATHESON AVE/600W	PASSIVE	ASPHALT/TIMBER
00Q 72.41	341220L	JEFFERSON STREET	PASSIVE	ASPHALT/TIMBER
00Q 72.59	341221T	CULLEN ST	ACTIVE-CWT	ASPHALT/TIMBER
00Q 72.76	341223G	MCKINLEY STREET	ACTIVE-CWT	ASPHALT/TIMBER
00Q 72.85	341224N	FRANKLIN ST	ACTIVE-CWT	ASPHALT/TIMBER
00Q 72.94	341225V	WEBSTER STREET	ACTIVE-CWT	ASPHALT/TIMBER
00Q 73.02	341226C	SCOTT STREET	PASSIVE	ASPHALT/TIMBER
00Q 73.24	341227J	MELVILLE STREET	ACTIVE-CWT	ASPHALT/TIMBER
00Q 74.25	341228R	400W/MARION SCHOOL	ACTIVE-CWT	ASPHALT/TIMBER
00Q 74.37	341229X	PRIVATE RD	PASSIVE	ASPHALT/TIMBER
00Q 75.77	341230S	250 W	ACTIVE-CWT	ASPHALT/TIMBER
00Q 76.91	341231Y	150 W	ACTIVE-CWT	ASPHALT/TIMBER
00Q 77.02	341232F	114 SR	ACTIVE-CWT	ASPHALT/TIMBER
00Q 79.13	341233M	CR 50E	PASSIVE	ASPHALT/TIMBER
00Q 79.98	341235B	CR 650S/MCCOYSBURG	PASSIVE	ASPHALT/TIMBER
00Q 80.79	341236H	210 E	PASSIVE	ASPHALT/TIMBER
00Q 81.96	341237P	COUNTY LN ROAD/310E	PASSIVE	ASPHALT/TIMBER
00Q 82.81	341238W	500 W/525W	PASSIVE	ASPHALT
00Q 83.09	341239D	29 CR/YORK STREET	PASSIVE	ASPHALT
00Q 84.21	341240X	400 W	PASSIVE	ASPHALT/TIMBER
00Q 84.86	341241E	900 N	PASSIVE	ASPHALT/TIMBER
00Q 85.37	341243T	300 W	PASSIVE	ASPHALT/TIMBER

Appendix B: Railroad-Highway At-Grade Crossings

CSX Milepost	Crossing ID	Name	Warning Device	Surface Type
00Q 86.47	341245G	200 W	ACTIVE-CWT	ASPHALT/TIMBER
00Q 87.14	341246N	SR 16/BROADWAY AVENUE	ACTIVE-MOTION	ASPHALT/TIMBER
00Q 88.18	341247V	RACE STREET	PASSIVE	ASPHALT/TIMBER
00Q 88.25	341248C	ARCH ST	PASSIVE	ASPHALT/TIMBER
00Q 88.32	341251K	MARKET ST/US 421	ACTIVE-CWT	RUBBER
00Q 89.33	341254F	QUARRY RD	ACTIVE-CWT	ASPHALT/TIMBER
00Q 89.84	341255M	PRIVATE	PASSIVE	ASPHALT/TIMBER
00Q 90.13	341256U	PRIVATE RD	PASSIVE	ASPHALT/TIMBER
00Q 90.51	341257B	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
00Q 90.74	341258H	500 N MERIDIAN RD	ACTIVE-CWT	ASPHALT/TIMBER
00Q 92.11	341259P	CR 375 N	ACTIVE-CWT	ASPHALT/TIMBER
00Q 92.86	341260J	300 N	PASSIVE	ASPHALT/TIMBER
00Q 93.90	341261R	CR 200 N	PASSIVE	ASPHALT/TIMBER
00Q 94.92	341262X	CR 100 N	ACTIVE-CWT	RUBBER
00Q 95.75	341264L	JEFFERSON ST	ACTIVE-CWT	ASPHALT/TIMBER
00Q 95.93	341267G	LOGAN ST	ACTIVE-CWT	ASPHALT/TIMBER
00Q 96.04	341268N	2ND ST/US 24	ACTIVE-CWT	ASPHALT/TIMBER
00Q 96.10	341269V	3RD ST	ACTIVE-CWT	ASPHALT/TIMBER
00Q 96.92	341271W	100S CR	ACTIVE-CWT	ASPHALT/TIMBER
00Q 97.62	341272D	PRIVATE RD	PASSIVE	ASPHALT/TIMBER
00Q 98.21	341273K	SMITHSON ROAD	PASSIVE	ASPHALT/TIMBER
00Q 99.21	341274S	PRIVATE RD	PASSIVE	ASPHALT/TIMBER
00Q 99.47	341275Y	300 N	PASSIVE	ASPHALT/TIMBER
00Q 101.99	341278U	WALNUT ST	ACTIVE-MOTION	ASPHALT/TIMBER
00Q 102.06	341279B	MAIN ST	ACTIVE-MOTION	ASPHALT/TIMBER
00Q 102.99	341282J	CR 700 S	ACTIVE-CWT	ASPHALT/TIMBER
00Q 103.48	341283R	CEMETERY	PASSIVE	ASPHALT/TIMBER
00Q 103.85	341284X	CHALMERS WATER	PASSIVE	ASPHALT/TIMBER
00Q 104.97	341285E	CR 900 S	ACTIVE-MOTION	ASPHALT/TIMBER
00Q 106.17	341287T	3RD STREET	ACTIVE-MOTION	ASPHALT/TIMBER
00Q 106.24	341288A	4TH ST WEST	ACTIVE-MOTION	ASPHALT/TIMBER
00Q 106.48	341289G	8TH STREET	ACTIVE-MOTION	ASPHALT/TIMBER
00Q 107.50	341290B	PRIVATE (ROBINSON)	PASSIVE	ASPHALT/TIMBER
00Q 107.85	341291H	PRIVATE	PASSIVE	ASPHALT/TIMBER
00Q 108.57	341292P	1250S CR	ACTIVE-CWT	ASPHALT/TIMBER
00Q 110.13	341294D	CR 900N	ACTIVE-CWT	ASPHALT/TIMBER
00Q 110.51	341295K	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
00Q 111.27	341296S	PRIVATE RD	PASSIVE	ASPHALT/TIMBER
00Q 111.86	341297Y	PRIVATE RD	PASSIVE	ASPHALT/TIMBER
00Q 112.14	341298F	PRIVATE RD	PASSIVE	ASPHALT/TIMBER
00Q 112.53	341299M	RAILROAD STREET	ACTIVE-MOTION	ASPHALT/TIMBER
00Q 112.88	341300E	NORTH ST/SR 225	ACTIVE-MOTION	ASPHALT/TIMBER
00Q 115.29	341304G	SWISHER ROAD	ACTIVE-CWT	ASPHALT/TIMBER
00Q 115.46	341305N	PRIVATE RD	PASSIVE	ASPHALT/TIMBER

Appendix B: Railroad-Highway At-Grade Crossings

CSX Milepost	Crossing ID	Name	Warning Device	Surface Type
00Q 116.80	341306V	PRIVATE RD	PASSIVE	ASPHALT/TIMBER
00Q 116.91	341307C	PRIVATE RD	PASSIVE	ASPHALT/TIMBER
00Q 117.14	937145C	LAFAYETTE	PASSIVE	ASPHALT/TIMBER
00Q 119.43	973687G	LAFAYETTE YARD	PASSIVE	ASPHALT/TIMBER
00Q 121.71	341347A	WABASH AVBECK LN	ACTIVE-MOTION	ASPHALT/TIMBER
00Q 123.07	341349N	LILLY RD/400S	ACTIVE-MOTION	ASPHALT/TIMBER
00Q 123.79	341352W	CR 275S	PASSIVE	ASPHALT/TIMBER
00Q 124.08	341353D	PRIVATE (WEAVER LN)	PASSIVE	ASPHALT/TIMBER
00Q 125.15	341354K	PRIVATE (400S)	PASSIVE	ASPHALT/TIMBER
00Q 126.52	341355S	CR 550S	ACTIVE-MOTION	ASPHALT/TIMBER
00Q 127.61	341357F	CR 625S	ACTIVE-CWT	ASPHALT/TIMBER
00Q 128.16	341358M	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
00Q 128.43	341359U	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
00Q 129.45	341360N	800S/SOUTHWESTERN	ACTIVE-CWT	ASPHALT/TIMBER
00Q 130.64	341361V	CR 925S	PASSIVE	ASPHALT/TIMBER
00Q 132.43	341362C	SR 28	ACTIVE-MOTION	ASPHALT/TIMBER
00Q 132.94	341363J	CR 1150S	ACTIVE-MOTION	ASPHALT/TIMBER
00Q 133.44	341364R	CR 1200S	PASSIVE	ASPHALT/TIMBER
00Q 135.06	341365X	BENNETT RD	PASSIVE	ASPHALT/TIMBER
00Q 136.46	341367L	CR 1100N	ACTIVE-CWT	ASPHALT/TIMBER
00Q 137.30	341371B	WALNUT ST	ACTIVE-CWT	ASPHALT/TIMBER
00Q 137.44	341374W	SOUTH ST	ACTIVE-CWT	ASPHALT/TIMBER
00Q 137.98	341375D	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
00Q 138.69	341376K	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
00Q 139.42	341379F	CR 800N	ACTIVE-CWT	ASPHALT/TIMBER
00Q 139.53	341380A	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
00Q 139.91	341381G	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
00Q 140.42	341382N	700 NORTH	ACTIVE-CWT	ASPHALT/TIMBER
00Q 140.81	341383V	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
00Q 140.92	341384C	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
00Q 141.57	341385J	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
00Q 142.05	341386R	CR 550 N	ACTIVE-MOTION	ASPHALT/TIMBER
00Q 142.48	341387X	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
00Q 142.65	341388E	PRIVATE ROAD	ACTIVE-MOTION	ASPHALT/TIMBER
00Q 142.83	341389L	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
00Q 143.55	341390F	CR 400 NORTH	ACTIVE-CWT	ASPHALT/TIMBER
00Q 144.12	341391M	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
00Q 145.17	341393B	CR 55/CONCORD RD	ACTIVE-CWT	ASPHALT/TIMBER
00Q 146.25	341394H	PRIVATE	PASSIVE	ASPHALT/TIMBER
00Q 146.77	341395P	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
00Q 147.03	341396W	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
00Q 147.54	341400J	136 US/SR 47/MARKET STREET	ACTIVE-MOTION	ASPHALT/TIMBER
00Q 147.67	341404L	MAIN STREET	ACTIVE-CWT	ASPHALT/TIMBER
QSC 45.67	543073K	ELMORE STREET	ACTIVE-MOTION	ASPHALT/TIMBER

