



**North Hamilton Crossing (NHX)
PID 115755
Purpose and Need**

February 9, 2022

Prepared for:

Butler County Transportation
Improvement District (BCTID)

and

City of Hamilton, Ohio

Prepared by:

Stantec Consulting Services Inc.



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1.0 PROJECT BACKGROUND

The North Hamilton Crossing (NHX) project is located in the City of Hamilton, situated approximately 20 miles north of Cincinnati and 30 miles south of Dayton (See **Figure 1**). Over the past two decades, automobile travel from Hamilton's east side to its west side has become slow and congested. This is due in large part to the lack of grade-separated crossings of the CSX & Norfolk Southern Railways, which run north-south across the center of Hamilton; the insufficient number of bridge crossings of the Great Miami River, which also runs north-south through the center of Hamilton; and the increase in traffic. In the center of Hamilton, SR 129 (Main St./High St.), which has an underpass allowing cars to go under the railroad tracks, provides the only continuous east-west through route unimpeded by trains that also provides a bridge crossing over the Great Miami River. As the only continuous east-west through route in Hamilton, SR 129 is often highly congested and experiences a high crash rate, with four intersections listed in the top 60 on ODOT's Highway Safety Improvement Program's 500 priority urban intersections. Traffic on streets without grade-separated crossings can be at a stand-still for several minutes waiting for trains to clear intersections, causing congestion on these streets as well. This congestion significantly impacts east-west travel through Hamilton.

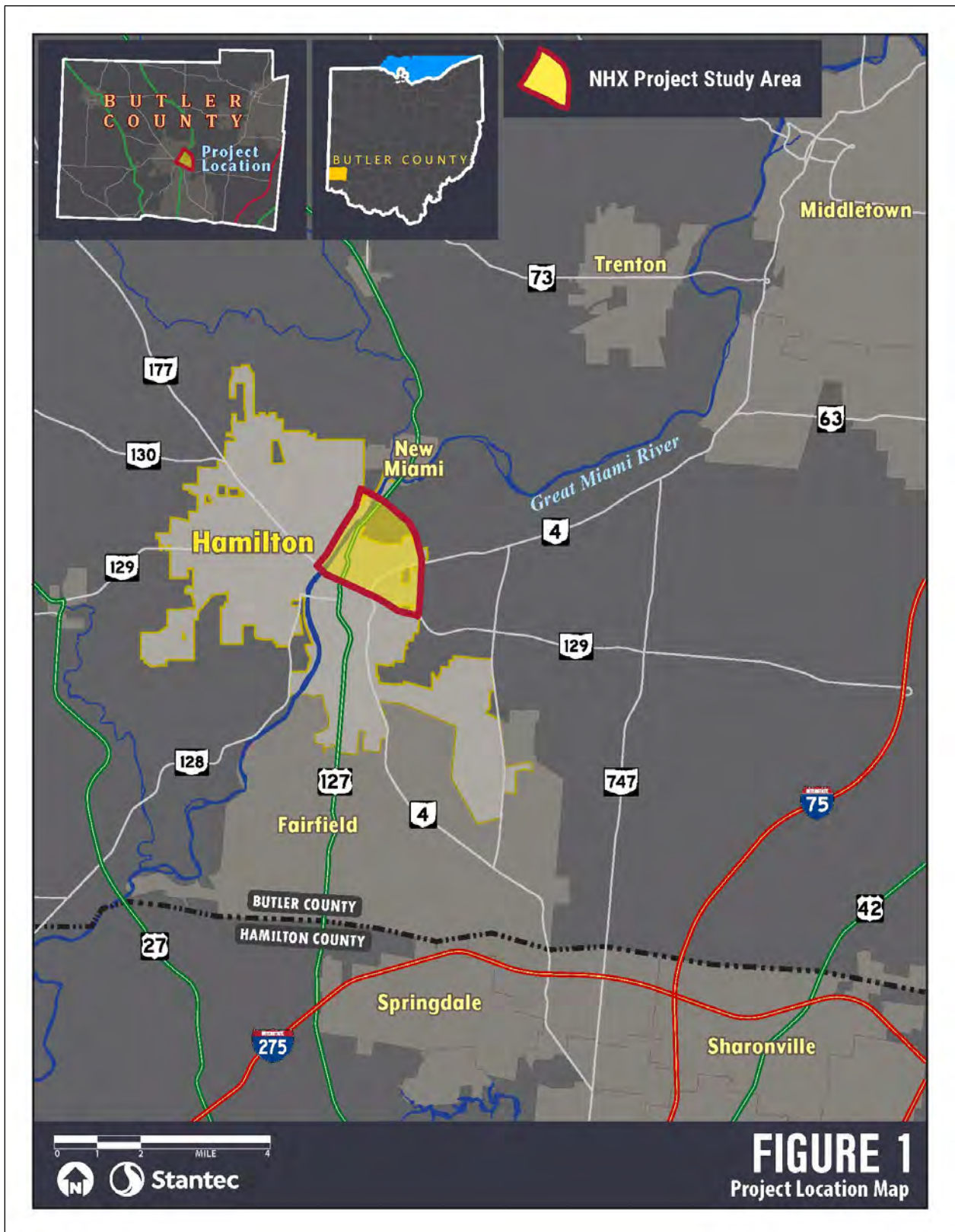
Hamilton has implemented several projects to improve the flow of east-west traffic through Hamilton, including the construction of the South Hamilton Crossing (SHX) overpass. The SHX overpass project, which replaced an at-grade railroad crossing with a bridge and provided a new connection between SR 4 and University Boulevard, provided the second grade-separated rail crossing in the City and improved east-west travel in southern Hamilton. However, in the northern half of Hamilton there is no grade-separated crossing to alleviate train disruptions.

Hamilton has invested millions of dollars over the past two decades to invigorate housing and commercial space in vacant and underutilized spaces. Since 2000, Hamilton's commercial vacancy rate has declined from 90% to 2% (Greater Ohio Policy Center, 2021). In addition, the Spooky Nook Sports Complex (Spooky Nook Sports) has recently begun development in the former Champion Mill, located on the west bank of the Great Miami River in the heart of downtown Hamilton. Spooky Nook Sports is investing \$144 million to create a sports and event center shown on **Figure 2**. This multi-use center is estimated to draw an anticipated 1.1 million visitors annually (City of Hamilton, 2020). Without an additional east-west through route through northern Hamilton, which could serve as an alternative to SR 129, traffic congestion will continue to get worse as traffic generated by ongoing development increases.

1.1 HISTORY OF THE NORTH HAMILTON CROSSING (NHX) PROJECT

The North Hamilton Crossing (NHX) project was conceptualized over twenty years ago as a way to improve east-west connectivity through the northern part of Hamilton where existing at-grade railroad crossings and limited river crossing options created significant traffic congestion. Over the past twenty years, the NHX project has been identified as a priority project in local and regional transportation plans. The NHX project was first identified in the 2002 study, "Preliminary Evaluation of Transportation Improvements in the Hamilton North/New Miami Area." Since that time, elements of the project have been included in Butler County's Throughfare Plan (2007, updated in 2017), as well as the OKI's (Ohio-Kentucky-Indiana) Regional Council of Government's 2040 and 2050 Metropolitan Transportation Plans and the City of Hamilton's recently updated comprehensive plan, *Plan Hamilton*, 2019. The project also aligns with the goals and







recommendations of other recent planning initiatives including: the City of Hamilton Bikeway Master Plan (2019), which identifies the City’s goal to encourage alternate forms of transportation throughout the community and build connections to current and future trail projects; and the City of Hamilton’s Riverfront Master Plan (2018), which provides a guide to increasing investment in the river corridor, including promoting ease of travel along the riverfront. The City of Hamilton also prepared an Active Transportation Plan in 2020, which included recommendations for increasing pedestrian and trail projects in the City of Hamilton – including shared-use paths across the river to provide connectivity between the developing Spooky Nook complex on the west side of the river and Downtown Hamilton on the east.

