



10th and 11th Street Corridor Traffic Impact Analysis

NICTD Double Track NWI (DT-NWI)
Milepost (MP) 58.8 to MP 32.2

Gary to Michigan City, IN

August 18, 2017



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NICTD Double Track-10th and 11th Street Corridor Traffic Impact Analysis

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List of Acronyms

Acronym	Definition
CSS	Chicago South Shore & South Bend Railroad
DHV	design hourly volume
HCS	Highway Capacity Software
LOS	level of service
mph	miles per hour
NICTD	Northern Indiana Commuter Transportation District
ROW	right-of-way
SSL	South Shore Line



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1.0 INTRODUCTION

This study addresses the traffic impacts of the Northern Indiana Commuter Transportation District's (NICTD's) installation of a second track on 10th Street and 11th Street within Michigan City. The South Shore Line (SSL) operates between Chicago, Illinois, and South Bend, Indiana, with 19 station stops along the line. In Michigan City, the NICTD/Chicago South Shore & South Bend (CSS) track runs down the middle of 10th Street from Sheridan Avenue on the west, to Huron Street on the east. The NICTD/CSS track runs down the middle of 11th Street from Tennessee Street on the west to Michigan Boulevard on the east. Twenty-nine commuter trains traverse Michigan City per weekday.

There are two passenger stations located in Michigan City: 11th Street/Michigan City Station and Carroll Avenue Station. The 11th Street/Michigan City Station is located on 11th Street between Franklin and Pine Streets (near the city center) next to the former South Shore Station building, and the Carroll Avenue Station is located at Carroll Avenue on the east side of Michigan City. These stations are located approximately 1.5 miles apart.

The proposed new NICTD/CSS tracks would follow the existing NICTD/CSS corridor along 10th and 11th Streets from Sheridan Avenue to the Carroll Avenue Yard. Two new tracks would be constructed to the south of the existing 10th Street right-of-way (ROW), from Sheridan Avenue to Chicago Street and continue with two new tracks along the north side of the 11th Street ROW to Michigan Boulevard.

2.0 PROJECT HISTORY AND PRIOR STUDIES

In 2013, NICTD and Michigan City completed the *Michigan City/NICTD Rail Realignment Study* (NICTD and Michigan City 2013), a joint planning and engineering study to evaluate numerous alternatives that would eliminate the existing embedded, street-running track down the middle of 10th and 11th Streets through Michigan City.

Although NICTD and Michigan City shared the same goal of finding a new route, each had different reasons and rationale for supporting the proposed realignment. Michigan City's priorities were increased economic development opportunities, improved quality of life, and maintenance of access through town while NICTD's priorities were increased speed of travel, decreased maintenance costs, and increased reliability of service. There were also several shared expectations, including the desire for establishing a modern passenger station, improving overall safety for the community, and enhancing access to and from Chicago. The Central Corridor Alignment was selected as the preferred alternative. The preferred alternative would move the new NICTD/CSS railroad tracks completely out of 10th Street to the area immediately south of 10th Street and would connect to the new tracks positioned in the north half of 11th Street. A modern station would be located just east of Franklin Street.

3.0 EXISTING CONDITIONS

The existing land use within the Project Area is predominantly residential with some commercial parcels along the route. The NICTD/CSS railroad track is embedded within the pavement section of 10th Street from Sheridan Avenue to Huron Street and within the pavement section of 11th Street from Tennessee Street to Michigan Boulevard.

The existing conditions are depicted in **Exhibit 1**, located in **Appendix A**.

3.1 EXISTING ROADWAYS

Each road is described below, followed by a description of the intersection geometry and traffic controls.



3.1.1 10TH STREET

10th Street is an east-west roadway commencing at Sheridan Avenue on the west and terminating at Michigan Boulevard on the east. This section of 10th Street is classified as a local road and has a posted speed limit of 30 miles per hour (mph).

In general, 10th Street is approximately 34 feet wide, has two travel lanes (one in each direction), and has an embedded street-running track down the middle. Curb is present at the edge of pavement on each side of the roadway. On-street parking is permitted on both sides of the roadway. A 5-foot-wide sidewalk is present on both sides of the roadway, separated by a grass buffer strip.

Trucks are prohibited on 10th Street between Sheridan Avenue and Michigan Boulevard.

3.1.2 11TH STREET

11th Street is an east-west roadway commencing at Chicago Street on the west and terminating at Michigan Boulevard on the east. This section of 11th Street is classified as a major collector and has a posted speed limit of 30 mph.

In general, 11th Street is approximately 34 feet wide, has two travel lanes (one in each direction), and has an embedded street-running track down the middle. Curb is present at the edge of pavement on each side of the roadway. On-street parking is permitted (south side only) between Kentucky and Franklin Streets. A 5-foot-wide sidewalk is present on both sides of the roadway, separated by a grass buffer strip.

Trucks are prohibited on 11th Street between Chicago Street and Michigan Boulevard.

3.1.3 SHERIDAN AVENUE

Sheridan Avenue is a north-south roadway commencing near Woodlawn Avenue on the south and terminating at U.S. 12 on the north. This section of Sheridan Avenue is classified as a major collector and has a posted speed limit of 30 mph. Sheridan Avenue consists of two 13-foot-wide travel lanes, one in each direction. On-street parking is permitted on both sides of the street, and sidewalks are not present.

3.1.4 CARLON COURT

Carlton Court is a north-south roadway, running from 10th Street south approximately 475 feet and turning east toward Donnelly Street. This roadway is classified as a local road with an assumed speed limit of 25 mph, the local regulatory speed limit. In general, Carlton Court is approximately 19 feet wide and consists of two travel lanes (one in each direction) without defined shoulder or curb. On-street parking is permitted on both sides of the road, and sidewalks are not present.

3.1.5 DONNELLY STREET

Donnelly Street is a north-south roadway commencing at Green Street on the south and terminating at 10th Street on the north. Donnelly Street is classified as a local road and has a speed limit of 25 mph. Donnelly Street consists of two 12-foot-wide travel lanes, one in each direction. On-street parking is permitted on the northbound side of the road. A 5-foot-wide sidewalk is present on both sides of the curbed roadway.

3.1.6 WILLARD AVENUE

Willard Avenue is a north-south roadway commencing near the intersection of County Road 1100/Hitchcock Street and Green Street on the south and terminating at U.S. 12 on the north. Willard Avenue is classified as a minor arterial and has a speed limit of 30 mph. Willard Avenue consists of two 12-foot-wide travel lanes, one in each direction. Curb is present at the edge of pavement on each side of



the roadway. On-street parking is permitted on both sides of the road. A 5-foot-wide sidewalk is present on both sides of the roadway, separated by a grass buffer strip.

3.1.7 CLAIRE STREET

Claire Street is a north-south roadway commencing at Green Street on the south and terminating at 10th Street on the north. Claire Street is classified as a local road and has a speed limit of 25 mph. Claire Street consists of two 8-foot-wide travel lanes, one in each direction. On-street parking is permitted on the southbound side of the road. A 5-foot-wide sidewalk is present at the back of curb on both sides of the roadway.

3.1.8 CHICAGO STREET

Chicago Street is a north-south roadway commencing at County Road 1100/Hitchcock Street on the south and terminating at 8th Street on the north. Chicago Street is classified as a minor arterial and has a speed limit of 30 mph. Chicago Street consists of two 12-foot-wide travel lanes, one in each direction. On-street parking is not permitted. A 5-foot-wide sidewalk is present on the northbound side of the roadway, separated by a grass buffer strip. Neither defined shoulders nor curb are present.

3.1.9 KENTUCKY STREET

Kentucky Street is a north-south roadway commencing at Garfield Street on the south and terminating at 9th Street on the north. Kentucky Street is classified as a local road and has a speed limit of 25 mph. Kentucky Street is approximately 32 feet wide with two travel lanes, one in each direction. Curb is present at the edge of pavement on each side of the roadway. On-street parking is permitted on the northbound side of the road. A 5-foot-wide sidewalk is present on both sides of the roadway, separated by a grass buffer strip.

3.1.10 TENNESSEE STREET

Tennessee Street is a north-south roadway commencing at Garfield Street on the south and terminating at 8th Street on the north. Tennessee Street is classified as a local road and has a speed limit of 25 mph. Tennessee Street is approximately 30 feet wide with two travel lanes, one in each direction. Curb is present at the edge of pavement on each side of the roadway. On-street parking is permitted on both sides of the road. A 5-foot-wide sidewalk is present on both sides of the roadway, separated by a grass buffer strip.

3.1.11 OHIO STREET

Ohio Street is a north-south roadway commencing at Kieffer Road on the south and terminating at 8th Street on the north. Ohio Street is classified as a major collector and has a speed limit of 30 mph. Ohio Street is approximately 40 feet wide with two travel lanes, one in each direction. Curb is present at the edge of pavement on each side of the roadway. On-street parking is permitted on both sides of the road. A 5-foot-wide sidewalk is present on both sides of the roadway, separated by a grass buffer strip.

3.1.12 ELSTON STREET

Elston Street is a north-south roadway commencing at Arthur Street on the south and terminating at 8th Street on the north. Elston Street is classified as a local road and has a speed limit of 30 mph. Elston Street is approximately 30 feet wide with one northbound travel lane. Curb is present at the edge of pavement on each side of the roadway. On-street parking is permitted on both sides of the road. A 5-foot-wide sidewalk is present on both sides of the roadway separated by a grass buffer strip.