Appendix B: Railroad-Highway At-Grade Crossings

CSX Milepost	Crossing ID	Name	Warning Device	Surface Type
QSC 45.45	543072D	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
QSC 44.95	543071W	CR 200E	ACTIVE-CWT	ASPHALT/TIMBER
QSC 44.30	543070P	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
QSC 43.60	543069V	CR 150 S	PASSIVE	ASPHALT/TIMBER
QSC 42.72	543067G	NUCOR RD	ACTIVE-MOTION	ASPHALT/TIMBER
QSC 42.09	543066A	CR 450E	PASSIVE	ASPHALT/TIMBER
QSC 41.10	543065T	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
QSC 41.00	543064L	CR 550 E	ACTIVE-CWT	ASPHALT
QSC 40.50	543063E	CR 300S	PASSIVE	ASPHALT/TIMBER
QSC 40.42	543062X	CR 600E	PASSIVE	ASPHALT/TIMBER
QSC 39.51	543061R	CR 675E	PASSIVE	ASPHALT/TIMBER
QSC 39.40	543060J	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
QSC 38.40	543059P	CR 775 E	ACTIVE-MOTION	ASPHALT/TIMBER
QSC 37.50	543058H	CR 850E	PASSIVE	ASPHALT/TIMBER
QSC 36.70	543057B	136 US/VALLEY DRIVE	ACTIVE-MOTION	RUBBER
QSC 36.31	543055M	CR 500S	ACTIVE-CWT	ASPHALT/TIMBER
QSC 35.80	543053Y	MAIN ST	ACTIVE-CWT	ASPHALT/TIMBER
QSC 35.20	543052S	CR 1050E	PASSIVE	ASPHALT/TIMBER
QSC 34.42	543051K	NEW ROSS RD	PASSIVE	ASPHALT/TIMBER
QSC 34.16	543050D	CR 600S	PASSIVE	ASPHALT/TIMBER
QSC 33.32	543049J	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
QSC 32.71	543048C	CR 1025W	PASSIVE	ASPHALT/TIMBER
QSC 32.00	543046N	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
QSC 31.67	543045G	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
QSC 31.61	543044A	PRIVATE	PASSIVE	ASPHALT/TIMBER
QSC 30.70	543042L	DARLINGTON STREET	ACTIVE-MOTION	ASPHALT/TIMBER
QSC 30.60	543041E	HIGH ST	ACTIVE-MOTION	ASPHALT/TIMBER
QSC 30.50	543040X	LEBANON ST/ SR75	ACTIVE-MOTION	ASPHALT/TIMBER
QSC 30.20	543039D	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
QSC 30.01	543038W	CO LINE ROAD	ACTIVE-CWT	ASPHALT/TIMBER
QSC 29.45	938306Y	OLD STATE RD 34	ACTIVE-CWT	ASPHALT/TIMBER
QSC 26.5	543032F	CR 200W	ACTIVE-MOTION	ASPHALT/TIMBER
QSC 25.90	543031Y	CR 151W	PASSIVE	ASPHALT/TIMBER
QSC 25.31	543029X	LEBANON STREET	ACTIVE-MOTION	ASPHALT/TIMBER
QSC 25.19	543028R	39 SR/STATE ST	ACTIVE-MOTION	ASPHALT/TIMBER
QSC 24.51	543027J	CR 21W	PASSIVE	ASPHALT/TIMBER
QSC 23.47	543026C	CR 75E	PASSIVE	ASPHALT/TIMBER
QSC 23.22	543025V	CR 100E	PASSIVE	ASPHALT/TIMBER
QSC 22.70	543024N	CR 150E	PASSIVE	ASPHALT/TIMBER
QSC 21.62	926174G	PITTSBORO ROAD	ACTIVE-MOTION	RUBBER
QSC 21.12	543022A	MERIDIAN STREET	ACTIVE-MOTION	RUBBER
QSC 21.00	543021T	MAPLE STREET	ACTIVE-MOTION	ASPHALT/TIMBER
QSC 19.77	543020L	CR 475E	ACTIVE-MOTION	ASPHALT/TIMBER
QSC 19.00	543019S	550E	ACTIVE-CWT	ASPHALT/TIMBER

Appendix B: Railroad-Highway At-Grade Crossings

CSX Milepost	Crossing ID	Name	Warning Device	Surface Type
QSC 18.20	543018K	WEST NORTHFIELD DRIVE	ACTIVE-CWT	CONCRETE
QSC 17.04	543016W	GREEN STREET	ACTIVE-CWT	RUBBER
QSC 16.80	543014H	JEFFERSON ST	ACTIVE-MOTION	ASPHALT/TIMBER
QSC 16.67	543013B	GRANT STREET	ACTIVE-MOTION	ASPHALT/TIMBER
QSC 16.45	918544M	ODELL STREET	ACTIVE-CWT	ASPHALT/TIMBER
QSC 16.17	543011M	PRIVATE ROAD	PASSIVE	ASPHALT/TIMBER
QSC 15.33	918468W	NORTH FIELD DRIVE EAST	ACTIVE-CWT	CONCRETE
QSC 14.96	543008E	CRAWFORDSVILLE RD/CR900E	ACTIVE-MOTION	ASPHALT/TIMBER
QSC 13.95	543005J	HUNTER RD/1000E	ACTIVE-CWT	ASPHALT/TIMBER
QSC 13.70	543004C	LUCAS OIL RACEWAY	PASSIVE	ASPHALT/TIMBER
QSC 13.20	543001G	RACEWAY/COLINE RD	ACTIVE-CWT	ASPHALT/TIMBER
QSC 12.74	542998T	TANSEL RD	ACTIVE-MOTION	ASPHALT/TIMBER
QSC 7.16	545080C	GIRLS SCHOOL ROAD	ACTIVE-MOTION	ASPHALT/TIMBER
QSC 5.55	539048V	MICKLEY AVENUE	ACTIVE-MOTION	ASPHALT/TIMBER
QSC 4.98	539047N	LYNHURST DR	ACTIVE-CWT	ASPHALT/TIMBER
QSC 2.01	539040R	BELMONT AVE	ACTIVE-CWT	ASPHALT/TIMBER
QSC 1.50	539039W	HARDING ST	ACTIVE-CWT	ASPHALT/TIMBER