1.2 NHX PROJECT ACTIVITIES TO DATE

In 2020, the City of Hamilton and the Butler County Transportation Improvement District (BCTID) committed funds to move the NHX project forward. The City committed \$750,000 and the BCTID committed \$250,000, for a total of \$1 million, to fund the planning and preliminary engineering phases of the NHX project. In November of 2020, the City of Hamilton began to develop the Purpose and Need for the NHX project. This effort included the following activities to support the development of the Purpose and Need:

Visioning Exercise: A visioning exercise was held on February 23, 2021 with sixteen government stakeholders from the City of Hamilton and Butler County. This exercise included a poll to determine the stakeholders’ opinions on why they believed the NHX project is needed and what outcomes they hoped would be achieved by the project. The results of these polls are shown in **Tables 1** and **2**.

Table 1. Feb. 2021 Visioning Exercise: Reasons for NHX Project

Number (Percentage) of Stakeholders Responding	Reasons for NHX Project
7 (44%)	To replace Black Street Bridge
7 (44%)	To improve connectivity
6 (38%)	To improve travel time within the region
5 (31%)	To support economic growth
5 (31%)	To provide congestion relief



Table 2. Feb. 2021 Visioning Exercise: Desired Outcomes for NHX Project

Number (Percentage) of Stakeholders Responding	Desired Outcomes For NHX Project (Each stakeholder could pick 2 outcomes)
8 (50%)	Mobility/Thru Traffic/Commuting
7 (44%)	New railroad crossing (separated)
5 (31%)	Connectivity
5 (31%)	Providing for ALL modes
4 (25%)	Functionality (serves our needs)
1 (6%)	Aesthetics/Beauty/Streetscaping
1 (6%)	Safety
1 (6%)	Economic Development

NHX Public Needs Survey: A Public Needs Survey was held between August 30, 2021 and September 30, 2021. This survey had approximately 1,600 participants and received 4,188 comments. The survey provided feedback on the primary and secondary needs for the project. Based on the survey results, the transportation concerns of the respondents are identified in **Table 3**.

Development of a HEAT Map: Geographical Information Systems (GIS) mapping was developed to identify sensitive environmental features, as well as cultural resources, community features, and potential hazardous materials concerns within the NHX study area to identify constraints within the project area and help further define the project's Purpose and Need.

Table 3. NHX Public Needs Survey Transportation Concerns

Number (Percentage) of Survey Respondents Who Identified Concern	Transportation Issues of Greatest Concern
633 (76%)	Limited direct routes when traveling between east and west sides of Hamilton
645 (77%)	Congestion on streets



576 (69%)	Congestion on bridges across the river
576 (69%)	Delays caused by trains crossing the streets
564 (67%)	Condition of streets
412 (49%)	Vehicle crash rates
413 (49%)	Safety concerns for pedestrians
358 (43%)	Safety concerns for bicyclists
368 (44%)	Limited access to public transportation
352 (42%)	Lack of dedicated bike routes

Traffic Studies: Traffic studies were conducted to determine the Level of Service (LOS) of intersections and roadway segments within the study area for 2020 (existing year), 2030 (opening year) and 2050 (design year) for No-Build traffic volumes. A safety/crash analysis of 22 intersections within the study area was also conducted. In addition, an Origin-Destination (O-D) Study was conducted to understand the travel patterns of motorists traveling through the City of Hamilton. These studies were used to develop quantified data to support the determination of transportation needs within the City.

Public Engagement Plan (PEP): A PEP was developed which provided an overview of the public involvement opportunities that would occur throughout the NHX project to ensure that the public and project stakeholders are provided opportunities throughout project planning and development to provide input in accordance with existing laws and regulations.

Stakeholder Meeting: A stakeholder meeting was held on November 9, 2021 with 32 representatives of community and neighborhood organizations, special interest groups, local government officials, property and business owners, and other stakeholders in the NHX project area. The stakeholders were provided with an overview of the NHX project, results of the Public Needs Survey, and an overview of conceptual alignments.

Funding Status: The City of Hamilton and BCTID have submitted several grant applications for Federal funds. On September 29, 2021, Ohio Department of Transportation (ODOT) TRAC funding was awarded to the NHX project. TRAC Funding was \$2M with a \$2M local match. The project has also been recommended for \$1M of Congressional Discretionary Funding through Senator Sherrod Brown’s Office; this funding is tied to the federal infrastructure bill and has not been formally announced at this writing. **Table 4** provides a timeline of the NHX project since its conceptualization in 2002.



Table 4. NHX Project Timeline

Date	Event
2002	NHX project identified in “Preliminary Evaluation of Transportation Improvements in the Hamilton North/New Miami Area
2007, updated April 2017	NHX project (called the Washington Boulevard Extension) identified in the <i>Butler County Thoroughfare Plan</i> as a high priority project
2016	Replacement of the Black Street Bridge identified as a recommended project on the 2040 OKI (Ohio Kentucky Indiana) 2040 Plan
2019	NHX project included in City of Hamilton’s Master Plan, <i>Plan Hamilton</i>
2020	NHX project identified as a priority in the 2050 OKI (Ohio Kentucky Indiana) 2050 Plan
November 2020	Planning and preliminary engineering phases of the NHX project begun
8/29/2021 – 9/30/2022	Public Input Opportunity – Needs Survey
9/29/2021	ODOT TRAC Funding Awarded - \$2M with \$2M local match
11/09/2021	NHX Stakeholder Meeting

2.0 PURPOSE STATEMENT

The purpose of the proposed project is to improve east-west connectivity north of SR 129 in the City of Hamilton in order to reduce congestion and improve mobility in support of current and planned economic growth in the City of Hamilton and western Butler County, as identified in *Plan Hamilton*.

Need Elements

The need elements of the NHX project include existing or future conditions that are causing the transportation problems (primary needs), as well as needs that may not be up to a desired standard but are not causing undue issues (secondary needs). Primary needs **must** be addressed to the extent feasible in order to satisfy the purpose and need; whereas secondary needs are considered discretionary and are not the deciding factor in alternative development.



3.0 PRIMARY NEEDS

Based on input received from the Visioning Exercise and Public Needs Survey, as well as data developed through the traffic studies, the project's primary needs were determined to be: improved east-west connectivity; insufficient crossings of the Great Miami River; lack of grade-separated railroad crossings; mobility/congestion; and safety. These needs are described as follows:

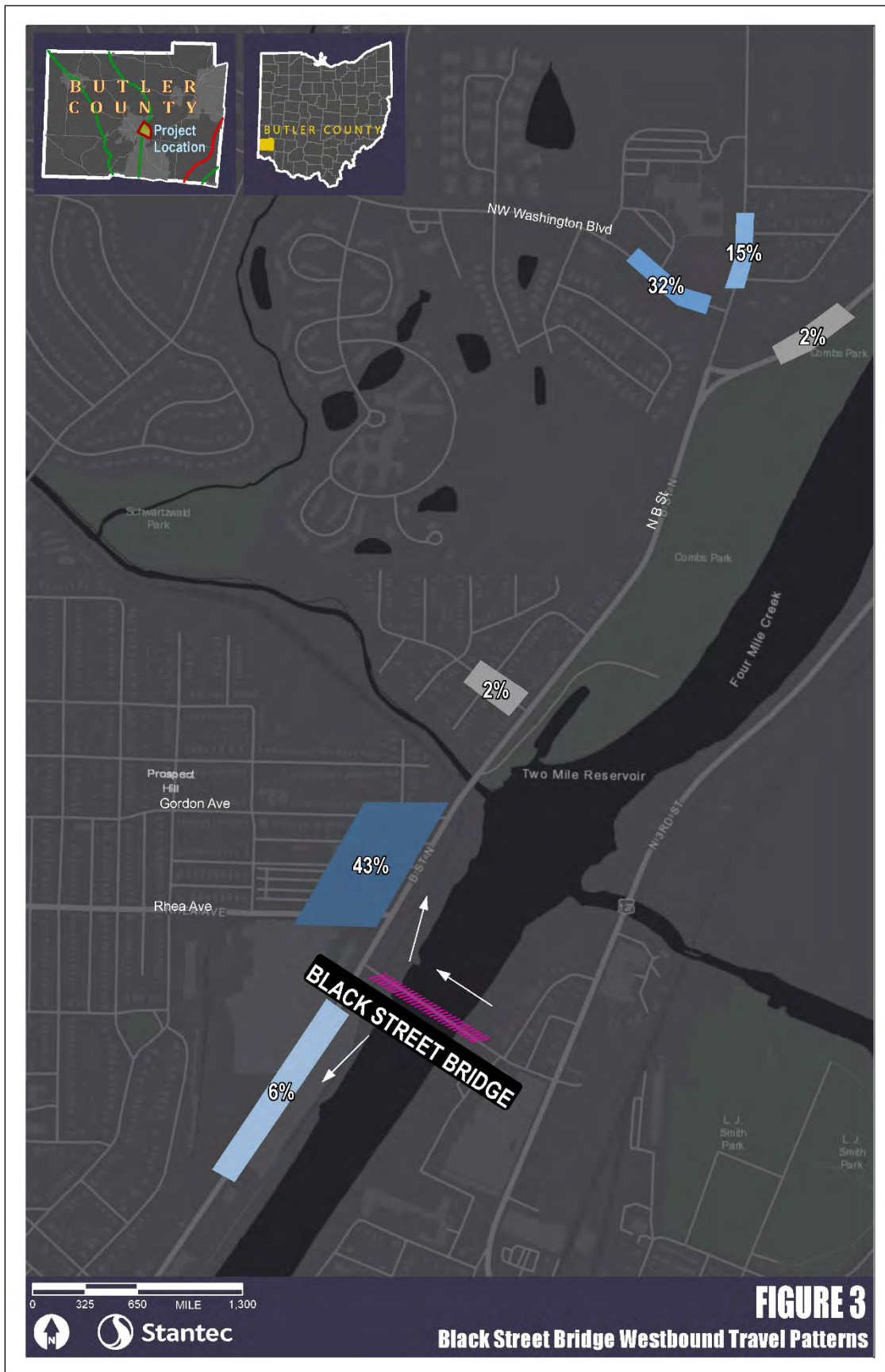
3.1 IMPROVE EAST-WEST CONNECTIVITY

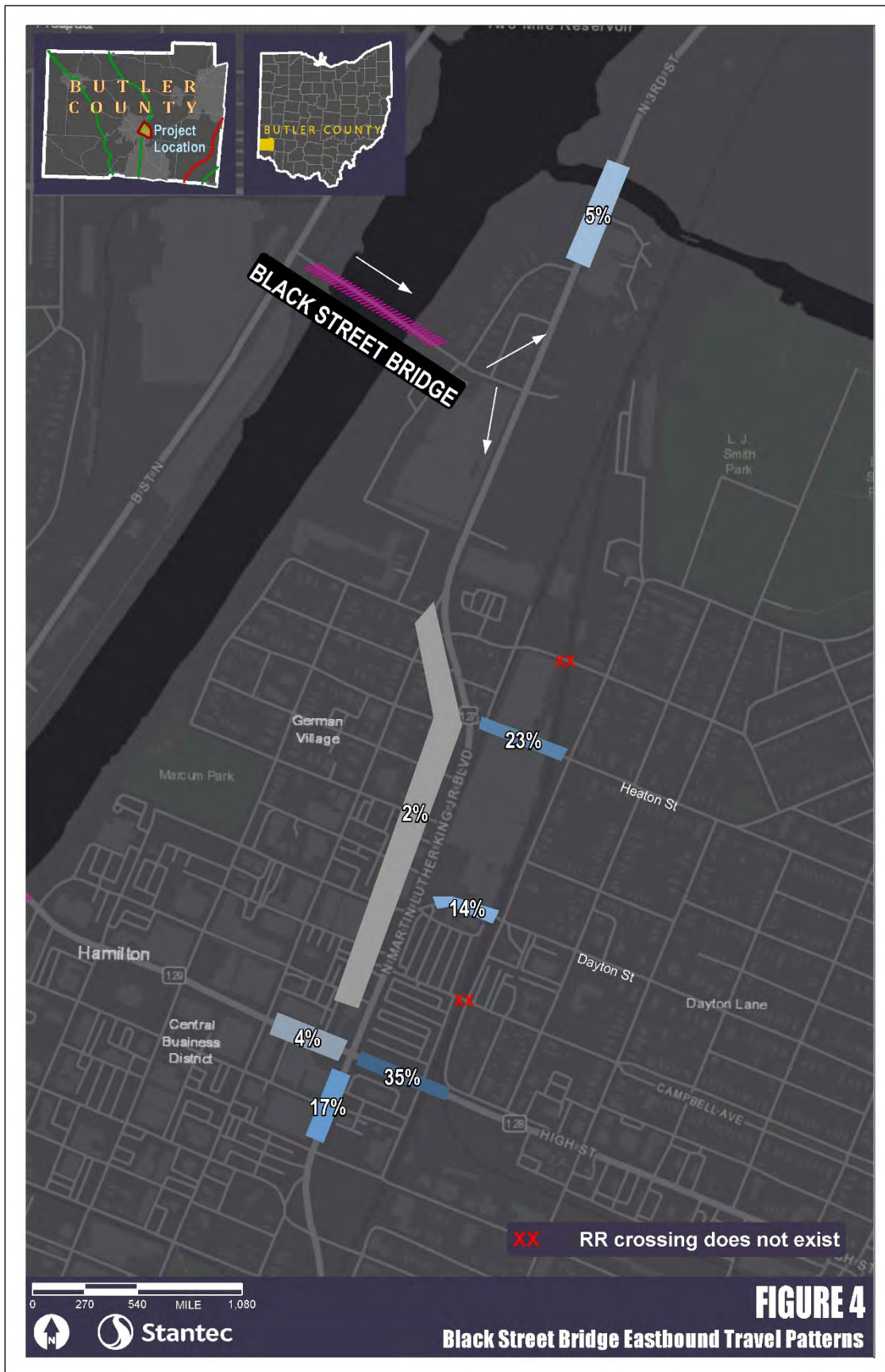
Improved connectivity between the east and west sides of Hamilton is a primary need of this project. Currently, the primary east-west arterial for traffic flow through the City of Hamilton is SR 129. SR 129 runs through downtown Hamilton and includes the Jack Kirsch Underpass (one of only two grade-separated rail crossings in Hamilton), and the SR 129 (High-Main) Bridge (one of four bridge crossings over the Great Miami River) and is the only continuous east-west route in the City. In addition to providing east-west access within the City, SR 129 is also critical to regional transportation beyond the City. For example, motorists traveling from Hamilton to Oxford, a major employment center and home of Miami University of Ohio, utilize SR 129 to access US 27 which connects to Oxford. Based on 2019 StreetLight Origin-Destination (O-D) data, the High Main Bridge carries approximately 40% of North Hamilton traffic across the Great Miami River (this is discussed further in Section 3.2). Because SR 129 provides the only continuous east-west through route in the city, it has become very congested. Five segments of SR 129 between 3rd Street and Hampshire Drive are currently operating at Level of Service (LOS) E or F during PM peak hour, defined as having near capacity levels with stop-and-go traffic and poor travel times (this is discussed further in Section 3.4).