3.1.13 MANHATTAN STREET

Manhattan Street is a north-south roadway commencing at Arthur Street on the south and terminating at 10th Street on the north. Manhattan Street is classified as a local road and has a speed limit of 25 mph. Manhattan Street is approximately 30 feet wide with one southbound travel lane. Curb is present at the edge of pavement on each side of the roadway. On-street parking is permitted on both sides of the road. A 5-foot-wide sidewalk is present at the back of curb on both sides of the roadway.

3.1.14 BUFFALO STREET

Buffalo Street is a north-south roadway commencing near Ripley Street on the south and terminating at 10th Street on the north. Buffalo Street is classified as a local road and has a speed limit of 25 mph. Buffalo Street is approximately 30 feet wide with one northbound travel lane. Curb is present at the edge of pavement on each side of the roadway. On-street parking is permitted on both sides of the road. A 5-foot-wide sidewalk is present on both sides of the roadway, separated by a grass buffer strip on the east side of the road and present at the back of curb on the west side of the roadway.

3.1.15 WABASH STREET

Wabash Street is a north-south roadway commencing near Southwood Drive on the south and terminating near 2nd Street on the north. Wabash Street is classified as a major collector and has a posted speed limit of 30 mph. Wabash Street is approximately 60 feet wide with four travel lanes, two in each direction. Curb is present at the edge of pavement on each side of the roadway. On-street parking is not permitted. A 5-foot-wide sidewalk is present at the back of curb on both sides of the roadway.

3.1.16 WASHINGTON STREET

Washington Street is a north-south roadway commencing near Skwiat Legion Avenue on the south and terminating near 2nd Street on the north. Washington Street is classified as a local road and has a posted speed limit of 30 mph. North of 11th Street, Washington Street is approximately 45 feet wide with two travel lanes, one in each direction. South of 11th Street, Washington Street is approximately 30 feet wide with two travel lanes, one in each direction. Curb is present at the edge of pavement on each side of the roadway. North of 11th Street, on-street parking is permitted on both sides of the road; however, south of 11th Street, parking is permitted on the northbound side only. A 5-foot-wide sidewalk is present on both sides of the roadway, separated by a grass buffer strip.

3.1.17 FRANKLIN STREET

Franklin Street is a north-south roadway commencing near Kieffer Road on the south and terminating at 4th Street on the north. Franklin Street is classified as other principal arterial and has a posted speed limit of 30 mph. This section of Franklin Street is approximately 65 feet wide with four travel lanes, two in each direction. Curb is present at the edge of pavement on each side of the roadway. On-street parking is permitted on both sides of the road. A 5-foot-wide sidewalk is present on both sides of the roadway, separated by a grass buffer strip.

3.1.18 PINE STREET

Pine Street is a north-south roadway commencing near Barker Avenue on the south and terminating at 2nd Street on the north. Pine Street is classified as a local road and has a speed limit of 25 mph. South of 11th Street, Pine Street is approximately 30 feet wide with two travel lanes, one in each direction. North of 11th Street, Pine Street is approximately 45 feet wide with two northbound travel lanes. Curb is present at the edge of pavement on each side of the roadway. On-street parking is permitted on both sides of the road. A 7-foot-wide sidewalk is present at the back of curb on both sides of the roadway north of 11th Street. A 5-foot-wide sidewalk is located south of 11th Street, separated by a grass buffer strip.

3.1.19 SPRING STREET

Spring Street is a north-south roadway commencing near Detroit Street on the south and terminating at 5th Street on the north. Spring Street is classified as a local road and has a speed limit of 25 mph. Spring Street is approximately 35 feet wide with two travel lanes, one in each direction. Curb is present at the edge of pavement on each side of the roadway. On-street parking is permitted on both sides of the road. A 5-foot-wide sidewalk is present on both sides of the roadway, separated by a grass buffer strip on the east side of the road.

3.1.20 CEDAR STREET

Cedar Street is a north-south roadway commencing near Detroit Street on the south and terminating at 5th Street on the north. Cedar Street is classified as a local road and has a speed limit of 25 mph. Cedar Street is approximately 28 feet wide with two travel lanes, one in each direction. Curb is present at the edge of pavement on each side of the roadway. On-street parking is permitted on the east side of the road. A 7-foot-wide sidewalk is present at the back of curb on both sides of the roadway.

3.1.21 LAFAYETTE STREET

Lafayette Street is a north-south roadway commencing near Greenwood Avenue on the south and terminating at 8th Street on the north. Lafayette Street is classified as a local road and has a speed limit of 25 mph. Lafayette Street is approximately 28 feet wide with two travel lanes, one in each direction. Curb is present at the edge of pavement on each side of the roadway. North of 11th Street, on-street parking is permitted on the northbound side only; however, south of 11th Street, parking is permitted on the southbound side only. A 5-foot-wide sidewalk is present on both sides of the roadway, separated by a grass buffer strip.

3.1.22 YORK STREET

York Street is a north-south roadway commencing near Arthur Street on the south and terminating at 8th Street on the north. York Street is classified as a local road and has a speed limit of 25 mph. York Street is approximately 20 feet wide with two travel lanes, one in each direction. Curb is present at the edge of pavement on each side of the roadway. On-street parking is permitted on both sides of the road. A 5-foot-wide sidewalk is present on both sides of the roadway, separated by a grass buffer strip.

3.1.23 OAK STREET

Oak Street is a north-south roadway commencing at Arthur Street on the south and terminating at 8th Street on the north. Oak Street is classified as a local road and has a speed limit of 25 mph. Oak Street is approximately 30 feet wide with two travel lanes, one in each direction. On-street parking is permitted on the both sides of the road. Sidewalk is not present along the roadway. Neither shoulders nor curb are present.

3.1.24 MAPLE STREET

Maple Street is a north-south roadway commencing at Barker Avenue on the south and terminating at Michigan Boulevard on the north. Maple Street is classified as a local road and has a speed limit of 25 mph. Maple Street is approximately 30 feet wide with two travel lanes, one in each direction. Curb is present at the edge of pavement on each side of the roadway. On-street parking is permitted on both sides of the road. A 5-foot-wide sidewalk is present on the east side of the roadway north of 11th Street. Neither shoulders nor curb are present.



3.1.25 MICHIGAN BOULEVARD

Michigan Boulevard is an east-west roadway that traverses the Project Area. Michigan Boulevard is classified as other principal arterial and has a posted speed limit of 35 mph. Michigan Boulevard is a 75-foot-wide divided roadway with four travel lanes, two in each direction. Curb is present at the edge of pavement on each side of the roadway. On-street parking is permitted on the westbound side of the road. On-street bike lanes are present on both sides of the road. A 5-foot-wide sidewalk is present on both sides of the roadway, separated by a grass buffer strip.

3.2 EXISTING CROSS STREETS AND INTERSECTIONS

Several intersections, as well as numerous residential and commercial drives, occur within the Project Area. The following intersections are being examined for possible intersection improvements.

3.2.1 10TH STREET AND SHERIDAN AVENUE

The current configuration of 10th Street and Sheridan Avenue is a “T” intersection, with Sheridan Avenue being the through roadway. Due to the NICTD/CSS railroad track bisecting the intersection, Sheridan Avenue is stop controlled. The SSL continues west along the same alignment. Flashing warning lights are located in the northwest and southeast quadrants, facing Sheridan Avenue. NICTD’s maintenance-of-way drive is located approximately 50 feet north of the intersection.

3.2.2 10TH STREET AND CARLON COURT

The current configuration of 10th Street and Carlon Court is a skewed “T” intersection, with 10th Street being the through roadway and Carlon Court being stop controlled. The NICTD/CSS railroad track is located along the centerline of 10th Street. A crossbuck sign is located on Carlon Court.

3.2.3 10TH STREET AND DONNELLY STREET

The current configuration of 10th and Donnelly Streets is a skewed “T” intersection, with 10th Street being the through roadway and Donnelly Street being stop controlled. The NICTD/CSS railroad track is located along the centerline of 10th Street. A crossbuck sign is located on Donnelly Street.

3.2.4 10TH STREET AND WILLARD AVENUE

The current configuration of 10th Street and Willard Avenue is a skewed four-legged intersection, with stop control only on Willard Avenue. The NICTD/CSS railroad track bisects the intersection, running east-west along the centerline of 10th Street. Flashing warning lights are located in the northwest and southeast quadrants, facing Willard Avenue.

3.2.5 10TH STREET AND CLAIRE STREET

The current configuration of 10th and Claire Streets is a skewed “T” intersection, with 10th Street being the through roadway, and Claire Street being stop controlled. The NICTD/CSS railroad track is located along the centerline of 10th Street. A crossbuck sign is located on Claire Street.

3.2.6 10TH STREET, CHICAGO STREET, AND KENTUCKY STREET

The current configuration of Chicago, Kentucky, and 10th Streets is an offset six-legged intersection. The intersection of Chicago and Kentucky Streets is two-way stop controlled, with Chicago Street as the through street. The intersection of Kentucky and 10th Streets is two-way stop controlled, with 10th Street as the uncontrolled movement. The intersection of 10th and Chicago Streets is two-way stop controlled, with Chicago Street as the through street.



3.2.7 11TH STREET AND CHICAGO STREET

The current configuration of Chicago and 11th Streets is a skewed “T” intersection, with Chicago Street as the through street. A crossbuck sign is located on Chicago Street. An existing NICTD/CSS railroad-highway at-grade crossing is located approximately 200 feet northeast of the intersection.

3.2.8 11TH STREET AND KENTUCKY STREET

The current configuration of 11th and Kentucky Streets is a four-legged intersection, with stop control only on Kentucky Street. An existing NICTD/CSS railroad-highway at-grade crossing is located approximately 85 feet north of the intersection. Commercial driveways are located in the northwest and southwest quadrants of the intersection.