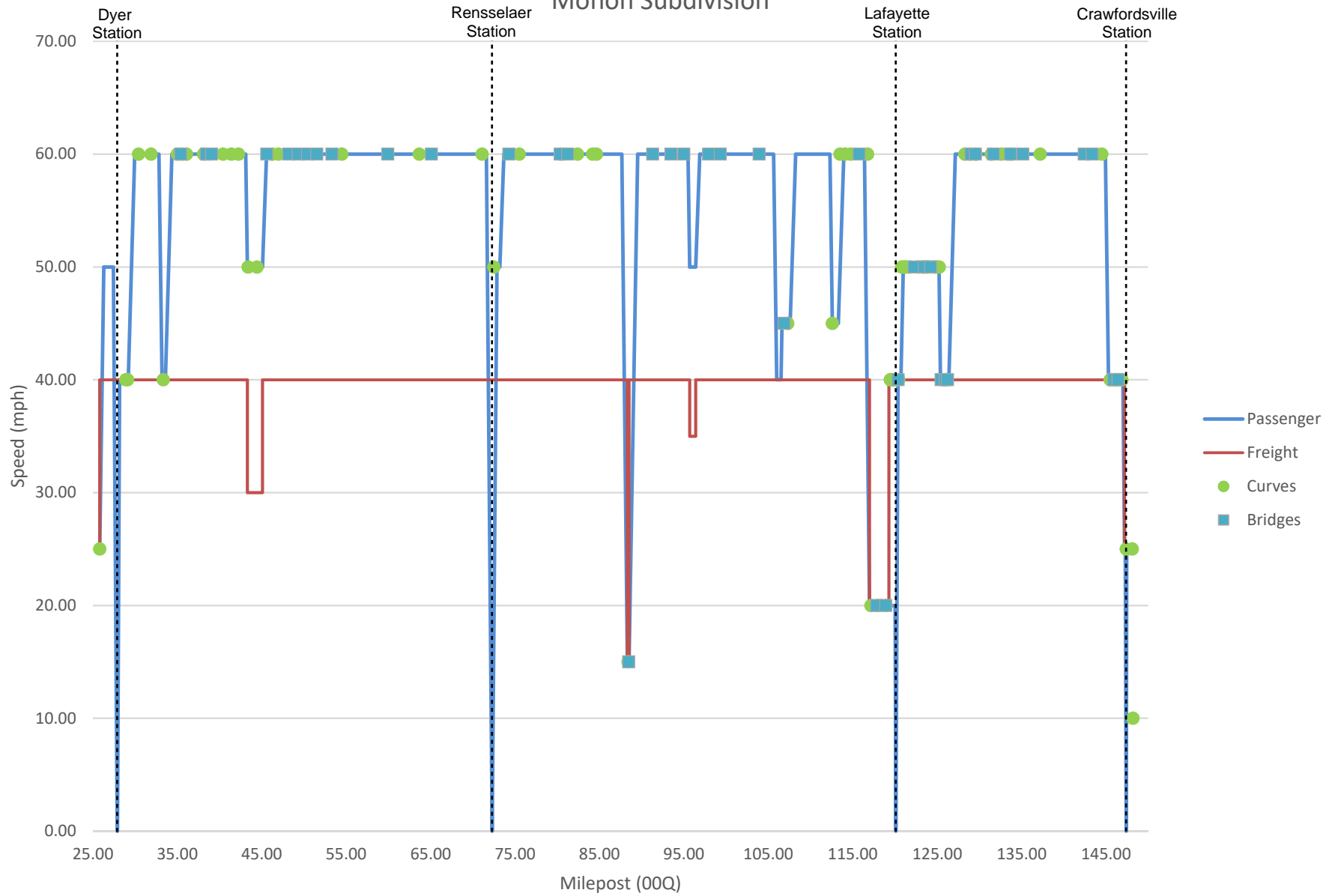
Appendix C

Speed Profile Charts

Description:

1. Existing Hoosier State Speed Profile Charts
2. Proposed Hoosier State Speed Profile Charts (Max. Operating Speed of 79 mph)

Existing Hoosier State Speed Profile Monon Subdivision



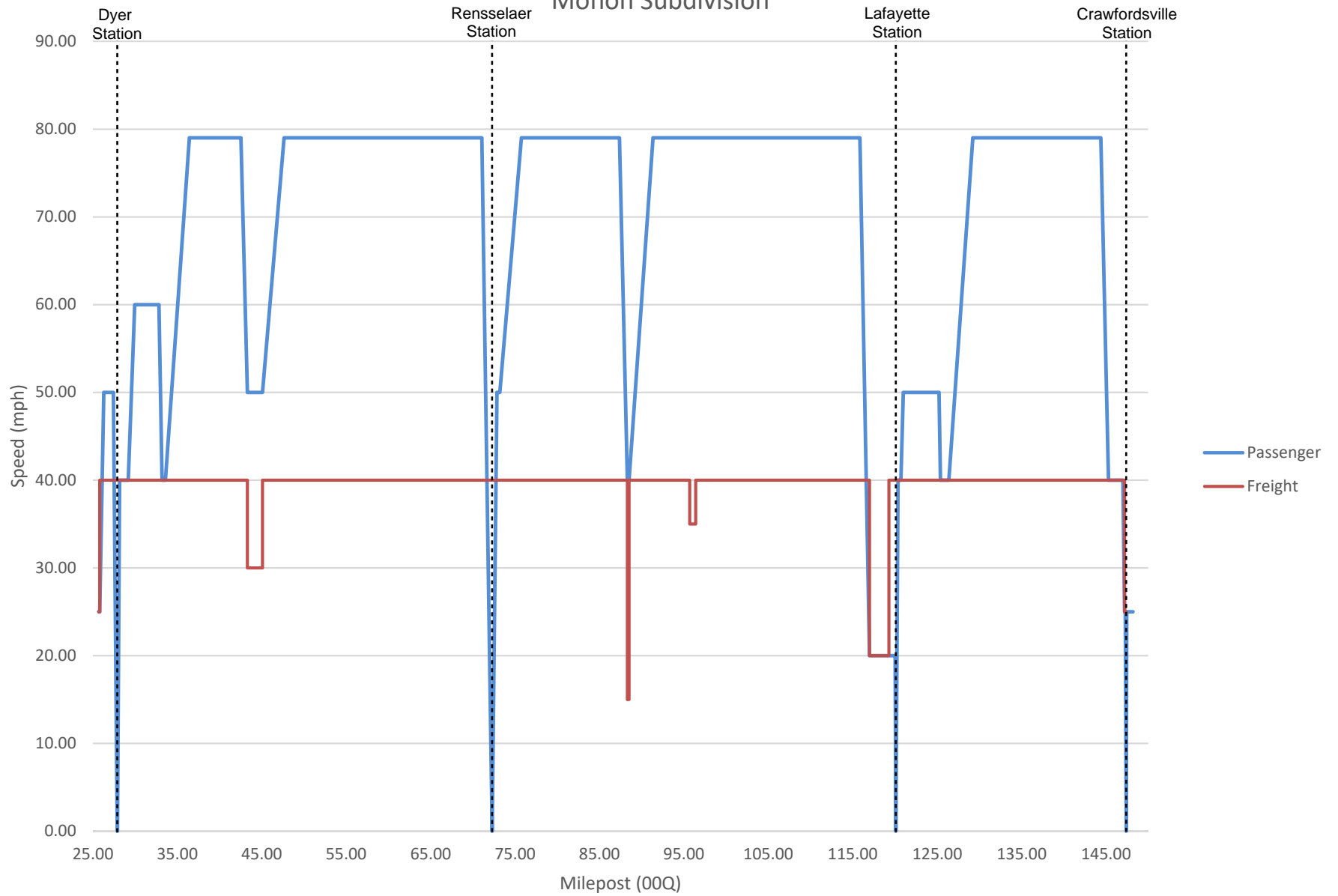
Existing Hoosier State Speed Profile Crawfordsville Subdivision