When traffic is congested on SR 129 and the High-Main Bridge, motorists traveling from east of the river to Hamilton's west side utilize other east-west streets, including Heaton and Dayton Streets, to access the Black Street Bridge. Based on O-D data, the Black Street Bridge currently carries approximately 30% of the traffic across the Great Miami River. (This is discussed further in Section 3.2). O-D data was also used to identify the travel patterns of vehicles using the Black Street Bridge and the roadways that are utilized on each side of the bridge. **Figure 3** illustrates the travel patterns of vehicles using the Black Street Bridge and the roadways that traffic uses west of the Great Miami River. As shown in **Figure 3**, 6% of west-bound vehicles on the Black Street bridge turn south towards SR 129, 43% vehicles go west into Hamilton using Rhea and Gordon Avenues, and 49% of traffic travels north on North B Street to reach NW Washington Boulevard or to continue north out of the City. With the imminent development of Spooky Nook on the west side of the river, traffic on North B Street south of the bridge is anticipated to increase. With improved east-west connectivity to North B Street, distribution of existing travel patterns will be better supported and allow for anticipated increases.

The travel patterns of vehicles using the Black Street Bridge and the roadways that traffic uses east of the Great Miami River are shown on **Figure 4**. Approximately 35% of vehicles use US 127 to get to SR 129 and 23% use US 127 to get to Heaton Street. An alternative route to SR 129 and Heaton Street that spans the Great Miami River is needed to relieve congestion on SR 129 and Heaton Street. Without an alternative route, the majority of Black Street Bridge traffic is forced to use SR 129, which is a congested corridor, or either Heaton Street or Dayton Street, neither of which have a grade-separated crossing of the heavily trafficked railroad.







Improved east-west connectivity through Hamilton north of SR 129 is needed to reduce travel times through the City and improve access to regional and national highways including SR 4 (Erie Blvd.), SR 129, US 127 (MLK Jr. Blvd.), and I-75. This need has been identified by Hamilton residents during several public engagement opportunities as well. During the Plan Hamilton community outreach efforts, poor east-west connectivity was identified as a major impediment to economic and residential growth for the west side of Hamilton, as well as a primary reason for individuals choosing not to live or locate businesses in Hamilton. In addition, based on input received from the Visioning Exercise described in Section 1.2, 31% of the stakeholders indicated that east-west connectivity was a need for the NHX project and 633 (76%) of the Public Needs Survey respondents indicated that the lack of a direct route, when traveling between the east and west sides of Hamilton, was a transportation need.

3.2 INSUFFICIENT CROSSINGS OF THE GREAT MIAMI RIVER

A major contributor to the traffic congestion within the study area is the lack of crossings of the Great Miami River. Currently, there are four bridge crossings within and adjacent to the project area. They are (from south to north): the Pershing Avenue Bridge (also known as the Columbia Bridge), the SR 129 (High-Main) Bridge, the Black Street Bridge and the US 127 Bridge. Currently, there is insufficient capacity on these bridges to accommodate existing traffic demand, resulting in traffic congestion at both the Black Street Bridge and High-Main Bridge. Of these bridges, the Black Street Bridge, which connects North B Street on the west side of the Great Miami River, is nearing the end of its serviceable life. The bridge was constructed in 1922 and its service life is anticipated to expire in 25 years. Increased maintenance will be required to keep the bridge operational. In addition, due to structural constraints, the bridge cannot be widened to add additional lanes and will, therefore, be unable to accommodate future traffic demand. The Black Street Bridge currently has an average daily traffic (ADT) of approximately 13,000 and is expected to exceed its two-lane PM peak hour capacity by 2030 (Stantec, 2021).

Travel patterns within the study area were identified using 2019 StreetLight Origin-Destination (O-D) data for O-D pairs shown on **Figure 5** and identified on **Table 5** to determine the percent of traffic utilizing the four river crossings (Streetlight Data, 2019). Each pair represents trips originating at seven locations east of the Great Miami River and traveling to areas in north Hamilton (shown in blue on **Figure 5**), and the reverse trips originating in north Hamilton and traveling to the points east of the river. As shown on **Table 5**, the Black Street Bridge is currently used by approximately 30% of North Hamilton traffic on US 127, Dixie Highway, SR 4, Hancock Avenue, and Princeton Road, making it the second most utilized bridge after the SR 129 Bridge.

Currently, the river crossings of the Great Miami River are a major point of traffic congestion due to their lack of capacity. Due to the existing traffic congestion occurring at the bridges, combined with the obsolescence of the Black Street Bridge, which currently carries approximately 30% of the traffic across the Great Miami River, the addition of a new river crossing is a primary transportation need. As indicated in **Tables 1** and **2**, this need is supported by the results of the Visioning Exercise and the Public Needs Survey. Forty-four percent (44%) of the City/County stakeholders indicated that the replacement of the Black Street Bridge is a major need of the project and 576 (69%) of the respondents of the Public Needs Survey indicated that congestion at the bridge crossings is a significant transportation concern.