3.2.9 11TH STREET AND TENNESSEE STREET

The current configuration of 11th and Tennessee Streets is a four-legged intersection, with stop control only on Tennessee Street. The NICTD/CSS railroad track bisects the intersection, running east-west along the centerline of 11th Street. Crossbuck signs are located on Tennessee Street.

3.2.10 11TH STREET AND OHIO STREET

The current configuration of 11th and Ohio Streets is a four-legged intersection, with stop control only on Ohio Street. The NICTD/CSS railroad track bisects the intersection, running east-west along the centerline of 11th Street. Crossbuck signs are located on Ohio Street.

3.2.11 11TH STREET AND ELSTON STREET

The current configuration of 11th and Elston Streets is a four-legged intersection, with stop control only on Elston Street. The NICTD/CSS railroad track bisects the intersection, running east-west along the centerline of 11th Street. A crossbuck sign is located on the south approach of Ohio Street, which is a one-way northbound street.

3.2.12 11TH STREET AND MANHATTAN STREET

The current configuration of 11th and Manhattan Streets is a four-legged intersection, with stop control only on Manhattan Street. The NICTD/CSS railroad track bisects the intersection, running east-west along the centerline of 11th Street. A crossbuck sign is located on the north approach of Manhattan Street, which is a one-way southbound street.

3.2.13 11TH STREET AND BUFFALO STREET

The current configuration of 11th and Buffalo Streets is a four-legged intersection, with stop control only on Buffalo Street. The NICTD/CSS railroad track bisects the intersection, running east-west along the centerline of 11th Street. A crossbuck sign is located on the south approach of Buffalo Street, which is a one-way northbound street.

3.2.14 11TH STREET AND WABASH STREET

The current configuration of Wabash and 11th Streets is a four-way signalized intersection, with dedicated left-turn lanes (Wabash Street) and a dedicated right-turn lane for southbound (Wabash Street) traffic turning west onto 11th Street. The NICTD/CSS railroad track bisects the intersection, running east-west along the centerline of 11th Street. Traffic signal sequences are preempted by approaching trains. Crossbuck signs are located on Wabash Street.



3.2.15 11TH STREET AND WASHINGTON STREET

The current configuration of Washington and 11th Streets is a four-way signalized intersection, with a dedicated right-turn lane for northbound (Washington Street) traffic turning east onto 11th Street. The NICTD/CSS railroad track bisects the intersection, running east-west along the centerline of 11th Street. Traffic signal sequences are preempted by approaching trains. Crossbuck signs are located on Washington Street.

3.2.16 11TH STREET AND FRANKLIN STREET

The current configuration of Franklin and 11th Streets is a four-way signalized intersection. The NICTD/CSS railroad track bisects the intersection, running east-west along the centerline of 11th Street. Traffic signal sequences are preempted by approaching trains. Crossbuck signs are located on Franklin Street.

3.2.17 11TH STREET AND PINE STREET

The current configuration of 11th and Pine Streets is a four-legged intersection, with stop control only on Pine Street. The NICTD/CSS railroad track bisects the intersection, running east-west along the centerline of 11th Street. The 11th Street/Michigan City Station is located in the northwest quadrant of this intersection. A traffic signal is used to stop westbound (11th Street) traffic, and a message sign is used to warn southbound (Pine Street) traffic during passenger boarding and alighting. Crossbuck signs are located on Pine Street.

3.2.18 11TH STREET AND SPRING STREET

The current configuration of 11th and Spring Streets is a four-legged intersection with stop control only on Spring Street. The NICTD/CSS railroad track bisects the intersection, running east-west along the centerline of 11th Street. Crossbuck signs are located on Spring Street.

3.2.19 11TH STREET AND CEDAR STREET

The current configuration of 11th and Cedar Streets is a skewed four-legged intersection, with stop control only on Cedar Street. The intersection is located within the existing reverse curve on 11th Street. The NICTD/CSS railroad track crosses the intersection, running east-west along 11th Street. Crossbuck signs are located on Cedar Street.

3.2.20 11TH STREET AND LAFAYETTE STREET

The current configuration of 11th and Lafayette Streets is a skewed four-legged intersection, with stop control only on Lafayette Street. The intersection is located within the existing reverse curve on 11th Street. The NICTD/CSS railroad track crosses the intersection, running east-west along 11th Street. Crossbuck signs are located on Lafayette Street.

3.2.21 11TH STREET AND YORK STREET

The current configuration of 11th and York Streets is a four-legged intersection, with stop control only on York Street. The NICTD/CSS railroad track bisects the intersection, running east-west along 11th Street. Crossbuck signs are located on York Street.

3.2.22 11TH STREET AND OAK STREET

The current configuration of 11th and Oak Streets is a four-legged intersection, with stop control only on Oak Street. The NICTD/CSS railroad track bisects the intersection, running east-west along 11th Street. Crossbuck signs are located on Oak Street.



3.2.23 11TH STREET AND MAPLE STREET

The current configuration of 11th and Maple Streets is a four-legged intersection, with stop control only on Maple Street. The NICTD/CSS railroad track bisects the intersection, running east-west along 11th Street. Crossbuck signs are located on Maple Street.

3.2.24 11TH STREET AND MICHIGAN BOULEVARD

The current configuration of 11th Street and Michigan Boulevard is a four-legged channelized intersection, with 11th Street under stop control. NICTD/CSS railroad track bisects the intersection, running east-west along 11th Street. The track separates the eastbound through-left lane from the exclusive right-turn lane on 11th Street.

3.3 TRAFFIC DATA

NICTD collected traffic volumes throughout the Project Area using automatic traffic counters on August 2–4 and 9, 2016; October 11–13 and 18–20, 2016. The existing traffic volumes are shown in **Exhibit 1** included in **Appendix A**.

An operational analysis of traffic data was only conducted for the future build condition. The City of Michigan City has not informed NICTD of any operational deficiencies under existing conditions; therefore, only future conditions were evaluated to determine if an operational deficiency would occur. The future traffic operations are discussed under **Section 4.3**.

3.4 CRASH DATA AND ANALYSIS

Crash data within the Project Area were obtained for 2013 through 2015. The crash data were analyzed in the *Crash Summary Report* (HDR and Patrick Engineering 2017).

4.0 FUTURE CONDITIONS

4.1 DESIGN STANDARDS

Table 4-1 and **Table 4-2** outline the proposed design standards for improvements within the Project Area.

Table 4-1. 10th Street Design Criteria

10 th Street Design Criteria	
Functional Classification	Urban Local Road
Project Scope of Work	3R Non-Freeway
IDM Design Manual Location	55-3H
Design Speed	35 mph
Posted Speed	30 mph
Travel Lane Width	Des.: 10 ft.; Min.: 9 ft.
Auxiliary Lane Width	Des.: 11 ft.; Min.: 9 ft.
Parking Lane Width	Des.: 9 ft.; Min.: 7 ft.
Curb Offset	Des.: 2 ft.; Min.: 1 ft.
Sidewalk Width	Des.: 6 ft.; Min.: 4 ft.
Bicycle-Lane Width	5 ft. (Curbed)
Clear Zone Width	10 ft. (Curbed)
Stopping Sight Distance	250 ft.
Minimum Radius ($e_{\max} = 4\% / 6\%$)	371 ft. / 340 ft.
Superelevation Rate	Up to $e_{\max} = 6\%$
Vertical Curve (K Values)	Crest: See Sect. 55-4.04; Sag: 27
Maximum Grade	9%
Minimum Grade	Des.: 0.5%; Min.: 0.3%

Table 4-2. 11th Street Design Criteria

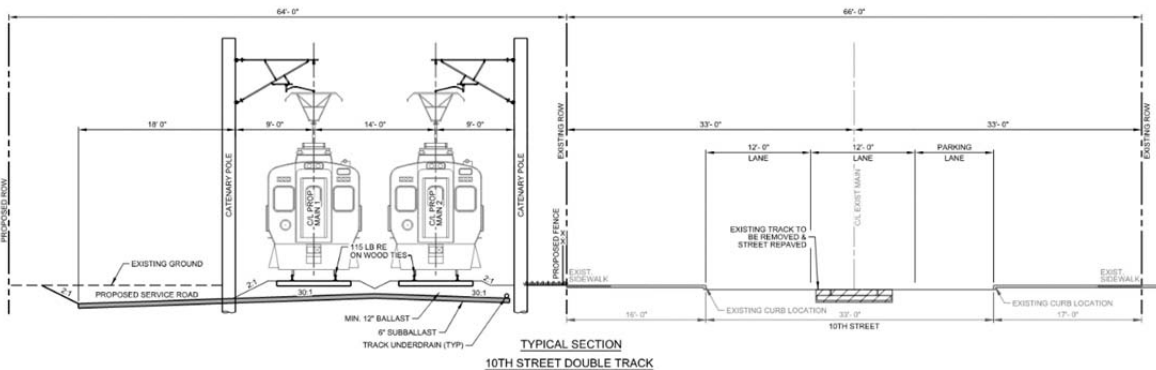
11 th Street Design Criteria	
Functional Classification	Urban Collector
Project Scope of Work	4R Full Reconstruction
IDM Design Manual Location	53-8
Design Speed	35 mph
Posted Speed	30 mph
Travel Lane Width	Des.: 12 ft.; Min.: 10 ft.
Auxiliary Lane Width	Des.: 12 ft.; Min.: 10 ft.
Parking Lane Width	Des.: 11 ft.; Min.: 8 ft.
Curb Offset	2 ft.
Sidewalk Width	Varies; Min.: 6 ft.
Bicycle-Lane Width	5 ft. (Curbed)
Clear Zone Width	10 ft. (Curbed)
Stopping Sight Distance	250 ft.
Minimum Radius ($e_{\max} = 4\% / 6\%$)	430 ft. / 400 ft.
Superelevation Rate	Up to $e_{\max} = 6\%$
Vertical Curve (K Values)	Crest: 29; Sag: 49
Maximum Grade	9%
Minimum Grade	Des.: 0.5%; Min.: 0.3%

4.2 PROPOSED ROADWAY IMPROVEMENTS

4.2.1 10TH STREET

The proposed Project would eliminate the existing embedded street-running track by constructing two new tracks south of the existing 10th Street ROW. The existing street-running track would be removed and 10th Street would be repaved. The typical section for the roadway would remain 34 feet wide and consist of two 12-foot-wide travel lanes (one in each direction), with a 9-foot-wide parking lane on the westbound side of the roadway. Curb would remain at the edge of pavement on each side of the roadway (**Figure 4-1**).