Indianapolis
Union Station



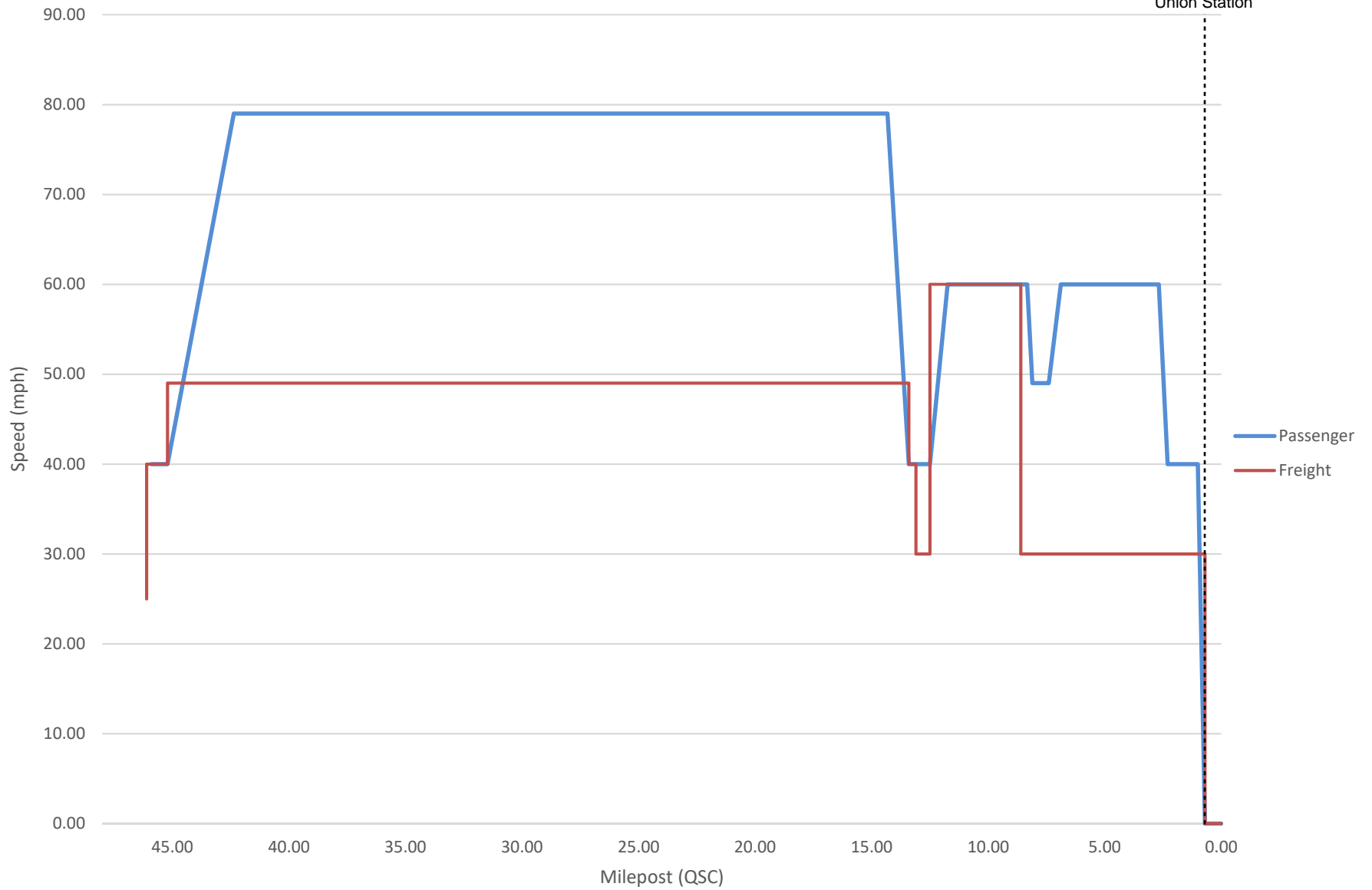
Proposed Hoosier State Speed Profile

Monon Subdivision



Proposed Hoosier State Speed Profile Crawfordsville Subdivision

Indianapolis
Union Station

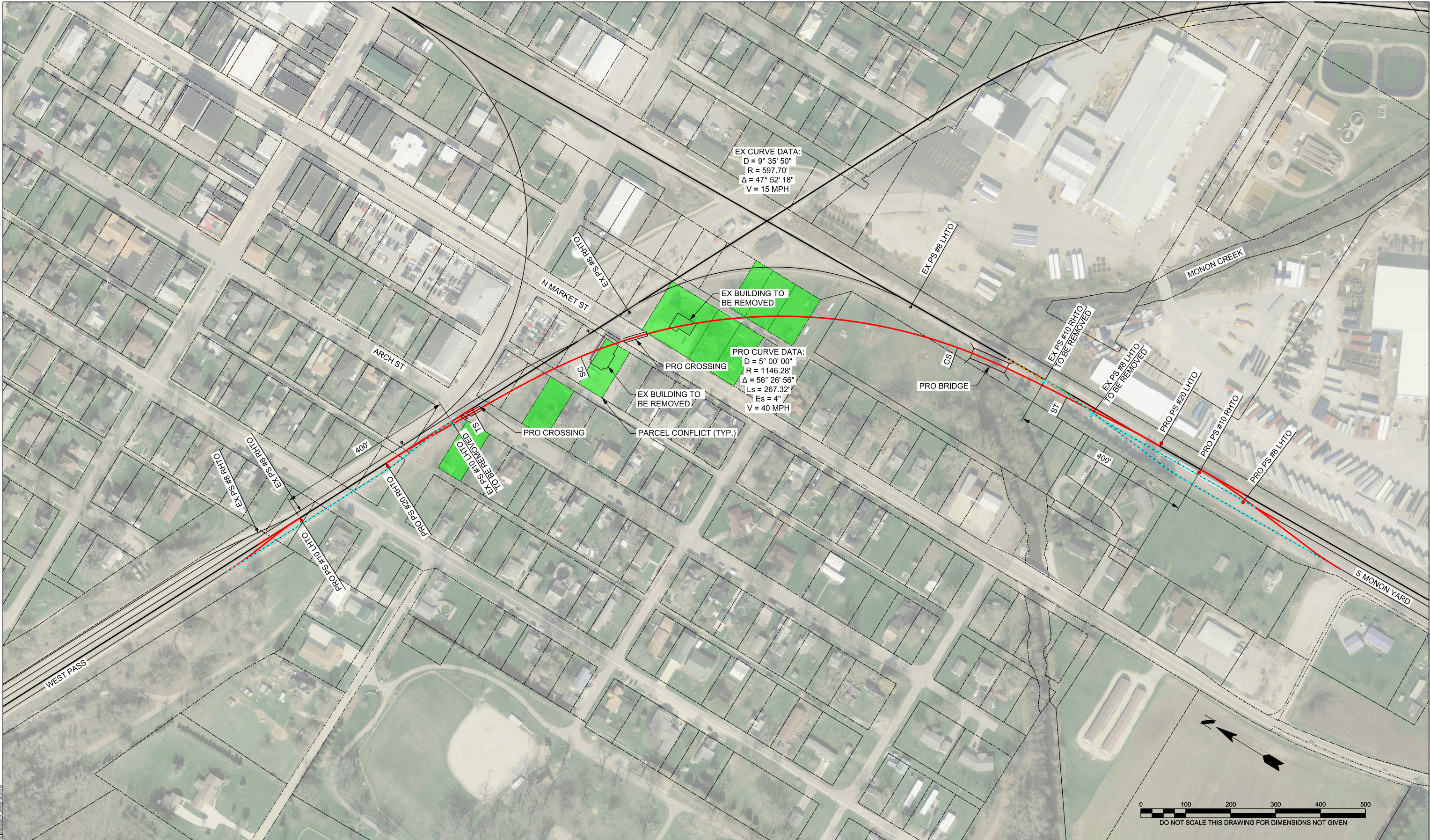


Appendix D

Conceptual Drawings

Description:

1. EX – 1 Conceptual Monon Interchange Curve Realignment
2. EX – 2 Conceptual Lafayette Yard Improvements
3. EX – 3 Conceptual Ames Interlocking Improvement
4. EX – 4 Conceptual CP Clermont Curve Improvement
5. EX – 5 Conceptual Kraft Runner Connection
6. EX – 6 Conceptual Indianapolis Airport Station Layout

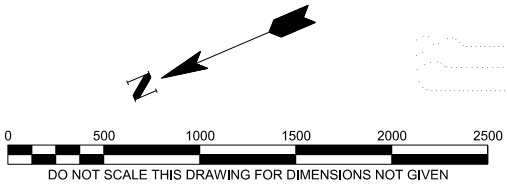
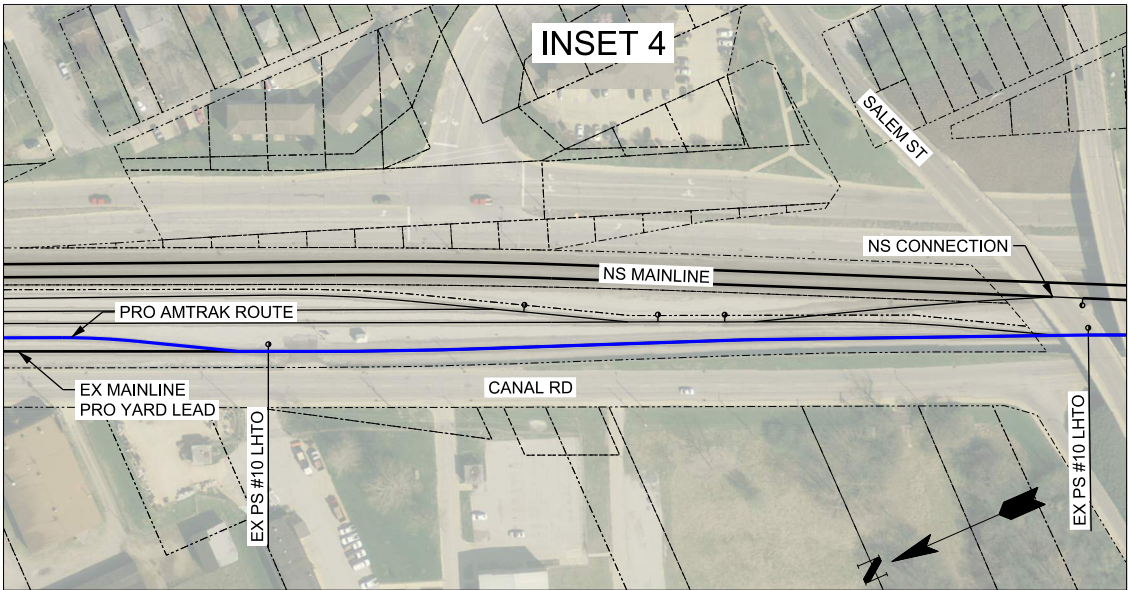
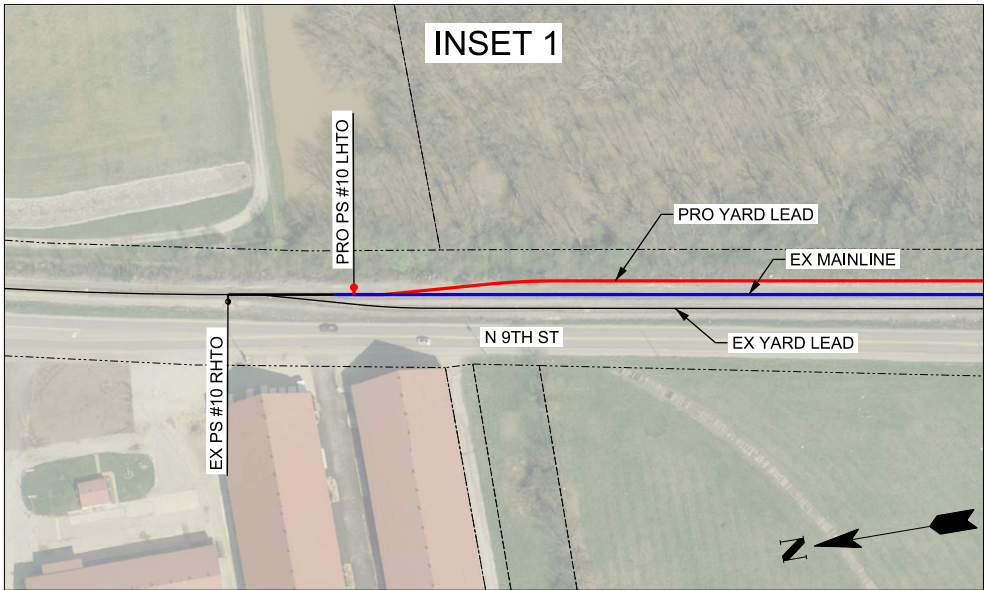
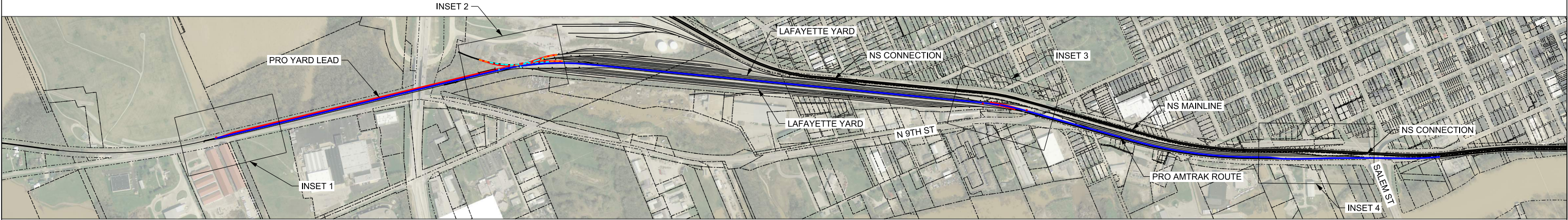
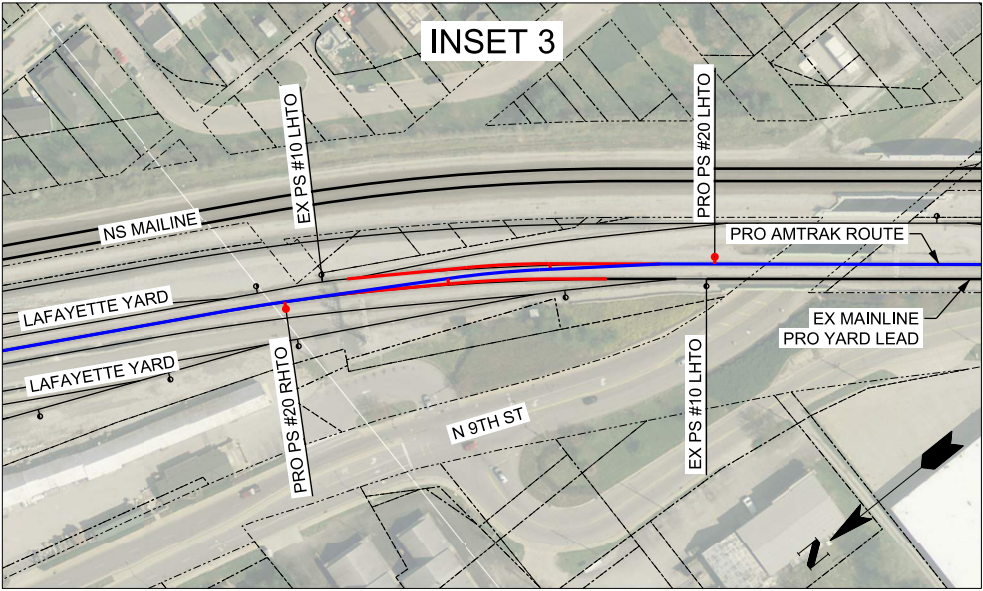
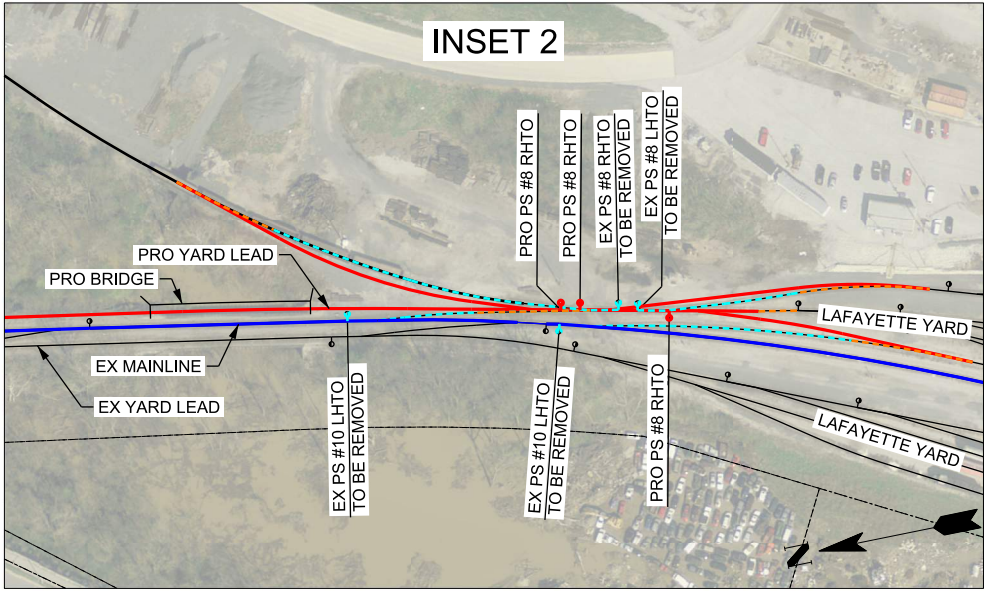