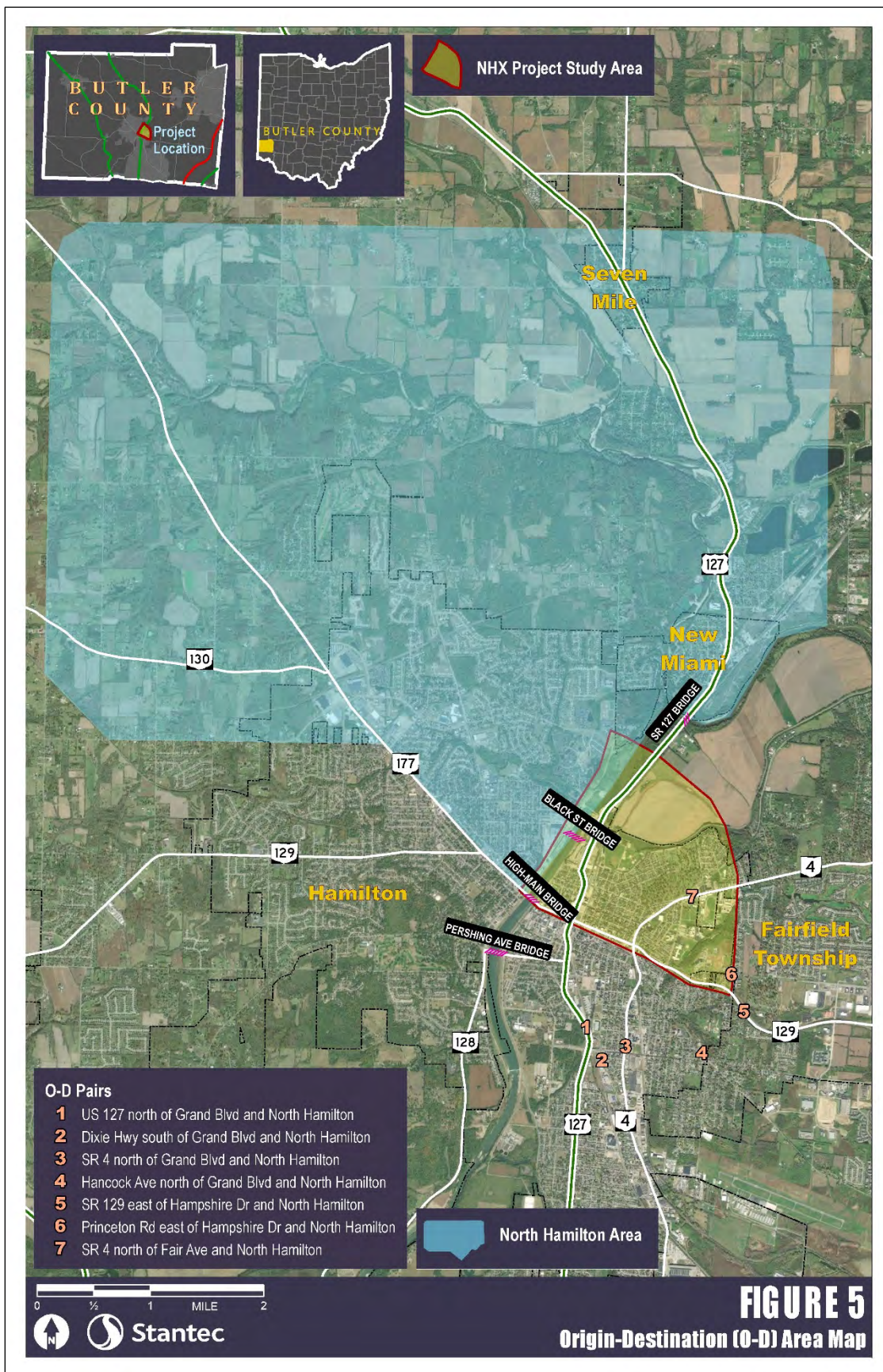


Table 5. NHX Origin-Destination (O-D) Pairs

O-D Pair	Pershing Ave Bridge	SR 129 Bridge	Black St Bridge	US 127 Bridge
US 127 north of Grand Bld and North Hamilton	15%	40%	30%	15%
Dixie Hwy south of Grand Bld and North Hamilton	15%	40%	30%	15%
SR 4 north of Grand Bld and North Hamilton	5%	55%	30%	10%
Hancock Ave north of Grand Bld and North Hamilton	0%	50%	35%	15%
SR 129 east of Hampshire Dr and North Hamilton	0%	60%	30%	10%
Princeton Rd east of Hampshire Dr and North Hamilton	0%	60%	30%	10%
SR 4 north of Fair Ave and North Hamilton	0%	45%	45%	10%

Source: Stantec, 2021.

3.3 LACK OF GRADE-SEPARATED RAILROAD CROSSINGS

Another major contributor to the traffic congestion within the study area is the presence of the CSX & Norfolk Southern Railways, which traverse the center of Hamilton. There are only two grade-separated railroad crossings within the city limits: the SR 129 underpass and the recently opened South Hamilton Crossing overpass on Grand Boulevard. However, there are 26 at-grade crossings in Hamilton. To quantify the impacts of rail traffic on the roadway network, the Stantec team observed the three at-grade railroad crossings adjacent to and north of SR 129 for a 24-hour period on December 1, 2020. These crossings occur at Heaton Street and Dayton Street north of SR 129, and at Maple Avenue south of SR 129. During the observations, a total of 38 trains traveled through Hamilton. These trains must travel slowly due to 90-degree turns that are located downtown. During the 24-hour period, the Heaton Street and Dayton Street crossings were blocked for approximately 15% of the day while Maple Avenue was blocked for about 10% of the day. During the 24-hour period, trains blocked one of these intersections for a total of 5 hours (22% of the day). Crossing gates were down on average for six minutes at Heaton Street and Dayton Street and five minutes at Maple Avenue. When the gates were down, 10-15% of traffic that would otherwise use Heaton Street, Dayton Street, and Maple Avenue shifted onto SR 129 to utilize the grade-separated railroad crossing, further contributing to congestion at side street approaches to SR 129 where traffic waited to access SR 129. The need for a grade-separated railroad crossing was also supported by input received from the Visioning Exercise and the Public Needs Survey discussed in Section 1.2. As shown on **Table 2**, 44% of the stakeholders indicated that a new grade-separated railroad crossing was a desired outcome of the NHX project. **Table 3** indicates that 576 survey respondents (69%) indicated that delays caused by trains was a major transportation concern.

3.4 MOBILITY/CONGESTION ON LOCAL ROAD NETWORK

Related to the transportation needs of east-west connectivity, insufficient crossings of the Great Miami River, and lack of grade-separated railroad crossings, is the overall need of enhanced mobility and reduced congestion on the local road network. This section provides a description of the overall congestion within north Hamilton under existing and future conditions. The root causes of much of this congestion are bottlenecks which occur at the bridge crossings, as well as the delays at rail crossings. Based on input received from the Visioning Exercise described in Section 1.2, 31% of the stakeholders indicated that traffic congestion was a need for the NHX project and, related to this, 50% of the stakeholders indicated that



improved mobility/thru traffic and commuting were important outcomes of the NHX project. Similarly, 645 (77%) of the Public Needs Survey respondents indicated that congestion on streets within the NHX study area is a transportation concern.

To analyze the existing congestion on study area roadways, the Stantec team performed an operational analysis of 22 intersections along SR 129 (Main St./High St.), West Elkton Drive, North B Street, US 127 (Martin Luther King Jr. (MLK) Blvd.), and SR 4 (Erie Blvd.). Traffic data was collected at 22 intersections within the study area in April 2019, November 2020, and December 2020. Since traffic volumes were collected in 2020, the impacts of the COVID pandemic were reviewed to see if any adjustments to traffic volumes were needed. The 2020 volumes were compared to historic ODOT traffic volumes. In most cases, the traffic volumes collected represented an increase in traffic compared to the most recent pre-COVID data collected by ODOT. Therefore, no COVID-19 adjustment factors were used to adjust traffic volumes. The operational analysis identifies the Level of Service (LOS) of intersections in the study area. The Highway Capacity Manual 6th Edition (2016) defines LOS as a qualitative measure that describes operational conditions within a traffic stream, generally in terms of measures like speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. LOS ranges from LOS A, which indicates free-flow operations, and LOS F, which indicates severe congestion with the road in a state of constant traffic jam (Transportation Research Board, 2016). The results of this analysis, shown on **Table 6**, indicate that three intersections have an overall intersection level of service (LOS) of E or F. These intersections are SR 129 & B Street, SR 129 & US 127 (MLK, Jr. Blvd.), and SR 129 & SR 4 (Erie Blvd.). Average delay times at these intersections range from 55.9 seconds to 98.3 seconds per vehicle. In addition, an additional 11 of the 22 intersections have two legs with LOS E or F, and four additional intersections have one leg with LOS E.

An operational analysis was also conducted for study area roadway segments to show where congestion exists. The results of this analysis are shown on **Table 9**, as well as **Figure 6**. Five segments of SR 129 are currently operating at LOS E or F during PM peak hour and one segment of North B Street is operating at LOS F during PM peak hour.

Future Conditions: Traffic congestion in the study area is expected to get worse in the future as traffic demand increases due to ongoing residential development, redevelopment of the Main Street corridor, and the Spooky Nook development. The Spooky Nook development, which is planned to open in 2022, will generate 1,250 new PM peak hour trips. Future traffic volumes were developed for an Opening Year of 2030 and a Design Year of 2050. Future traffic volumes within the study area were estimated using a 2% linear annual growth rate from 2020 to the Opening Year of 2030 and a 1% linear annual growth rate from the Opening Year of 2030 to the Design Year of 2050. The future year no-build traffic forecasts were approved by ODOT's Office of Modeling & Forecasting.

The results of the 2030 Opening Year intersection analysis, shown on **Table 7**, indicate that seven intersections have an overall intersection LOS of E or F. Average delay times at these intersections range from 59.3 seconds to 227.7 seconds per vehicle. The results of the 2050 Design Year intersection analysis, shown on **Table 8**, indicate that 10 intersections have an overall intersection LOS of E or F. Average delay times at these intersections range from 57.9 seconds to 362.8 seconds per vehicle.