Figure 4-1. 10th Street Typical Section



Both Sheridan and Willard Avenues would continue as north-south through streets across the new NICTD/CSS alignment. Carlon Court and Donnelly Street would access Willard Avenue to connect into 10th Street. Similarly, Claire Street would access either Willard Avenue or Chicago Street to connect into 10th Street.

4.2.2 11TH STREET

Two new NICTD/CSS railroad tracks would be constructed in the north half of the 11th Street corridor between Kentucky Street and Michigan Boulevard. The southern half of the corridor would be open to one-way eastbound vehicular traffic. Vehicles wishing to travel west would traverse up to 10th Street. All existing streets that connect into 11th Street from the south would remain open. The following streets would continue to have access across the newly aligned NICTD/CSS railroad tracks:

- Ohio Street
- Wabash Street
- Washington Street
- Franklin Street
- Lafayette Street
- Oak Street
- Michigan Boulevard

The following streets would be closed to through traffic and would not cross the newly aligned NICTD/CSS railroad tracks:

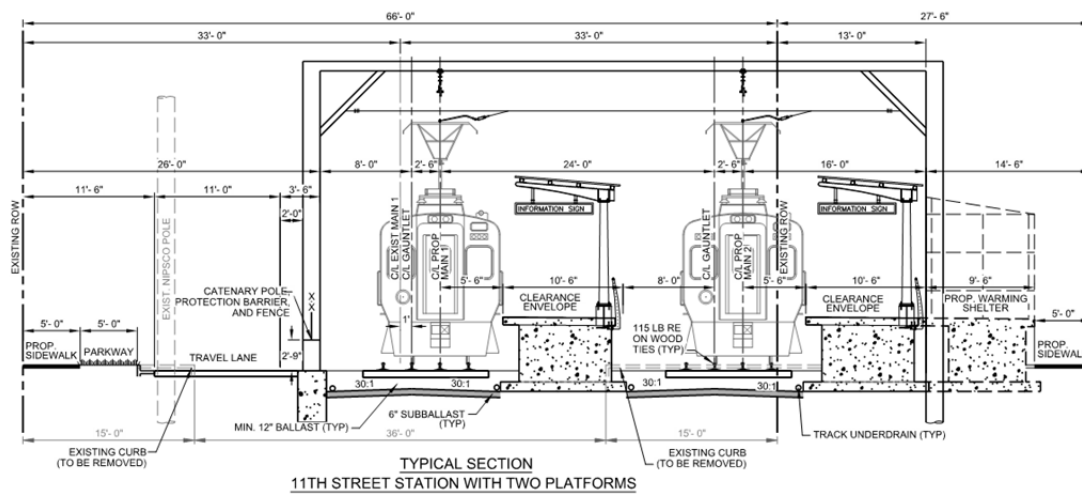
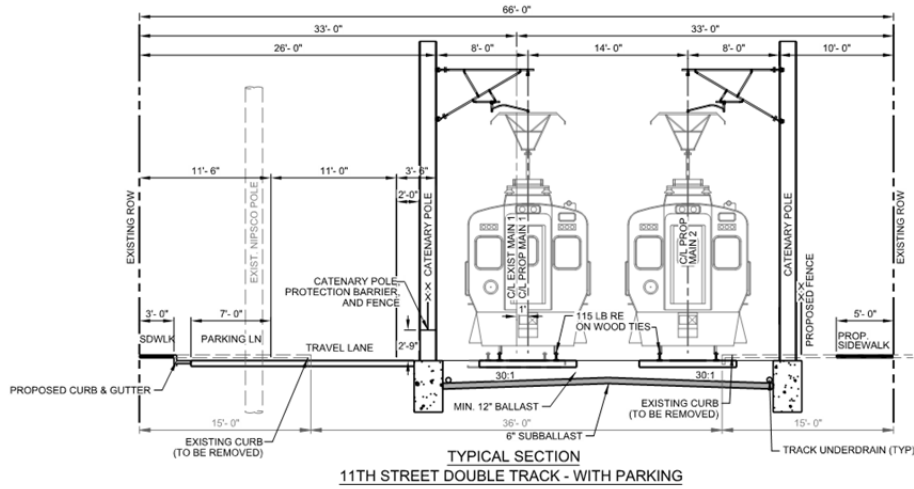
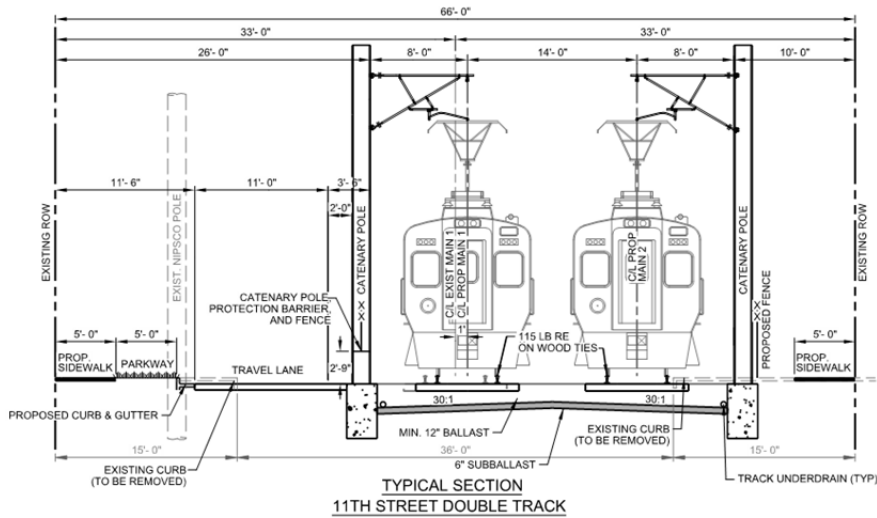
- Kentucky Street
- Tennessee Street
- Elston Street
- Manhattan Street



- Buffalo Street
- Pine Street
- Spring Street
- Cedar Street
- York Street
- Maple Street

Proposed improvements to the 11th Street/Michigan City Station would be constructed east of Franklin Street. A proposed typical section for this area is shown in **Figure 4-2**.

Figure 4-2. 11th Street Typical Section



4.3 PROPOSED INTERSECTION IMPROVEMENTS

The final design and construction of any proposed improvements listed in the following sections, other than those listed for 10th and 11th Streets, would be implemented by the City of Michigan City. At all road closures north of the proposed Project, a protective barrier wall would be constructed to prohibit pedestrians from crossing the tracks at locations other than at designated crossings.

In the following figure excerpts from the roadway plan, the red lines represent the proposed centerline of tracks and the grey shaded areas represent a rail service road.

4.3.1 10TH STREET AND CARLON COURT; 10TH STREET AND DONNELLY STREET; 10TH STREET AND CLAIRE STREET

In an effort to increase safety, NICTD proposes consolidation of closely spaced at-grade railroad crossings, including Carlon Court, Donnelly Street, and Claire Street. To maintain traffic circulation (particularly for municipal services), new local road segments would be constructed south of and parallel to 10th Street between Carlon Court and the existing alleyway located approximately 130 feet east of Carlon Court, as well as between Donnelly Street and the existing alleyway located approximately 140 feet east of Donnelly Street (**Figure 4-3**). The cross section for the new roadways would consist of two 10-foot-wide travel lanes, one in each direction. Motorists would utilize Willard Avenue to access 10th Street. Similarly, Claire Street would be closed south of 10th Street. Motorists would utilize either Willard Avenue or Chicago Street to access 10th Street.

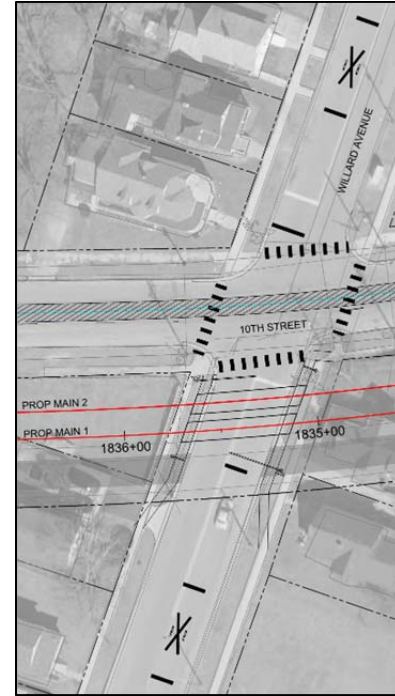
Figure 4-3. Proposed Improvements at the Intersection of 10th Street with Carlon Court and Donnelly Street



4.3.2 10TH STREET AND WILLARD AVENUE

The intersection of 10th Street and Willard Avenue would remain a cross intersection. Willard Avenue would remain open across the tracks and continue to operate under two-way stop control. Crossbucks, flashing warning lights, and gates would be located in the northwest and southeast quadrants of the crossing, facing Willard Avenue (**Figure 4-4**).