CONCEPT FOR DISCUSSION		
ISSUES & REVISIONS		
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TEL: (630) 795-7367
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www.patrickco.com

PROJECT:	AMTRAK & CSX HOOSIER STATE RAIL		PROJECT NO.:	21677.046	DATE:	5/10/2018
	SHEET TITLE:		DESIGNED BY:	TBO	SHEET NO.	
	EXHIBIT 1 MONON INTERCHANGE IMPROVEMENT		DRAWN BY:	TBO	EX-1	
	CSX - CHICAGO DIVISION - MONON SUBDIVISION		CHECKED BY:	GTC		
			APPROVED BY:	GTC	SHEET 1 OF 1	



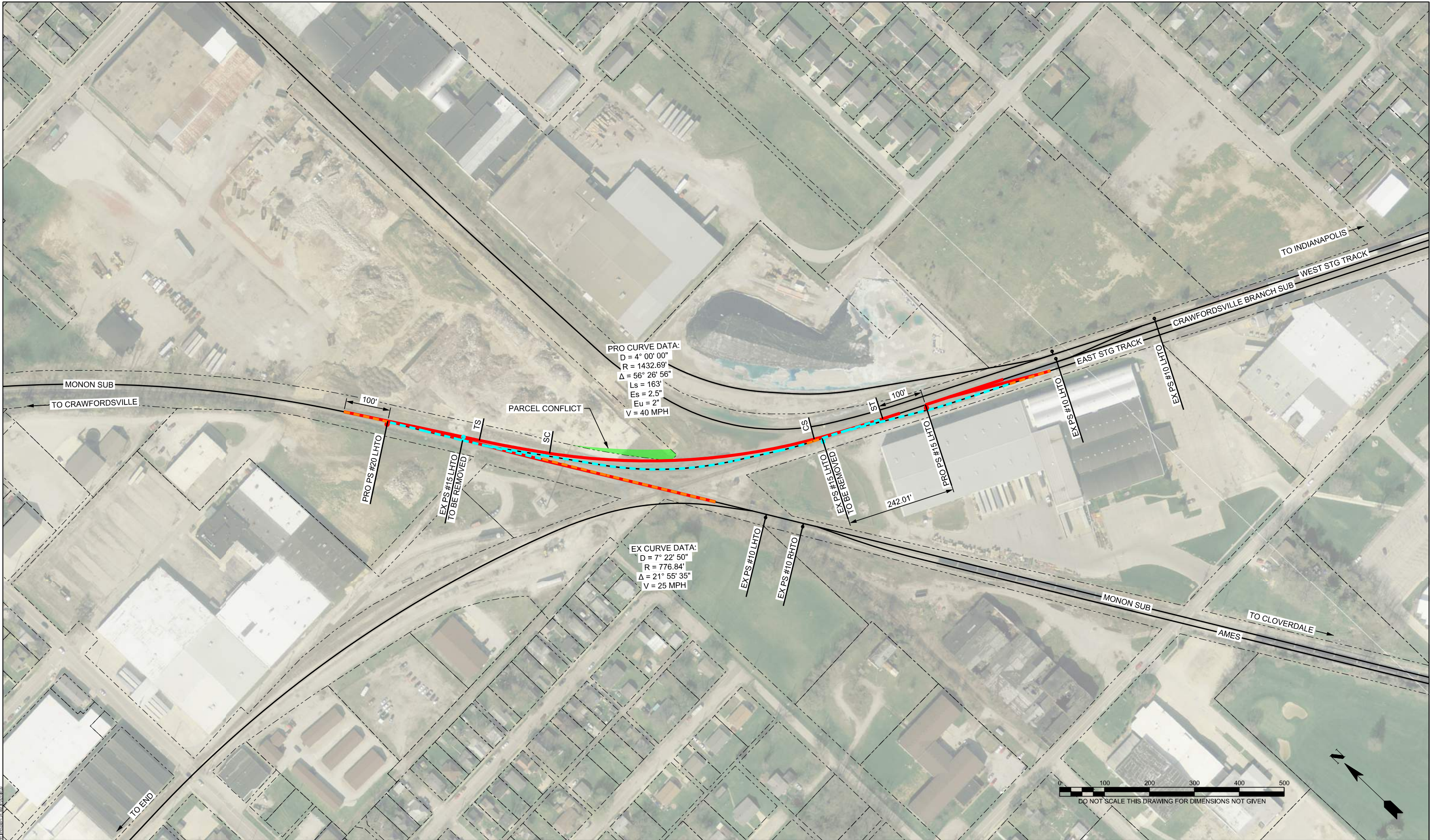
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	SHEET TITLE: EXHIBIT 2 LAFAYETTE YARD IMPROVEMENT CSX - CHICAGO DIVISION - MONON SUBDIVISION		DESIGNED BY	TBO	SHEET NO. EX-2	
			DRAWN BY	TBO		
			CHECKED BY	GTC		
			APPROVED BY	GTC	SHEET 1 OF 1	