Five segments of SR 129 are currently operating at LOS E or F during PM peak hour and one segment of North B Street is operating at LOS F during PM peak hour. With the additional growth in traffic volumes, the existing congestion along SR 129 will continue to get worse. The entire length of SR 129 is expected



Table 6. Existing (Fall 2020) Intersection Operations

Intersection	Intersection Control	Time Period	Overall Intersection		Max v/c Ratio	Approach LOS			
			Delay (sec/veh)	LOS		EB	WB	NB	SB
SR 129 (Main St) & B St	Signal	AM	98.3	F	1.23	F	A	E	F
		PM	23.8	C	0.67	B	B	D	D
SR 129 (Main St/High St) & Monument St	Signal	AM	2.1	A	0.63	A	A		D
		PM	2.7	A	0.70	A	A		C
SR 129 (High St) & Front St	Signal	AM	13.2	B	0.63	A	A	E	E
		PM	19.2	B	0.64	B	B	E	E
SR 129 (High St) & 2nd St	Signal	AM	9.0	A	0.53	A	A	E	E
		PM	16.5	B	0.48	B	B	E	E
SR 129 (High St) & 3rd St	Signal	AM	9.3	A	0.66	A	A	E	F
		PM	14.1	B	0.74	A	A	E	E
SR 129 (High St) & US 127 (MLK Jr Blvd)	Signal	AM	53.5	D	0.97	D	C	F	E
		PM	55.9	E	1.18	D	D	F	E
SR 129 (High St) & 7th St	Signal	AM	7.0	A	0.63	A	A	E	E
		PM	12.7	B	0.62	A	A	E	E
SR 129 (High St) & East Ave	Signal	AM	9.6	A	0.69	B	A	E	
		PM	12.3	B	0.65	A	B	E	
SR 129 (High St) & SR 4 (Erie Blvd)	Signal	AM	40.2	D	0.80	C	D	E	E
		PM	62.5	E	1.08	C	F	F	D
SR 129 (High St) & Fair Ave	Signal	AM	23.0	C	0.82	B	B	E	D
		PM	26.4	C	1.00	B	B	E	F
SR 129 (High St) & Hampshire Dr	Signal	AM	12.6	B	0.56	A	A	D	D
		PM	33.5	C	0.93	C	C	D	D
Elkton Rd & NW Washington Blvd	Stop	AM	n/a	n/a	0.69	C		A ¹	
		PM	n/a	n/a	0.52	C		A ¹	
Elkton Rd & N B St	Stop	AM	n/a	n/a	0.61		D		A ¹
		PM	n/a	n/a	0.60		D		A ¹
N B St & Rhea Ave	Signal	AM	23.4	C	0.90	E		A	B
		PM	20.1	C	0.89	D		B	C
N B St & Black St	Signal	AM	18.2	B	0.90		C	C	B
		PM	27.9	C	0.80		C	D	B
N B St & Park Ave	Signal	AM	28.3	C	0.88		C	C	D
		PM	31.2	C	0.88		C	C	D
US 127 (N 3rd St) & Black St	Signal	AM	23.9	C	0.76	C	C	B	C
		PM	20.2	C	0.92	C	D	B	B
US 127 (MLK Jr Blvd) & Heaton St	Signal	AM	9.6	A	0.79	E	E	A	A
		PM	18.1	B	0.88	D	E	B	A
US 127 (MLK Jr Blvd) & Dayton St	Signal	AM	23.3	C	0.81	B	B	B	C
		PM	15.2	B	0.78	C	D	A	B
US 127 (MLK Jr Blvd) & Maple Ave	Signal	AM	12.0	B	0.44	C	C	B	B
		PM	10.0	B	0.51	C	C	A	A
SR 4 (Erie Blvd) & Fair Ave	Signal	AM	16.8	B	0.48	A	A	D	D
		PM	20.2	C	0.70	B	B	D	E
SR 4 (Erie Blvd) & Dayton St	Signal	AM	18.4	B	0.80	E	E	A	A
		PM	18.8	B	0.81	E	E	A	A

1.