Figure 4-4. Proposed Improvements at the Intersection of 10th Street and Willard Avenue

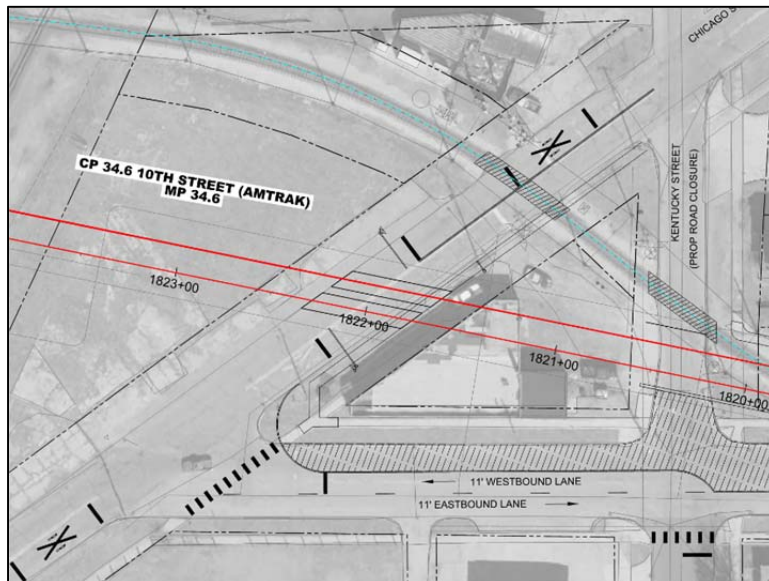


4.3.3 11TH STREET AND CHICAGO STREET; 11TH STREET AND KENTUCKY STREET

The intersection of Chicago and 11th Streets would maintain the same alignment and configuration as a “T” intersection. The east leg of the intersection would remain stop controlled only on 11th Street. A new SSL railroad-highway at-grade crossing would be located approximately 145 feet north of the intersection. Pedestrian accommodations would remain at this location (**Figure 4-5**).

The intersection of 11th and Kentucky Streets would be reconfigured to a “T” intersection as the north leg would be closed across the tracks. Southbound vehicles and pedestrians can use either Chicago or Ohio Streets to access 11th Street. The south leg of the intersection would remain stop controlled only on Kentucky Street (**Figure 4-5**).

Figure 4-5. Proposed Improvements at the Intersection of 11th Street with Chicago and Kentucky Streets



4.3.4 11TH STREET AND TENNESSEE STREET

The intersection of 11th and Tennessee Streets would be reconfigured to a “T” intersection as the north leg would be closed across the tracks. Southbound vehicles would use either Chicago or Ohio Streets to access 11th Street. The south leg of the intersection would operate as a right-in/right-out intersection with stop control only on Tennessee Street (**Figure 4-6**). To maintain traffic circulation (particularly for municipal services), Tennessee Street (north of 11th Street) would be connected via a shared 10-foot-wide roadway to the alleyway east and west of Tennessee Street.

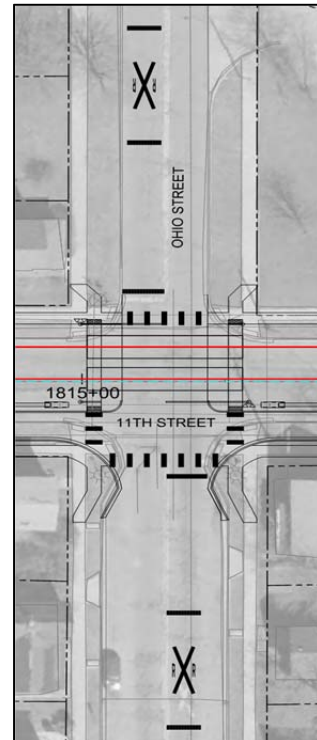
Figure 4-6. Proposed Improvements at the Intersection of 11th and Tennessee Streets



4.3.5 11TH STREET AND OHIO STREET

The intersection of 11th and Ohio Streets would remain a cross intersection, with 11th Street restricted to one-way travel in the eastbound direction. Ohio Street would remain open across the tracks and continue to operate under two-way stop control. Crossbucks, flashing warning lights, and gates would be located in the northwest, southwest, and southeast quadrants, facing Ohio Street (**Figure 4-7**).

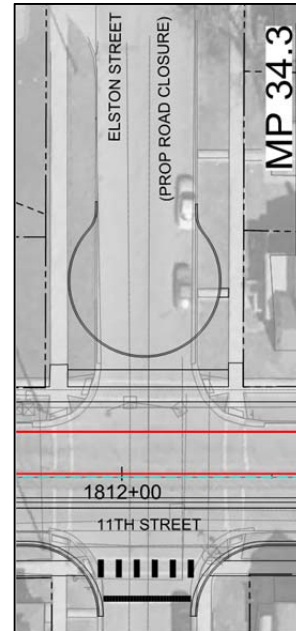
Figure 4-7. Proposed Improvements at the Intersection of 11th and Ohio Streets



4.3.6 11TH STREET AND ELSTON STREET

To increase safety, NICTD proposes consolidation of closely spaced crossings, including Elston, Manhattan, and Buffalo Streets. The intersection of 11th Street and Elston Street would be reconfigured to a “T” intersection as the north leg would be closed across the tracks. Elston Street would be converted to a two-way roadway between 11th and 10th Streets and a cul-de-sac would be installed at the northern edge of 11th Street. The south leg of the intersection would operate as a right-out intersection with stop control only on Elston Street (**Figure 4-8**).

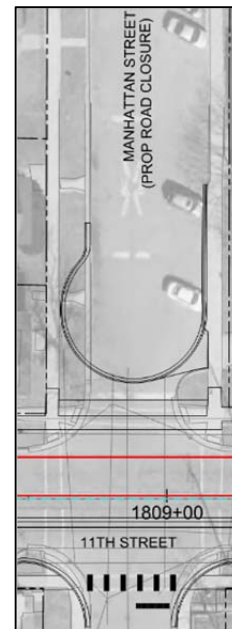
Figure 4-8. Proposed Improvements at the Intersection of 11th and Elston Streets



4.3.7 11TH STREET AND MANHATTAN STREET; 11TH STREET AND BUFFALO STREET

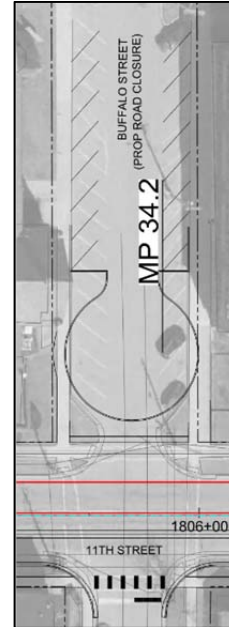
As previously indicated, NICTD proposes consolidation of closely spaced crossings, including Manhattan and Buffalo Streets. The intersection of 11th and Manhattan Streets would be reconfigured to a “T” intersection as the north leg would be closed across the tracks. Manhattan Street would be converted to a two-way roadway between 11th and 10th Streets and a cul-de-sac would be installed at the northern edge of 11th Street. The south leg of the intersection would operate as a right-in/right-out intersection, with stop control only on Manhattan Street (**Figure 4-9**).

Figure 4-9. Proposed Improvements at the Intersection of 11th and Manhattan Streets



Similarly, the intersection of 11th and Buffalo Streets would be reconfigured to a “T” intersection as the north leg would be closed across the tracks. Buffalo Street would be converted to a two-way roadway between 11th and 10th Streets and a cul-de-sac would be installed at the northern edge of 11th Street. The existing on-street parking would be reconfigured to accommodate two-way traffic. The south leg of the intersection would operate as a right-in/right-out intersection with stop control only on Buffalo Street (**Figure 4-10**).

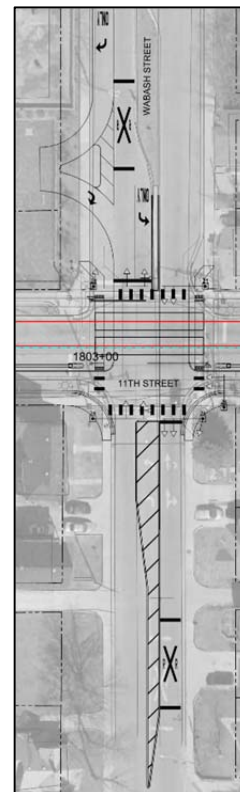
Figure 4-10. Proposed Improvements at the Intersection of 11th and Buffalo Streets



4.3.8 11TH STREET AND WABASH STREET

The intersection of Wabash and 11th Streets would remain a cross intersection with 11th Street restricted to one-way eastbound travel. Wabash Street would remain open across the tracks and continue to operate as a signalized intersection. The cross section for the roadway would remain a divided roadway, with one 12-foot-wide northbound travel lane and one 12-foot-wide southbound travel lane and auxiliary left-lane. The northbound left-turn lane would be eliminated and a right-in/right-out access to the parking lot for the Marquette School would be installed. Pedestrian accommodations would also be installed at this location. The existing traffic signal at this location would be updated to accommodate the proposed roadway layout and operations. Crossbucks, flashing warning lights, and gates would be located in the northwest, southwest, and southeast quadrants, facing Wabash Street (**Figure 4-11**).