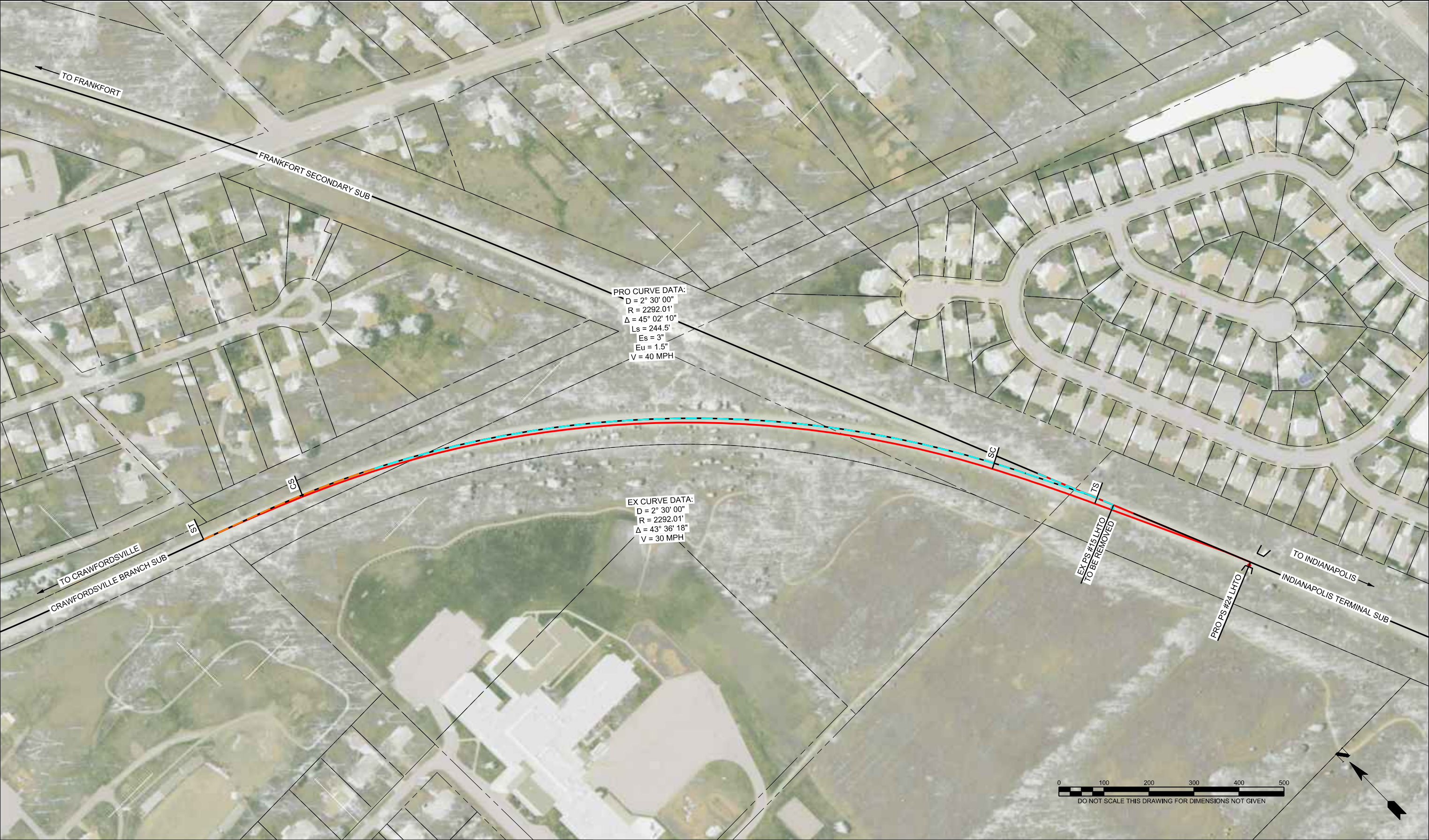
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PROJECT:	AMTRAK & CSX HOOSIER STATE RAIL		PROJECT NO:	21677.046	DATE:	10/1/2018
	EXHIBIT 5 AMES INTERLOCKING IMPROVEMENT		DESIGNED BY:	TBO	SHEET NO. EX-3 SHEET 1 OF 1	
	CSX - GREAT LAKES DIVISION - CRAWFORDSVILLE BRANCH SUB		DRAWN BY:	TBO		
			CHECKED BY:	GTC		
			APPROVED BY:	GTC		

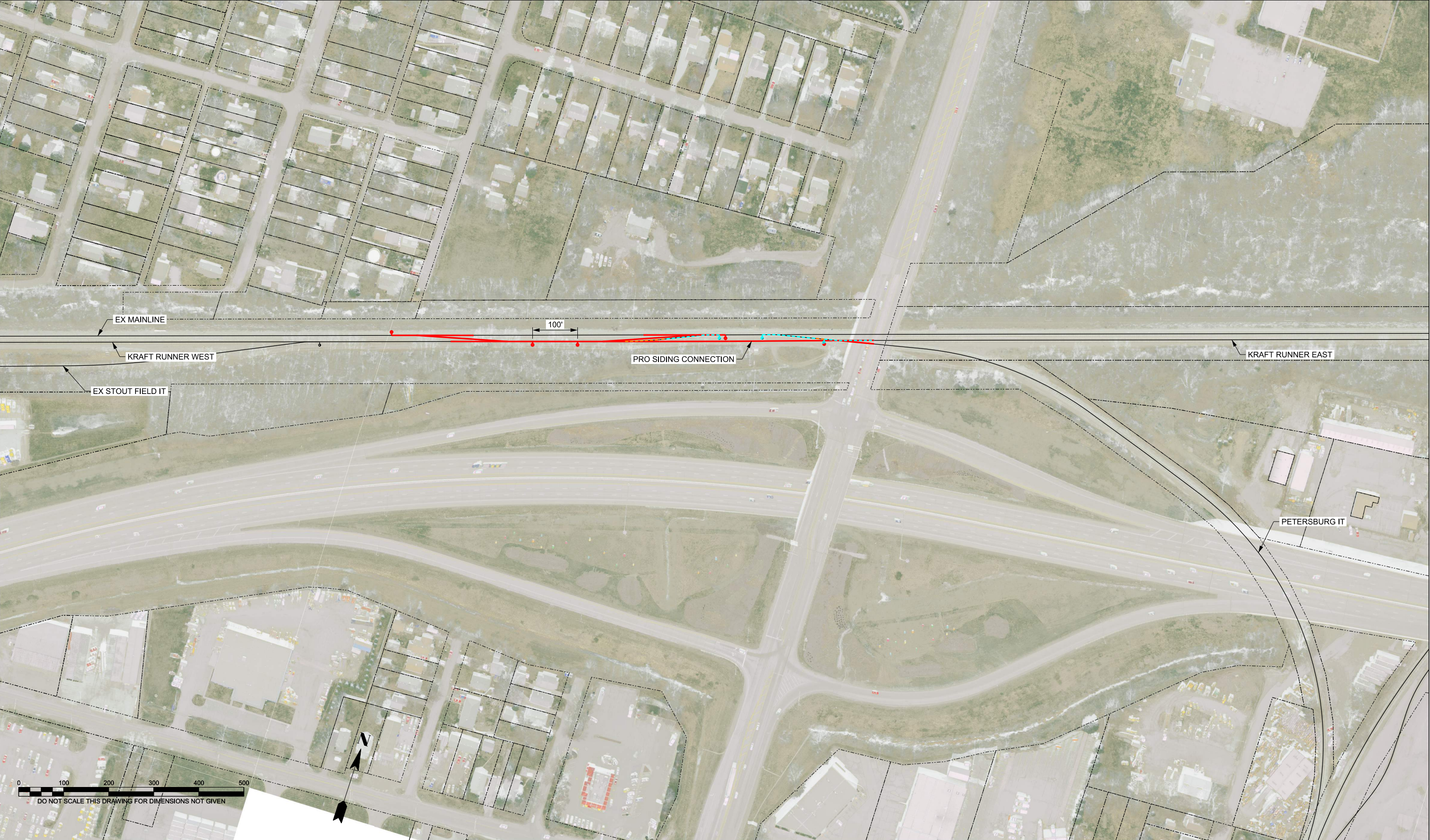


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		DESIGNED BY	TBO	SHEET NO. EX-4 SHEET 1 OF 1
SHEET TITLE:	EXHIBIT 6B CP CLERMONT IMPROVEMENT	DRAWN BY	TBO	
		CHECKED BY	GTC	
CSX - GREAT LAKES DIVISION - CRAWFORDSVILLE BRANCH SUB		APPROVED BY	GTC	