Delay reported for left turn movement

Source: Stantec, 2021



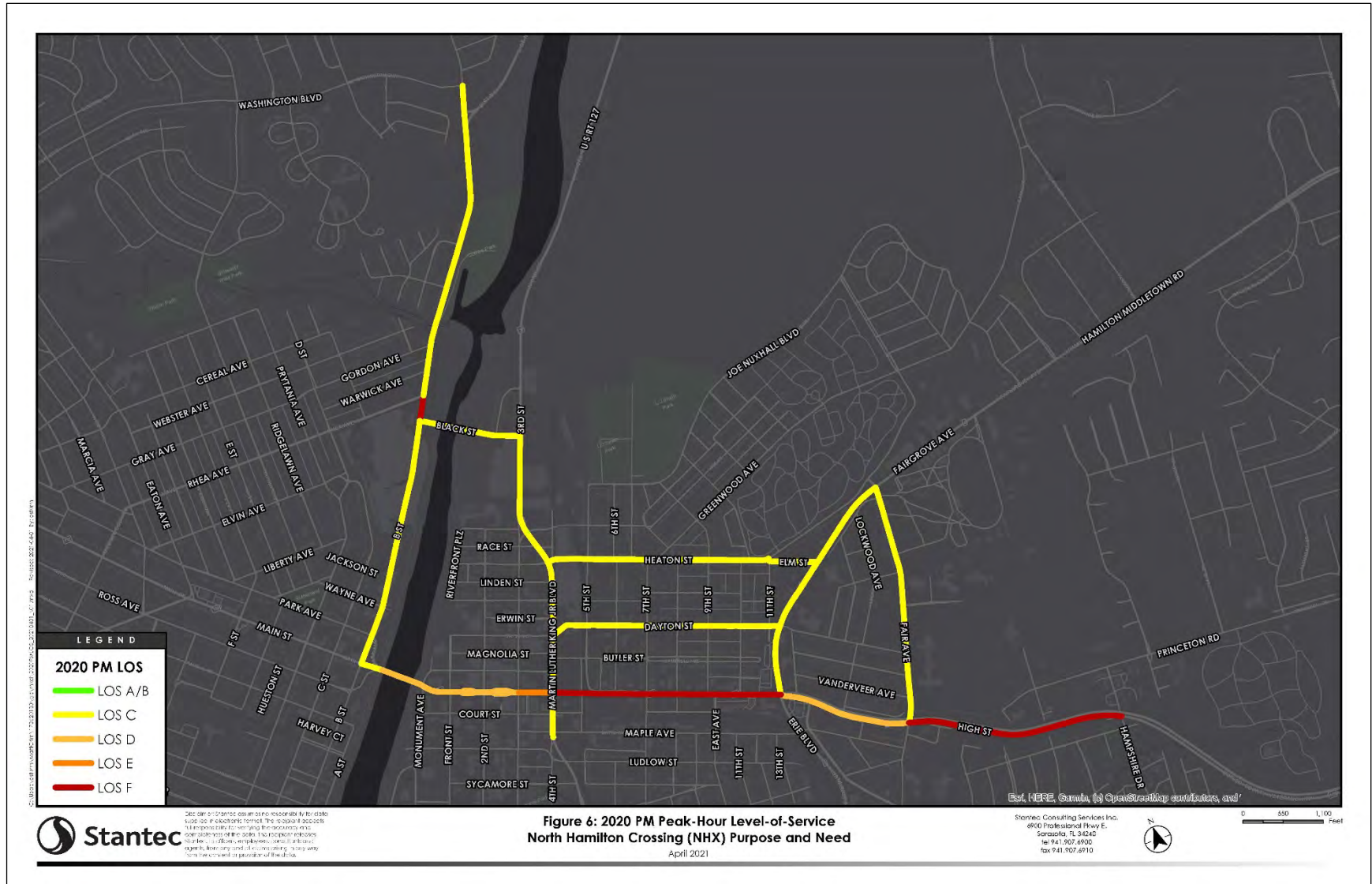


Table 7. 2030 Opening Year Intersection Operations

Intersection	Intersection Control	Time Period	Overall Intersection		Max v/c Ratio	Approach LOS			
			Delay (sec/veh)	LOS		EB	WB	NB	SB
SR 129 (Main St) & B St	Signal	AM	227.7	F	1.78	F	B	E	F
		PM	30.0	C	0.90	C	B	D	C
SR 129 (Main St/High St) & Monument St	Signal	AM	2.3	A	0.63	A	A		D
		PM	3.0	A	0.70	A	A		B
SR 129 (High St) & Front St	Signal	AM	20.3	C	0.90	B	B	E	E
		PM	27.1	C	1.03	B	C	F	E
SR 129 (High St) & 2nd St	Signal	AM	10.7	B	0.54	A	A	E	E
		PM	20.4	C	0.81	B	B	E	E
SR 129 (High St) & 3rd St	Signal	AM	9.8	A	0.67	A	A	E	F
		PM	18.6	B	0.83	B	B	E	E
SR 129 (High St) & US 127 (MLK Jr Blvd)	Signal	AM	91.5	F	1.40	E	D	F	F
		PM	124.6	F	1.34	F	F	F	F
SR 129 (High St) & 7th St	Signal	AM	8.6	A	0.79	A	A	E	E
		PM	16.9	B	0.92	A	B	F	F
SR 129 (High St) & East Ave	Signal	AM	13.7	B	0.86	B	A	E	
		PM	13.4	B	0.91	A	B	E	
SR 129 (High St) & SR 4 (Erie Blvd)	Signal	AM	50.0	D	0.94	D	D	F	E
		PM	83.9	F	1.15	E	F	F	F
SR 129 (High St) & Fair Ave	Signal	AM	28.4	C	0.94	C	B	E	E
		PM	48.8	D	1.35	C	D	D	F
SR 129 (High St) & Hampshire Dr	Signal	AM	21.2	C	0.77	B	B	E	E
		PM	57.0	E	1.17	C	D	F	F
Elkton Rd & NW Washington Blvd	Stop	AM	n/a	n/a	0.97	E		A ¹	
		PM	n/a	n/a	0.70	C		A ¹	
Elkton Rd & N B St	Stop	AM	n/a	n/a	1.67		F		A ¹
		PM	n/a	n/a	1.40		F		A ¹
N B St & Rhea Ave	Signal	AM	59.3	E	1.10	F		D	E
		PM	60.3	E	1.15	F		D	E
N B St & Black St	Signal	AM	61.8	E	1.15		B	F	E
		PM	65.5	E	1.10		D	F	E
N B St & Park Ave	Signal	AM	39.3	D	0.94		D	C	E
		PM	70.4	E	1.14		E	E	F
US 127 (N 3rd St) & Black St	Signal	AM	43.5	D	1.10	E	C	C	C
		PM	23.1	C	0.97	C	D	B	B
US 127 (MLK Jr Blvd) & Heaton St	Signal	AM	10.5	B	0.82	E	E	A	A
		PM	23.1	C	0.91	D	E	C	B
US 127 (MLK Jr Blvd) & Dayton St	Signal	AM	40.3	D	1.02	B	B	B	D
		PM	18.6	B	0.89	C	D	A	B
US 127 (MLK Jr Blvd) & Maple Ave	Signal	AM	12.5	B	0.53	C	C	B	B
		PM	10.6	B	0.52	C	C	A	A
SR 4 (Erie Blvd) & Fair Ave	Signal	AM	17.7	B	0.50	A	A	D	D
		PM	23.3	C	0.77	B	B	D	E
SR 4 (Erie Blvd) & Dayton St	Signal	AM	19.3	B	0.83	E	E	A	B
		PM	20.2	C	0.83	E	E	A	B

Delay reported for left turn movement



Table 8. 2050 Design Year Intersection Operations

Intersection	Intersection Control	Time Period	Overall Intersection		Max v/c Ratio	Approach LOS			
			Delay (sec/veh)	LOS		EB	WB	NB	SB
SR 129 (Main St) & B St	Signal	AM	362.8	F	2.34	F	C	E	F
		PM	57.9	E	1.17	F	C	D	C
SR 129 (Main St/High St) & Monument St	Signal	AM	2.5	A	0.63	A	A		D
		PM	3.4	A	0.78	A	A		B
SR 129 (High St) & Front St	Signal	AM	35.6	D	1.16	C	C	F	E
		PM	23.4	B	0.91	B	C	E	E
SR 129 (High St) & 2nd St	Signal	AM	14.4	B	0.85	B	B	E	E
		PM	26.4	C	0.98	B	C	E	E
SR 129 (High St) & 3rd St	Signal	AM	12.1	B	0.81	B	A	E	E
		PM	26.2	C	1.05	B	C	F	E
SR 129 (High St) & US 127 (MLK Jr Blvd)	Signal	AM	155.9	F	1.58	F	E	F	F
		PM	207.5	F	1.55	F	F	F	F
SR 129 (High St) & 7th St	Signal	AM	13.3	B	0.96	B	A	E	E
		PM	47.3	D	1.48	B	E	F	F
SR 129 (High St) & East Ave	Signal	AM	18.3	B	1.00	C	A	E	
		PM	39.2	D	1.09	B	E	F	
SR 129 (High St) & SR 4 (Erie Blvd)	Signal	AM	85.4	F	1.34	E	E	F	F
		PM	147.3	F	1.38	F	F	F	F
SR 129 (High St) & Fair Ave	Signal	AM	71.6	E	1.18	F	C	E	F
		PM	105.7	F	1.55	D	F	D	F
SR 129 (High St) & Hampshire Dr	Signal	AM	34.4	C	1.21	C	B	F	E
		PM	110.1	F	1.59	E	F	F	F
Elkton Rd & NW Washington Blvd	Stop	AM	n/a	n/a	1.24	F		A ¹	
		PM	n/a	n/a	1.67	F		A ¹	
Elkton Rd & N B St	Stop	AM	n/a	n/a	3.61		F		A ¹
		PM	n/a	n/a	4.30		F		A ¹
N B St & Rhea Ave	Signal	AM	114.8	F	1.42	F		F	F
		PM	121.3	F	1.23	F		F	F
N B St & Black St	Signal	AM	136.4	F	1.49		B	F	F
		PM	138.7	F	1.36		F	F	F
N B St & Park Ave	Signal	AM	74.2	E	1.17		E	E	F
		PM	147.5	F	1.46		F	F	F
US 127 (N 3rd St) & Black St	Signal	AM	92.6	F	1.39	F	D	C	C
		PM	44.8	D	1.14	C	D	D	D
US 127 (MLK Jr Blvd) & Heaton St	Signal	AM	12.9	B	0.85	D	E	A	A
		PM	45.8	D	1.09	D	F	D	C
US 127 (MLK Jr Blvd) & Dayton St	Signal	AM	82.6	F	1.21	B	B	B	F
		PM	27.6	C	1.07	C	F	B	C
US 127 (MLK Jr Blvd) & Maple Ave	Signal	AM	13.8	B	0.63	C	C	B	B
		PM	11.7	B	0.53	C	C	A	A
SR 4 (Erie Blvd) & Fair Ave	Signal	AM	20.2	C	0.56	B	B	D	D
		PM	30.1	C	0.87	C	C	D	E
SR 4 (Erie Blvd) & Dayton St	Signal	AM	21.2	C	0.82	E	E	A	A
		PM	23.9	C	0.84	D	E	B	C

Delay reported for left turn movement



Table 9. Existing (2020), Opening Year (2030), and Design Year (2050) Roadway Segments Level of Service (LOS)