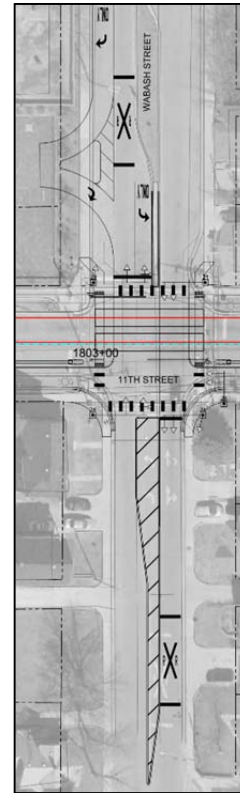
Figure 4-11. Proposed Improvements at the Intersection of 11th and Wabash Streets



4.3.9 11TH STREET AND WASHINGTON STREET

The intersection of Washington and 11th Streets would remain a cross intersection with 11th Street restricted to one-way eastbound travel. Washington Street would remain open across the tracks and continue to operate as a signalized intersection. The cross section for the roadway would consist of one 12-foot-wide northbound travel lane, and one 12-foot-wide southbound travel lane. The northbound left-turn lane would be eliminated due to 11th Street becoming one-way eastbound. Pedestrian accommodations would also be installed at this location. The existing traffic signal at this location would be updated to accommodate the proposed roadway layout and operations. Crossbucks, flashing warning lights, and gates would be located in the northwest, southwest, and southeast quadrants, facing Washington Street (**Figure 4-12**).

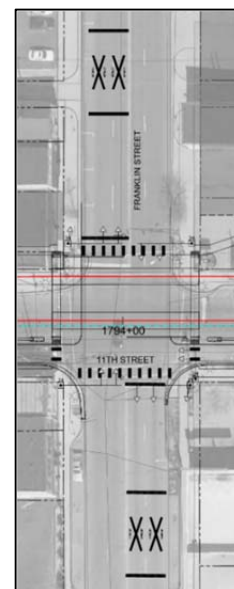
Figure 4-12. Proposed Improvements at the Intersection of 11th and Wabash Streets



4.3.10 11TH STREET AND FRANKLIN STREET

The intersection of Franklin Street and 11th Street would remain a cross intersection with 11th Street restricted to one-way travel in the eastbound direction. Franklin Street would remain open across the tracks and continue to operate as a signalized intersection. The cross section for the roadway would consist of two 12-foot-wide travel lanes northbound and two 12-foot-wide travel lanes southbound. Pedestrian accommodations would be installed at this location. The proposed location of the improved 11th Street/Michigan City Station would be directly east of this intersection. The existing traffic signal at this location would be updated to accommodate the proposed roadway layout and operations. Crossbucks, flashing warning lights, and gates would be located in the northwest, southwest, and southeast quadrants, facing Franklin Street (**Figure 4-13**).

Figure 4-13. Proposed Improvements at the Intersection of 11th and Franklin Streets



4.3.11 11TH STREET AND PINE STREET; 11TH STREET AND SPRING STREET

To accommodate the proposed high-level platforms at the improved 11th Street/Michigan City Station, NICTD proposes consolidation of closely spaced crossings, including Pine and Spring Streets. The intersection of 11th and Pine Streets, as well as 11th and Spring Streets, would be reconfigured to a “T” intersection as the north legs would be closed across the tracks. North of 11th Street, Pine and Spring Streets would remain two-way roadways and serve the proposed 11th Street/Michigan City Station parking garage and/or surface lots. The south legs of both intersections would operate as a right-in/right-out intersection, with stop control only on the minor roadway (i.e., Pine and Spring Streets) (**Figure 4-14**).

Figure 4-14. Proposed Improvements at the Intersection of 11th Street with Pine Street and Spring Street



4.3.12 11TH STREET AND CEDAR STREET

To increase safety, NICTD proposes consolidation of closely spaced crossings, including Cedar Street. The intersection of 11th and Cedar Streets would be reconfigured to a “T” intersection as the north leg would be closed across the tracks. Cedar Street would remain a two-way roadway and serve the proposed 11th Street/Michigan City Station parking garage and/or surface lots. The south leg of the intersection would operate as a right-in/right-out intersection, with stop control only on Cedar Street (**Figure 4-15**).

Figure 4-15. Proposed Improvements at the Intersection of 11th and Cedar Streets



4.3.13 11TH STREET AND LAFAYETTE STREET

The intersection of 11th and Lafayette Streets would remain a cross intersection with 11th Street restricted to one-way eastbound travel. Lafayette Street would remain open across the tracks and continue to operate under two-way stop control, and would consist of two 12-foot-wide travel lanes, one in each direction. Pedestrian accommodations would also be installed at this location. Crossbucks, flashing warning lights, and gates would be located in the northwest, southwest, and southeast quadrants, facing Lafayette Street (**Figure 4-16**).

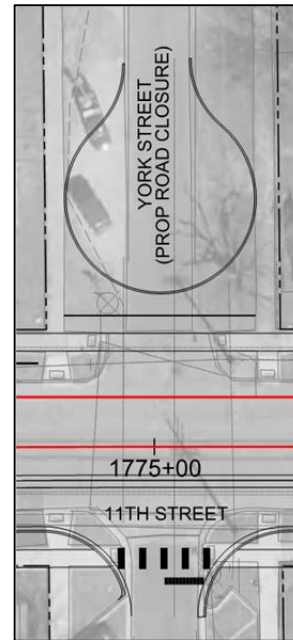
Figure 4-16. Proposed Improvements at the Intersection of 11th and Lafayette Streets



4.3.14 11TH STREET AND YORK STREET

As previously indicated, NICTD proposes consolidation of closely spaced crossings, including York Street. The intersection of 11th and York Streets would be reconfigured to a “T” intersection as the north leg would be closed across the tracks. York Street would remain a two-way roadway with a cul-de-sac installed at the northern edge of 11th Street. The south leg of the intersection would operate as a right-in/right-out intersection, with stop control only on York Street (**Figure 4-17**).

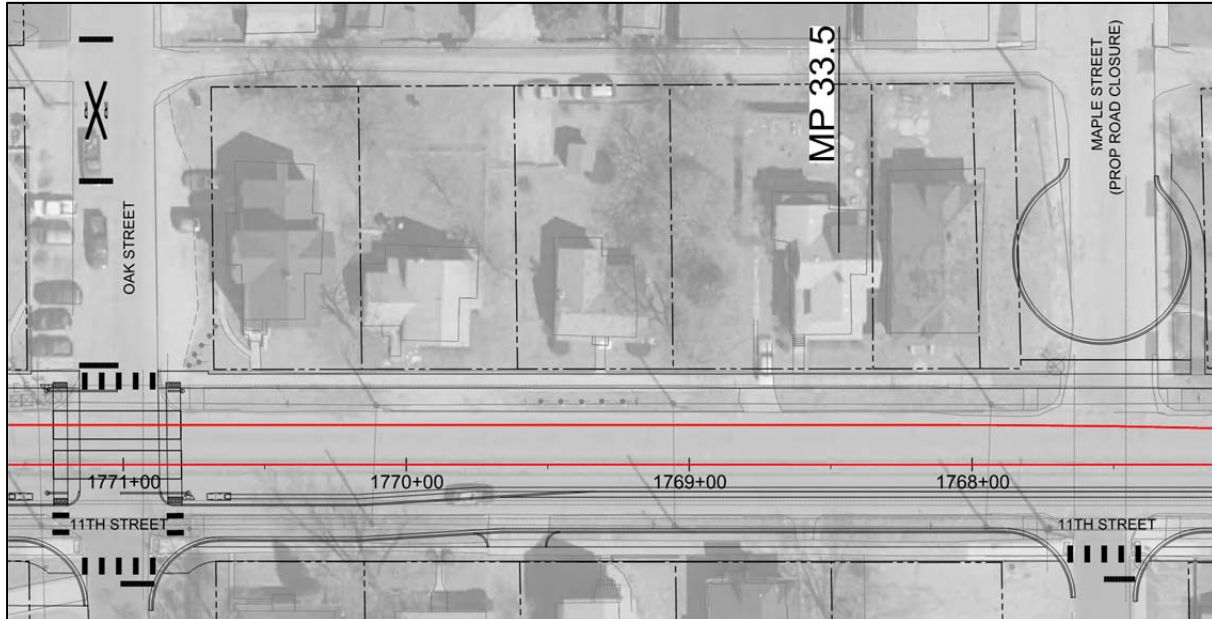
Figure 4-17. Proposed Improvements at the Intersection of 11th and York Streets



4.3.15 11TH STREET AND OAK STREET; 11TH STREET AND MAPLE STREET

The intersection of 11th and Oak Streets would remain a cross intersection with 11th Street restricted to one-way eastbound travel. Oak Street would remain open across the tracks and continue to operate under two-way stop control, and would consist of two 12-foot-wide travel lanes, one in each direction. Pedestrian accommodations would be installed at this location. Crossbucks, flashing warning lights, and gates would be located in the northwest, southwest, and southeast quadrants, facing Oak Street (**Figure 4-18**).