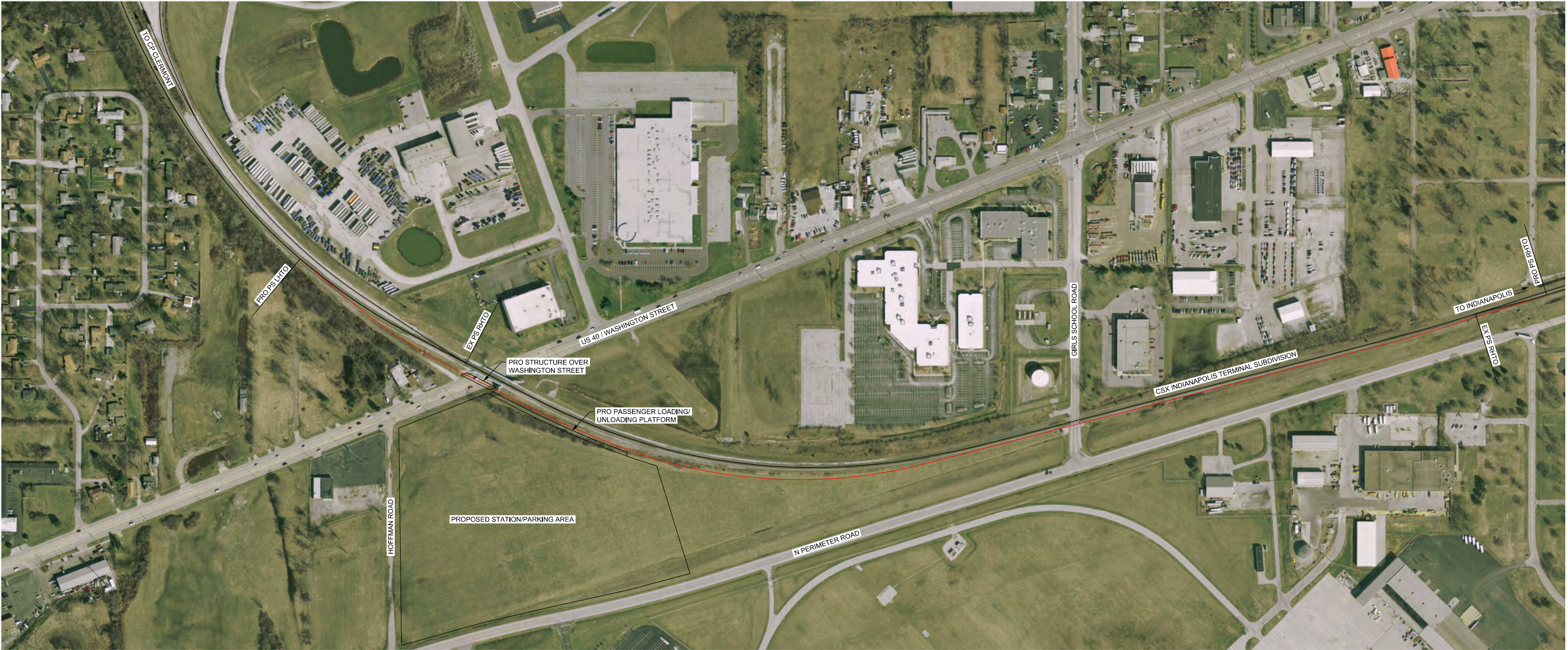
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PROJECT:	AMTRAK & CSX HOOSIER STATE RAIL		PROJECT NO.: 21677.046		DATE: 5/14/2018	
	SHEET TITLE: EXHIBIT 4 KRAFT RUNNER CONNECTION CSX - CHICAGO DIVISION - INDIANAPOLIS TERMINAL SUBDIVISION		DESIGNED BY TBO		SHEET NO. EX-5 SHEET 1 OF 1	
DRAWN BY TBO						
CHECKED BY GTC						
APPROVED BY GTC						



CONCEPT FOR DISCUSSION

ISSUES & REVISIONS		
REV.	DATE	DESCRIPTION



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PROJECT:	AMTRAK & CSX HOOSIER STATE RAIL	PROJECT NO: 21677.046		DATE: 11/5/2019
		DESIGNED BY	TBO	SHEET NO. EX-6 SHEET 1 OF 1
SHEET TITLE:	EXHIBIT 1 PRO AIRPORT STATION LOCATION	DRAWN BY	TBO	
		CHECKED BY	GTC	
		CSX - CHICAGO DIVISION - INDIANAPOLIS TERMINAL SUBDIVISION		

Appendix E

Order of Magnitude Cost Estimates

Description:

1. Order of Magnitude Estimate for Improvements Required to Support Two (2) Daily Round Trips
2. Order of Magnitude Estimate for Improvements Required to Support a Maximum Operating Speed of 79 mph

MAIN WORKSHEET		Issue Date 5/4/16	
Grantee Name: Indiana Department of Transportation		Today's Date	10/31/19
Project Name and Location: Hoosier State CSX Track Upgrade (MP QSC 0.0 - MP 00Q 25.7)		Yr of Base Year \$	2019
Current Phase : Order of Magnitude Estimate to Support 2RT Daily		Yr of Revenue Ops	2024

STANDARD COST CATEGORY	UNITS	QUANTITY	BASE YEAR DOLLARS			
			UNIT PRICE	TOTAL	PERCENTAGE OF CONSTRUCTION COSTS	PERCENTAGE OF TOTAL PROJECT COSTS
10 GUIDEWAY & TRACK ELEMENTS				\$ 46,080,000	53%	31%
10.010 Guideway: At-grade exclusive right-of-way	Lineal Miles of Guideway			\$ -		
10.020 Guideway: At-grade semi-exclusive (allows cross-traffic)	Lineal Miles of Guideway			\$ -		
10.030 Guideway: At-grade in mixed traffic	Lineal Miles of Guideway			\$ -		
10.040 Guideway: Aerial structure	Lineal Miles of Guideway			\$ -		
10.041 Bridges, Culverts, Drainage Improvements (Existing)	Square Feet of Structure			\$ -		
10.041 Bridges, Culverts, Drainage Improvements (New Sidings/Extensions)	Square Feet of Structure	7600	\$ 800	\$ 6,080,000		
10.050 Guideway: Built-up fill	Lineal Miles of Guideway			\$ -		
10.060 Guideway: Underground cut & cover	Lineal Miles of Guideway			\$ -		
10.070 Guideway: Underground tunnel	Lineal Miles of Guideway			\$ -		
10.080 Guideway: Retained cut or fill	Lineal Miles of Guideway			\$ -		
10.090 Track: Direct fixation	Track Miles			\$ -		
10.100 Track: Embedded	Track Miles			\$ -		
10.110 Track: Ballasted	Track Miles			\$ -		
10.111 Track: Ballasted, Rehabilitate (Mainline)	Track Miles			\$ -		
10.112 Track: Ballasted (New Sidings/Extensions)	Track Miles	13	\$ 1,250,000	\$ 16,250,000		
10.113 Track: Ballasted, Rehabilitate (Sidings)	Track Miles	6	\$ 750,000	\$ 4,500,000		
10.114 Track: Ballasted, Curve Modification (Speed)	Track Miles			\$ -		
10.115 Track: Ballasted, Industry Track Improvements/Adjustments (FTI)	Each	8	\$ 1,000,000	\$ 8,000,000		
10.120 Track: Special (higher speed switches, turnouts)	Each	19	\$ 500,000	\$ 9,500,000		
10.121 Track: Special (switches, turnouts)	Each	14	\$ 125,000	\$ 1,750,000		
10.130 Track: Vibration and noise dampening	Track Miles			\$ -		
10.140 Special Structures	Lineal Miles of Guideway			\$ -		
20 STATIONS, STOPS, TERMINALS, INTERMODAL				\$ -	0%	0%
20.010 At-grade station, stop, shelter, mall, terminal, platform	Stations			\$ -		
20.020 Aerial station, stop, shelter, mall, terminal, platform	Stations			\$ -		
20.030 Underground station, stop, shelter, mall, terminal, platform	Stations			\$ -		
20.040 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	Stations			\$ -		
20.050 Joint development	Stations			\$ -		
20.060 Automobile parking multi-story structure	Stations			\$ -		
20.070 Elevators, escalators	Number			\$ -		
20.080 Passenger Overpass	Number			\$ -		
20.090 Underground Interconnecting Tunnel	Number			\$ -		
20.100 Signage and Graphics	Number			\$ -		
30 SUPPORT FACILITIES				\$ -	0%	0%
30.010 Administration Building: Office, sales, storage, revenue counting	Number			\$ -		
30.020 Light Maintenance Facility	Number			\$ -		
30.030 Heavy Maintenance Facility	Number			\$ -		
30.040 Storage or Maintenance of Way Building	Number			\$ -		
30.050 Yard and Yard Track	Number			\$ -		
40 SITEWORK & SPECIAL CONDITIONS				\$ 30,000,000	34%	20%
40.010 Demolition, Clearing, Earthwork	Lineal Miles of Guideway			\$ -		
40.020 Site Utilities, Utility Relocation	Lineal Miles of Guideway			\$ -		
40.030 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments	Lineal Miles of Guideway			\$ -		
40.040 Environmental mitigation, e.g. wetlands, historic/archeologic, parks	Lineal Miles of Guideway			\$ -		
40.050 Site structures including retaining walls, sound walls, fencing	Lineal Miles of Guideway	3	\$ 500,000	\$ 1,500,000		
40.060 Pedestrian / bike access and accommodation, landscaping	Lineal Miles of Guideway			\$ -		
40.070 Automobile, bus, van accessways including roads, parking lots	Lineal Miles of Guideway			\$ -		
40.071 Road Closures	Each	4	\$ 50,000	\$ 200,000		
40.072 Grade Crossings	Each	6	\$ 50,000	\$ 300,000		
40.073 Grade Separations	Each	4	\$ 7,000,000	\$ 28,000,000		
40.080 Temporary Facilities and other indirect costs during construction	Lineal Miles of Guideway			\$ -		
50 SYSTEMS				\$ 11,125,000	13%	7%
50.010 Train control and signals	Track Miles	15	\$ 575,000	\$ 8,625,000		
50.020 Traffic signals and crossing protection	Each			\$ -		
50.021 CWT gate system - Existing	Each	2	\$ 250,000	\$ 500,000		
50.022 CWT gate system - New	Each	4	\$ 500,000	\$ 2,000,000		
50.030 Traction power supply: substations	Track Miles			\$ -		
50.040 Traction power distribution: catenary and third rail	Track Miles			\$ -		
50.050 Communications	Lineal Miles of Guideway			\$ -		
50.060 Fare collection system and equipment	Stations			\$ -		
50.070 Central Control	Lineal Miles of Guideway			\$ -		
CONSTRUCTION SUBTOTAL (10-50)				\$ 87,205,000	100%	58%
60 ROW, LAND, EXISTING IMPROVEMENTS				\$ 3,750,000		3%
60.010 Purchase or lease of real estate	Lineal Miles of Guideway			\$ -		
60.016 Unspecified	Lineal Miles of Guideway	15	\$ 250,000	\$ 3,750,000		
60.020 Relocation of existing households and businesses	Lineal Miles of Guideway			\$ -		
80 PROFESSIONAL SERVICES (10-50)				\$ 24,421,000		16%
80.010 Preliminary Engineering			4.0%	\$ 3,489,000		
80.020 Final Design			8.0%	\$ 6,977,000		
80.030 Project Management for Design and Construction			3.0%	\$ 2,617,000		
80.040 Construction Administration & Management			8.0%	\$ 6,977,000		
80.050 Professional Liability and other Non-Construction Insurance			0.0%	\$ -		
80.060 Legal; Permits; Review Fees by other agencies, cities, etc.			0.0%	\$ -		
80.070 Surveys, Testing, Investigation, Inspection			5.0%	\$ 4,361,000		
80.080 Start up			0.0%	\$ -		
SUBTOTAL (10-80)				\$ 115,376,000		77%
90 UNALLOCATED CONTINGENCY	Total Amount		30%	\$ 34,613,000		23%
SUBTOTAL (10-90)				\$ 149,989,000		100%
100 FINANCE CHARGES	Total Amount					0%
TOTAL PROJECT COSTS (10-100)				\$ 149,989,000		100%