Figure 4-18. Proposed Improvements at the Intersection of 11th Street with Oak Street and Maple Street

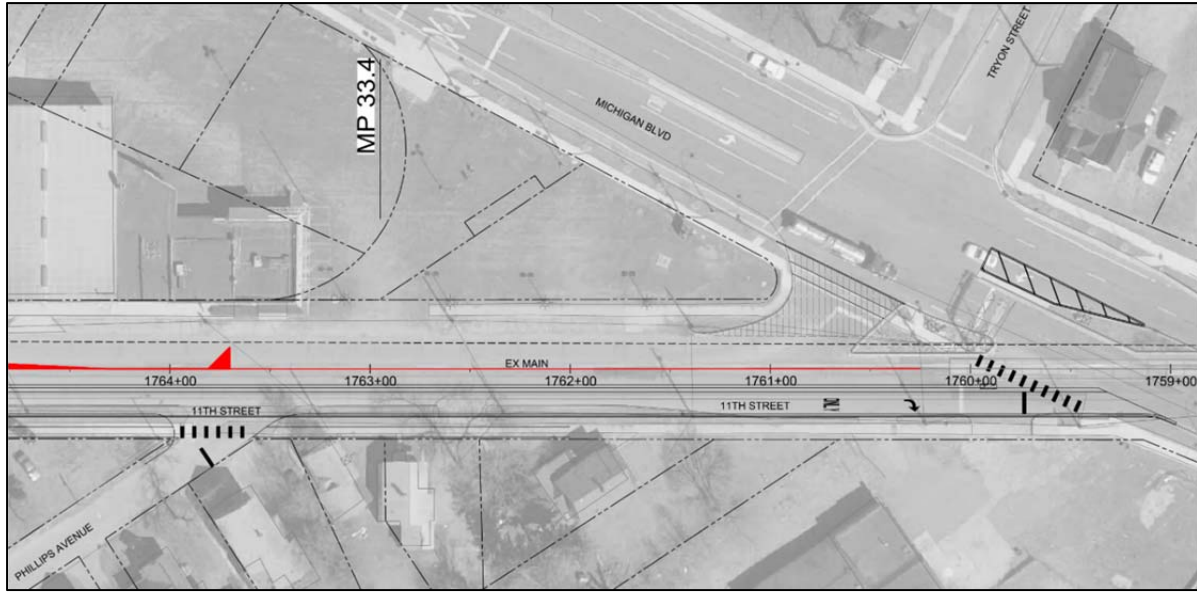


To increase safety, NICTD proposes consolidation of closely spaced crossings, including Maple Street. The intersection of 11th and Maple Streets would be reconfigured to a “T” intersection as the north leg would be closed across the tracks. The south leg of this intersection would operate as a right-in/right-out intersection, with stop control only on Maple Street (**Figure 4-18**).

4.3.16 11TH STREET AND PHILLIPS AVENUE; 11TH STREET AND MICHIGAN BOULEVARD

The intersection of 11th Street and Phillips Avenue would remain a skewed “T” intersection, as Phillips Avenue does not cross the tracks. The south leg of the intersection would operate as a right-in/right-out intersection, with stop control only on Phillips Avenue (**Figure 4-19**).

Figure 4-19. Proposed Improvements at the Intersection of 11th Street with Phillips Avenue and Michigan Boulevard



The intersection of Michigan Boulevard and 11th Street would be modified, eliminating the westbound left- and eastbound right-turn onto 11th Street, and northbound access onto Tyron Street from 11th Street. As a result, 11th Street would be restricted to a right-turn only movement onto southbound Michigan Boulevard (**Figure 4-19**), and 11th Street would remain stop controlled. Pedestrian accommodations would also be installed at this location.

4.3.17 10TH STREET EXTENSION TO U.S. 12

The intersection of 10th Street and Sheridan Avenue would remain a “T” intersection. The extension of 10th Street between Sheridan Avenue and U.S. 12 was identified and included in the *Michigan City/NICTD Rail Realignment Study* (NICTD and Michigan City 2013) to provide direct access from U.S. 12 down 10th Street to the center of Michigan City. Given the low-traffic volumes and existing intersection configuration of Sheridan Avenue at U.S. 12, the proposed extension is not warranted for traffic mitigation (based on NICTD’s proposed alignment improvements). Therefore, this extension was not included in this analysis.

4.4 PROPOSED TRAFFIC

The proposed roadway closures listed in the previous section would cause a corresponding shift in traffic patterns along the project corridor. **Exhibit 2**, located in **Appendix A**, details the proposed assumed rerouting of traffic along the 11th Street corridor. In order to distribute the network’s traffic, the following assumptions were made:

- The directional distribution of the two-way streets being affected by the proposed closures is 50 percent northbound, 50 percent southbound.

- The traveling public would use the roadway network to travel around any proposed closure to get back to the roadway they were originally on.

Given the relatively low volume of traffic throughout the Project Area along 10th and 11th Streets, the redistributed traffic should not cause a significant impact to the local roadway network. The redistributed traffic is shown in **Exhibit 2 (Appendix A)**. The existing average daily traffic, AM design hourly volume (DHV), and PM DHV are shown in blue with the redistributed traffic shown in red.

4.4.1 CAPACITY ANALYSIS

Traffic operations are described by the level of service (LOS). LOS describes the quality of traffic-operating conditions and is rated from A to F, where Level A represents free-flowing traffic and Level F represents complete congestion. Intermediate grades of B, C, D, and E reflect incremental increases in the average delay per stopped vehicle. Urban roadways are generally designed to operate at LOS C or better, and roadways that operate worse than LOS D are generally considered deficient. Control delay and volume-to-capacity ratio are used to characterize LOS for a lane group. Delay quantifies the increase in travel time due to traffic signal control. It is also a surrogate measure of driver discomfort and fuel consumption.

Stop-controlled intersections are evaluated based on the movement or movement groupings that are required to yield to other traffic. Typically, these are the left turns off of the major street and the side-street approaches for two-way stop-controlled intersections. Lower LOS ratings (D, E, and F) do not, in themselves, indicate significant difficulties or the need for additional improvements. Often times, there are convenient alternative paths to avoid the longer delays. Other times, the volumes on the unsignalized approaches are relatively minor when compared to the major street traffic. The LOS thresholds for stop-controlled intersections are listed in **Table 4-3**.

Table 4-3. LOS Thresholds for Stop-Controlled Intersections

Control Delay (s/veh)	LOS by Volume-to-Capacity Ratio	
	≤1.0	>1.0
≤10	A	F
>10-15	B	F
>15-25	C	F
>25-35	D	F
>35-50	E	F
>50	F	F

The intersection of 10th Street and Michigan Boulevard would need to accommodate the westbound traffic that previously utilized the 11th Street and Michigan Boulevard intersection. The additional traffic would have a minimal effect on the operation of the intersection, and it would operate at an acceptable LOS with the additional traffic. The Highway Capacity Software (HCS) results are summarized in **Table 4-4** and the full reports can be found in **Appendix A**.

Table 4-4. HCS Results for the Intersection of 10th Street and Michigan Boulevard

Intersection Approach	Time Period	Existing Conditions			Proposed Conditions		
		LOS	Delay (sec)	Queue (ft)	LOS	Delay (sec)	Queue (ft)
Westbound 10 th Street to Southbound Michigan Boulevard (Left Turn)	AM	A	7.6	2.5	A	7.9	10
	PM	A	8.7	2.5	A	9.2	15
Northbound Michigan Boulevard to Westbound 10 th Street (Left Turn)	AM	A	9.2	2.5	A	9.7	2.5
	PM	B	11.3	5	B	12.8	5

5.0 CONCLUSIONS AND RECOMMENDATIONS

The proposed roadway improvements shown in this report would help facilitate the proposed Project. The necessary side street closures along 10th and 11th Streets are not anticipated to have a significant detrimental impact on local residents or the traveling public. The surrounding roadway network is anticipated to be able to adequately handle the redistributed traffic volumes caused by the proposed Project.

6.0 REFERENCES

- HDR and Patrick Engineering. 2017. *Crash Summary Report*. January 27, 2017.
- NICTD and Michigan City. 2013. *Michigan City/NICTD Rail Realignment Study*.
<http://www.emichigancity.com/cityhall/departments/planning/alternative-analysis/>.

APPENDIX A

Exhibits and HCS 2010 Two-Way Stop-Control Reports



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LEGEND:
 EXIST. ADT
 EXIST. (AM DHV, PM DHV)

NOT FOR CONSTRUCTION SERIES OF SRDPTOTS

NICTD - SOUTH SHORE LINE - MP 33.3 TO 58.4
 DOUBLE TRACK NWI

EXHIBIT 1 - EXISTING CONDITIONS

FILENAME	proposed traffic distribution	SHEET
SCALE	AS NOTED	

DESIGNED:
 DRAWN:
 CHECKED:
 DATE: 12/12/2016

ISSUE	DATE	DESCRIPTION

PLOT DATE: 12/12/2016 2:56:38 PM treesman(Rdwy_Listle)



NOT FOR CONSTRUCTION SERIES OF SRDPTOTS

PLOT DATE: 11/21/2016 6:15:56 PM treesman(Rdwy_Lisle)



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8550 W Bryn Mawr Ave., Suite 900
Chicago, IL 60631
www.hdrinc.com



ISSUE	DATE	DESCRIPTION



NORTHERN INDIANA COMMUTER
TRANSPORTATION DISTRICT
33 East Highway 12
Chesterton, Indiana 46304



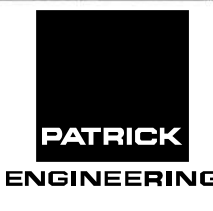
Connectivity for Accelerated Growth
GARY TO MICHIGAN CITY, INDIANA

DESIGNED:	
DRAWN:	
CHECKED:	
DATE:	11/21/2016

NICTD - SOUTH SHORE LINE - MP 33.3 TO 58.4 DOUBLE TRACK NWI		
EXHIBIT 1 - EXISTING CONDITIONS		
FILENAME	traffic schematic for 11th street	SHEET
SCALE	AS NOTED	



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ISSUE	DATE	DESCRIPTION



DESIGNED:	
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DATE:	12/12/2016

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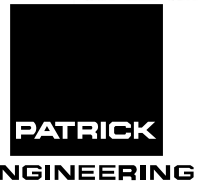
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EXHIBIT 1 - EXISTING CONDITIONS		
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SCALE	AS NOTED	



12/12/2016 12:13:27 PM treeman(Rdw_Lisle)



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 TRANSPORTATION DISTRICT
 33 East Highway 12
 Chesterton, Indiana 46304



GARY TO MICHIGAN CITY, INDIANA

DESIGNED:	
DRAWN:	
CHECKED:	
DATE:	12/12/2016

NICTD - SOUTH SHORE LINE - MP 33.3 TO 58.4 DOUBLE TRACK NWI		
EXHIBIT 1 - EXISTING CONDITIONS		
FILENAME	proposed traffic distribution	SHEET
SCALE	AS NOTED	

SERIES OF SRDPTOTS



LEGEND:
 EXIST. ADT
 EXIST. (AM DHV, PM DHV)
 PROP. ADDITIONAL VEHICLES (AM DHV, PM DHV)

SCALE: 1" = 100'

NOT FOR CONSTRUCTION SERIES OF SRDPTOTS

NICTD - SOUTH SHORE LINE - MP 33.3 TO 58.4
 DOUBLE TRACK NWI

EXHIBIT 2
 PROPOSED TRAFFIC DISTRIBUTION
 SHEET 1

FILENAME	proposed traffic distribution	SHEET
SCALE	AS NOTED	

DESIGNED:
 DRAWN:
 CHECKED:
 DATE: 12/12/2016

ISSUE	DATE	DESCRIPTION

PLOT DATE: 12/12/2016 2:54:28 PM treesman(Rdwy_Lisle)



LEGEND:
 EXIST. ADT
 EXIST. (AM DHV, PM DHV)
 PROP. ADDITIONAL VEHICLES (AM DHV, PM DHV)

SCALE: 1" = 100'

NOT FOR CONSTRUCTION

PLOT DATE: 12/9/2016 2:11:32 AM treeman(Rdw_Lisle)

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 8550 W Bryn Mawr Ave., Suite 900
 Chicago, IL 60631
 www.hdrinc.com

PATRICK
 ENGINEERING

ISSUE	DATE	DESCRIPTION

NICTD
 NORTHERN INDIANA COMMUTER
 TRANSPORTATION DISTRICT
 33 East Highway 12
 Chesterton, Indiana 46304

DOUBLE TRACK N·W·I
 Connectivity for Accelerated Growth
 GARY TO MICHIGAN CITY, INDIANA

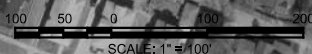
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DATE:	12/9/2016

NICTD - SOUTH SHORE LINE - MP 33.3 TO 58.4
 DOUBLE TRACK NWI
EXHIBIT 2
PROPOSED TRAFFIC DISTRIBUTION
SHEET 2

FILENAME	proposed traffic distribution	SHEET
SCALE	AS NOTED	



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 EXIST. (AM DHV, PM DHV)
 PROP. ADDITIONAL VEHICLES (AM DHV, PM DHV)

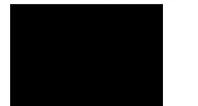


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ISSUE	DATE	DESCRIPTION



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 33 East Highway 12
 Chesterton, Indiana 46304



GARY TO MICHIGAN CITY, INDIANA

DESIGNED:	
DRAWN:	
CHECKED:	
DATE:	12/12/2016

NICTD - SOUTH SHORE LINE - MP 33.3 TO 58.4 DOUBLE TRACK NWI		
EXHIBIT 2		
PROPOSED TRAFFIC DISTRIBUTION		
SHEET 3		
FILENAME	proposed traffic distribution	SHEET
SCALE	AS NOTED	



PLOT DATE: 12/9/2016 2:16:12 AM tresman



HDR Engineering, Inc.
8550 W Bryn Mawr Ave., Suite 900
Chicago, IL 60631
www.hdrinc.com



ISSUE	DATE	DESCRIPTION



NORTHERN INDIANA COMMUTER
TRANSPORTATION DISTRICT
33 East Highway 12
Chesterton, Indiana 46304



DESIGNED:	
DRAWN:	
CHECKED:	
DATE:	12/9/2016

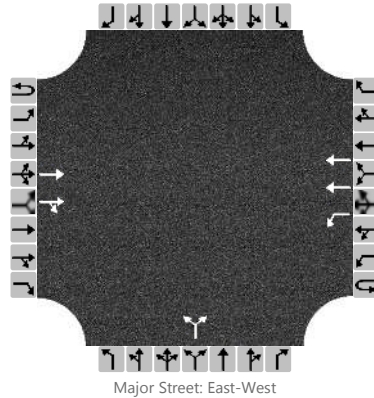
NICTD - SOUTH SHORE LINE - MP 33.3 TO 58.4 DOUBLE TRACK NWI		
EXHIBIT 2		
PROPOSED TRAFFIC DISTRIBUTION		
SHEET 4		
FILENAME	proposed traffic distribution	SHEET
SCALE	AS NOTED	

SERIES OF SRDPTOTS

HCS 2010 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	TWR	Intersection	Michigan Blvd at 10th St
Agency/Co.	Patrick	Jurisdiction	INDOT
Date Performed	12/8/2016	East/West Street	10th St
Analysis Year	2016	North/South Street	Michigan Blvd
Time Analyzed	exist AM Peak	Peak Hour Factor	0.95
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	NICTD DT NWI		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	2	0	0	1	2	0		0	0	0		0	0	0
Configuration			T	TR		L	T				LR					
Volume, V (veh/h)			163	3		22	460			2		16				
Percent Heavy Vehicles (%)						3				3		3				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

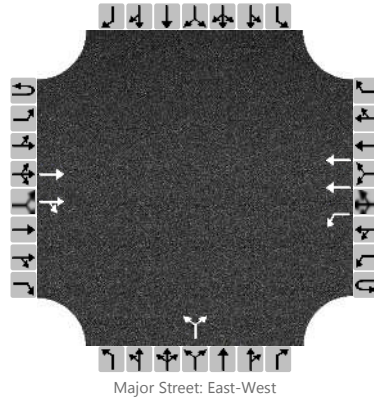
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						23					19					
Capacity, c (veh/h)						1392					873					
v/c Ratio						0.02					0.02					
95% Queue Length, Q ₉₅ (veh)						0.1					0.1					
Control Delay (s/veh)						7.6					9.2					
Level of Service, LOS						A					A					
Approach Delay (s/veh)					0.3				9.2							
Approach LOS									A							

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Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	NICTD DT NWI		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	2	0	0	1	2	0		0	0	0		0	0	0
Configuration			T	TR		L	T				LR					
Volume, V (veh/h)			491	8		46	367			5		26				
Percent Heavy Vehicles (%)						3				3		3				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						48					32					
Capacity, c (veh/h)						1031					599					
v/c Ratio						0.05					0.05					
95% Queue Length, Q ₉₅ (veh)						0.1					0.2					
Control Delay (s/veh)						8.7					11.3					
Level of Service, LOS						A					B					
Approach Delay (s/veh)					1.0				11.3							
Approach LOS									B							

HCS 2010 Two-Way Stop-Control Report

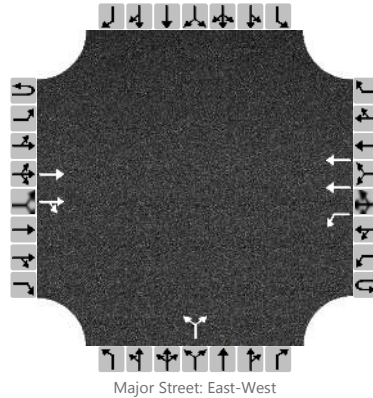
General Information

Analyst	TWR
Agency/Co.	Patrick
Date Performed	12/8/2016
Analysis Year	2016
Time Analyzed	prop AM Peak
Intersection Orientation	East-West
Project Description	NICTD DT NWI

Site Information

Intersection	Michigan Blvd at 10th St
Jurisdiction	INDOT
East/West Street	10th St
North/South Street	Michigan Blvd
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	2	0	0	1	2	0		0	0	0		0	0	0
Configuration			T	TR		L	T				LR					
Volume, V (veh/h)			163	9		142	460			2		16				
Percent Heavy Vehicles (%)						3				3		3				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

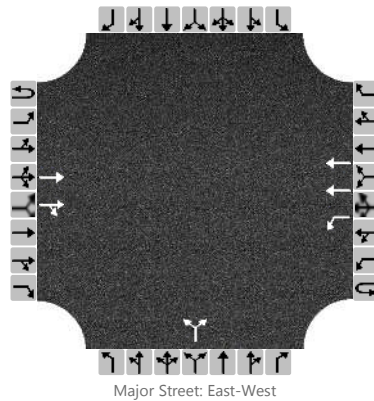
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						149					19					
Capacity, c (veh/h)						1385					787					
v/c Ratio						0.11					0.02					
95% Queue Length, Q ₉₅ (veh)						0.4					0.1					
Control Delay (s/veh)						7.9					9.7					
Level of Service, LOS						A					A					
Approach Delay (s/veh)					1.9				9.7							
Approach LOS									A							

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Time Analyzed	prop PM Peak			Peak Hour Factor	0.95		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
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Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	2	0	0	1	2	0		0	0	0		0	0	0
Configuration			T	TR		L	T				LR					
Volume, V (veh/h)			491	17		165	367			5		26				
Percent Heavy Vehicles (%)						3				3		3				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						174					32					
Capacity, c (veh/h)						1022					491					
v/c Ratio						0.17					0.07					
95% Queue Length, Q ₉₅ (veh)						0.6					0.2					
Control Delay (s/veh)						9.2					12.8					
Level of Service, LOS						A					B					
Approach Delay (s/veh)					2.9				12.8							
Approach LOS									B							