MAIN WORKSHEET			Issue Date 5/4/16	
Grantee Name: Indiana Department of Transportation			Today's Date	10/31/19
Project Name and Location: Hoosier State CSX Track Upgrade (MP QSC 0.0 - MP 00Q 25.7)			Yr of Base Year \$	2019
Current Phase : Order of Magnitude Estimate to Support Max. Operating Speed of 79 MPH			Yr of Revenue Ops	2024

STANDARD COST CATEGORY	UNITS	QUANTITY	BASE YEAR DOLLARS			
			UNIT PRICE	TOTAL	PERCENTAGE OF CONSTRUCTION COSTS	PERCENTAGE OF TOTAL PROJECT COSTS
10 GUIDEWAY & TRACK ELEMENTS				\$ 189,560,000	60%	36%
10.010 Guideway: At-grade exclusive right-of-way	Lineal Miles of Guideway		\$ -	\$ -		
10.020 Guideway: At-grade semi-exclusive (allows cross-traffic)	Lineal Miles of Guideway		\$ -	\$ -		
10.030 Guideway: At-grade in mixed traffic	Lineal Miles of Guideway		\$ -	\$ -		
10.040 Guideway: Aerial structure	Lineal Miles of Guideway		\$ -	\$ -		
10.041 Bridges, Culverts, Drainage Improvements (Existing)	Square Feet of Structure	84000	\$ 550	\$ 46,200,000		
10.041 Bridges, Culverts, Drainage Improvements (New Sidings/Extensions)	Square Feet of Structure		\$ -	\$ -		
10.050 Guideway: Built-up fill	Lineal Miles of Guideway		\$ -	\$ -		
10.060 Guideway: Underground cut & cover	Lineal Miles of Guideway		\$ -	\$ -		
10.070 Guideway: Underground tunnel	Lineal Miles of Guideway		\$ -	\$ -		
10.080 Guideway: Retained cut or fill	Lineal Miles of Guideway		\$ -	\$ -		
10.090 Track: Direct fixation	Track Miles		\$ -	\$ -		
10.100 Track: Embedded	Track Miles		\$ -	\$ -		
10.110 Track: Ballasted	Track Miles		\$ -	\$ -		
10.111 Track: Ballasted, Rehabilitate (Mainline)	Track Miles	140	\$ 1,000,000	\$ 140,000,000		
10.112 Track: Ballasted (New Sidings/Extensions)	Track Miles		\$ -	\$ -		
10.113 Track: Ballasted, Rehabilitate (Sidings)	Track Miles		\$ -	\$ -		
10.114 Track: Ballasted, Curve Modification (Speed)	Track Miles	12	\$ 280,000	\$ 3,360,000		
10.115 Track: Ballasted, Industry Track Improvements/Adjustments (FTI)	Each		\$ -	\$ -		
10.120 Track: Special (higher speed switches, turnouts)	Each		\$ -	\$ -		
10.121 Track: Special (switches, turnouts)	Each		\$ -	\$ -		
10.130 Track: Vibration and noise dampening	Track Miles		\$ -	\$ -		
10.140 Special Structures	Lineal Miles of Guideway		\$ -	\$ -		
20 STATIONS, STOPS, TERMINALS, INTERMODAL				\$ -	0%	0%
20.010 At-grade station, stop, shelter, mall, terminal, platform	Stations		\$ -	\$ -		
20.020 Aerial station, stop, shelter, mall, terminal, platform	Stations		\$ -	\$ -		
20.030 Underground station, stop, shelter, mall, terminal, platform	Stations		\$ -	\$ -		
20.040 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	Stations		\$ -	\$ -		
20.050 Joint development	Stations		\$ -	\$ -		
20.060 Automobile parking multi-story structure	Stations		\$ -	\$ -		
20.070 Elevators, escalators	Number		\$ -	\$ -		
20.080 Passenger Overpass	Number		\$ -	\$ -		
20.090 Underground Interconnecting Tunnel	Number		\$ -	\$ -		
20.100 Signage and Graphics	Number		\$ -	\$ -		
30 SUPPORT FACILITIES				\$ -	0%	0%
30.010 Administration Building: Office, sales, storage, revenue counting	Number		\$ -	\$ -		
30.020 Light Maintenance Facility	Number		\$ -	\$ -		
30.030 Heavy Maintenance Facility	Number		\$ -	\$ -		
30.040 Storage or Maintenance of Way Building	Number		\$ -	\$ -		
30.050 Yard and Yard Track	Number		\$ -	\$ -		
40 SITEWORK & SPECIAL CONDITIONS				\$ 4,400,000	1%	1%
40.010 Demolition, Clearing, Earthwork	Lineal Miles of Guideway		\$ -	\$ -		
40.020 Site Utilities, Utility Relocation	Lineal Miles of Guideway		\$ -	\$ -		
40.030 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments	Lineal Miles of Guideway		\$ -	\$ -		
40.040 Environmental mitigation, e.g. wetlands, historic/archeologic, parks	Lineal Miles of Guideway		\$ -	\$ -		
40.050 Site structures including retaining walls, sound walls, fencing	Lineal Miles of Guideway		\$ -	\$ -		
40.060 Pedestrian / bike access and accommodation, landscaping	Lineal Miles of Guideway		\$ -	\$ -		
40.070 Automobile, bus, van accessways including roads, parking lots	Lineal Miles of Guideway		\$ -	\$ -		
40.071 Road Closures	Each		\$ -	\$ -		
40.072 Grade Crossings	Each	88	\$ 50,000	\$ 4,400,000		
40.073 Grade Separations	Each		\$ -	\$ -		
40.080 Temporary Facilities and other indirect costs during construction	Lineal Miles of Guideway		\$ -	\$ -		
50 SYSTEMS				\$ 122,550,000	39%	23%
50.010 Train control and signals	Track Miles	154	\$ 575,000	\$ 88,550,000		
50.020 Traffic signals and crossing protection	Each		\$ -	\$ -		
50.021 CWT gate system - Existing	Each	40	\$ 250,000	\$ 10,000,000		
50.022 CWT gate system - New	Each	48	\$ 500,000	\$ 24,000,000		
50.030 Traction power supply: substations	Track Miles		\$ -	\$ -		
50.040 Traction power distribution: catenary and third rail	Track Miles		\$ -	\$ -		
50.050 Communications	Lineal Miles of Guideway		\$ -	\$ -		
50.060 Fare collection system and equipment	Stations		\$ -	\$ -		
50.070 Central Control	Lineal Miles of Guideway		\$ -	\$ -		
CONSTRUCTION SUBTOTAL (10-50)				\$ 316,510,000	100%	60%
60 ROW, LAND, EXISTING IMPROVEMENTS				\$ -		0%
60.010 Purchase or lease of real estate	Lineal Miles of Guideway		\$ -	\$ -		
60.016 Unspecified	Lineal Miles of Guideway		\$ -	\$ -		
60.020 Relocation of existing households and businesses	Lineal Miles of Guideway		\$ -	\$ -		
80 PROFESSIONAL SERVICES (10-50)				\$ 88,625,000		17%
80.010 Preliminary Engineering			4.0%	\$ 12,661,000		
80.020 Final Design			8.0%	\$ 25,321,000		
80.030 Project Management for Design and Construction			3.0%	\$ 9,496,000		
80.040 Construction Administration & Management			8.0%	\$ 25,321,000		
80.050 Professional Liability and other Non-Construction Insurance			0.0%	\$ -		
80.060 Legal; Permits; Review Fees by other agencies, cities, etc.			0.0%	\$ -		
80.070 Surveys, Testing, Investigation, Inspection			5.0%	\$ 15,826,000		
80.080 Start up			0.0%	\$ -		
SUBTOTAL (10-80)				\$ 405,135,000		77%
90 UNALLOCATED CONTINGENCY	Total Amount		30%	\$ 121,541,000		23%
SUBTOTAL (10-90)				\$ 526,676,000		100%
100 FINANCE CHARGES	Total Amount					0%
TOTAL PROJECT COSTS (10-100)				\$ 526,676,000		100%