Road Segment	Number of Lanes	2020 Existing		2030 Opening		2050 Design	
		AM LOS	PM LOS	AM LOS	PM LOS	AM LOS	PM LOS
SR 129 (Main St / High St)							
B St to Park Ave	2	C	C	F	F	F	F
Park Ave to Monument Ave	6	D	D	D	D	D	E
Monument Ave to Front St	4	D	D	E	F	F	F
Front St to 2nd St	4	D	D	F	F	F	F
2nd St to 3rd St	4	D	D	F	F	F	F
3rd St to US 127	4	D	E	F	F	F	F
US 127 to 7th St	4	C	F	F	F	F	F
7th St to East Ave	4	C	F	F	F	F	F
East Ave to SR 4	4	C	F	F	F	F	F
SR 4 to Fair Ave	4	C	D	D	F	F	F
Fair Ave to Hampshire Dr	4	C	F	D	F	F	F
N B Street							
Washington Blvd to N B St	2	C	C	C	D	D	F
N B St to Rhea Ave	2	C	C	C	D	D	F
Rhea Ave to Black St	2	D	F	F	F	F	F
Black St to Park Ave	2	C	C	C	C	C	C
Park Ave to SR 129	2	C	C	C	C	C	C
US 127 (MLK Jr Blvd / N 3rd St)							
Black St to Heaton St	4	C	C	C	C	C	E
Heaton St to Dayton St	4	C	C	C	C	C	C
Dayton St to SR 129	4	C	C	C	C	C	C
SR 129 to Maple Ave	4	C	C	C	C	C	C
Black Street							
N B St to US 127	2	C	C	D	F	F	F
Heaton Street							
US 127 to Erie Blvd	2	C	C	C	C	C	C
Dayton Street							
MLK to Erie Blvd	2	C	C	C	C	C	C
SR 4 (Erie Blvd)							
Fair Ave to Dayton St	4	C	C	C	C	C	C
Dayton St to SR 129	4	C	C	C	C	C	C
Fair Avenue							
SR 4 to SR 129	2	C	C	C	C	C	C

Source: Stantec, 2021

Street and the Black Street Bridge are also expected to operate at LOS F during the PM peak hour by the design year of 2050. The 2030 and 2050 roadway Level of Service analysis is summarized in **Table 9**.

3.5 SAFETY

Improving safety is also a primary transportation need within the study area and the current issues are highly correlated with congestion. A Crash Analysis was conducted for the 22 intersections within the study



area for the period between January 1, 2016 and October 31, 2020. **Table 10** provides a summary of the crash data. Over the five-year period, crashes ranged from a low of 12 to a high of 182. There were a total of four fatalities: two at the SR 129 & Fair Avenue intersection, one at the SR 129 & Hampshire Drive intersection, and one at the US 127 (MLK Jr. Blvd.) & Heaton Street intersection. Of the 1,254 total crashes reported, approximately 43% were rear-end collisions, which are typically congestion-related. Of the intersections within the study area, four are listed in ODOT's Highway Safety Improvement Program's 500 priority urban intersections. These intersections and their statewide ranking are:

- SR 129 & 7th Street - #24
- SR 129 & SR 4 (Erie Blvd) - #31
- SR 129 & US 127 (MLK Jr. Blvd) – #40
- SR 129 & B Street - #57

Safety of vehicles traveling through the study area was also identified as a transportation concern by 412 (49%) Needs Survey respondents.

Safety at Railroad Crossings

At-grade railroad crossings present a safety issue for both pedestrians and motorists. As observed by the Stantec team, at least 38 trains pass through Hamilton daily. This creates the potential for crashes at 26 at-grade crossings in the City. Despite technological advances in warning devices, at-grade crossing risks remain. Butler County has some of the most dangerous rail crossings in the State of Ohio. In 2016, there were seven crashes and three deaths, making Butler County the deadliest in the state (Ohio Public Utilities Commission, 2016). Between 2014 and 2018, the City of Hamilton had three reported crashes involving pedestrians and trains and one crash involving a bicyclist and train. (City of Hamilton and ODOT, 2020).

4.0 SECONDARY NEEDS

The project's secondary transportation needs include the following:

4.1 ECONOMIC DEVELOPMENT

Over the past decade, the City of Hamilton has been actively working toward attracting businesses to its urban core to replace the jobs and tax revenue lost with the decline of its manufacturing sector. More than \$188 million has been invested into downtown redevelopment projects since 2013 in addition to over \$247 million invested by private companies. These dollars have translated into over 1.25 million square feet of redeveloped space in the urban core, leading to 76 new small businesses and 188 new downtown residential units (City of Hamilton, 2020). This economic resurgence has attracted larger private investment to Hamilton. **Table 11** provides a summary of major economic development projects which have been recently completed, as well as projects which are included in the City of Hamilton's 2020 Action Plan.

Major projects undertaken include the opening of new facilities for 80 Acres Farms and JWF Technologies in the Hamilton Enterprise Park in 2019. Kettering Health Network opened Hamilton Health Center on Main, an 18,000 square foot, \$6 million primary care center on the west side of Hamilton. In addition, Hamilton Caster opened a new \$7.3 million, 50,000 square-foot facility in 2020.



Table 10. Crash Data Summary (1/1/2016 – 10/31/2020)

Intersection	Total Crashes	Fatal Crashes	Crash Pattern		
			Primary	Secondary	Tertiary
SR 129 (Main St) & B St	93	--	EB Rear End (19)	EB Angle (14)	WB Rear End (14)
SR 129 (Main St/High St) & Monument St	34	--	WB Rear End (13)	EB Rear End (8)	WB Sideswipe (5)
SR 129 (High St) & Front St	37	--	WB Rear End (10)	EB Rear End (7)	EB Left Turn (3)
SR 129 (High St) & 2nd St	34	--	EB Rear End (11)	WB Rear End (4)	WB Sideswipe (3)
SR 129 (High St) & 3rd St	58	--	EB Rear End (25)	EB Sideswipe (7)	WB Rear End (6)
SR 129 (High St) & US 127 (MLK Jr Blvd)	159	--	WB Rear End (33)	EB Rear End (28)	WB Left Turn (11)
SR 129 (High St) & 7th St	118	--	EB Rear End (33)	WB Rear End (25)	WB Left Turn (8)
SR 129 (High St) & East Ave	83	--	EB Rear End (46)	WB Rear End (13)	Pedestrian(4)
SR 129 (High St) & SR 4 (Erie Blvd)	182	--	EB Rear End (32)	NB Rear End (26)	WB Rear End (17)
SR 129 (High St) & Fair Ave	66	2	WB Rear End (25)	EB Rear End (11)	SB Rear End (4)
SR 129 (High St) & Hampshire Dr	115	1	EB Rear End (25)	WB Rear End (16)	EB Left Turn (13)
Elkton Rd & NW Washington Blvd	17	--	EB Rear End (7)	EB Fixed Object (3)	NB Left Turn (2)
Elkton Rd & N B St	25	--	SB Rear End (9)	SB Left Turn (4)	SB Angle (3)
N B St & Rhea Ave	15	--	SB Rear End (5)	EB Rear End (3)	EB Right Turn (3)
N B St & Black St	32	--	WB Rear End (9)	NB Rear End (6)	SB Rear End (4)
N B St & Park Ave	26	--	WB Angle (9)	WB Sideswipe (5)	EB Pedestrian(1)
US 127 (N 3rd St) & Black St	45	--	EB Rear End (9)	NB Rear End (7)	NB Left Turn (5)
US 127 (MLK Jr Blvd) & Heaton St	28	1	WB Ped/Bike (5)	WB Rear End (4)	NB Left Turn (3)
US 127 (MLK Jr Blvd) & Dayton St	20	--	NB Left Turn (5)	EB Left Turn (2)	SB Angle (2)
US 127 (MLK Jr Blvd) & Maple Ave	12	--	SB Angle (3)	WB Rear End (2)	WB Pedestrian (1)
SR 4 (Erie Blvd) & Fair Ave	22	--	EB Angle (4)	WB Left Turn (2)	NB Rear End (2)
SR 4 (Erie Blvd) & Dayton St	33	--	EB Rear End (3)	SB Rear End (3)	SB Angle (3)

Source: ODOT GCAT Crash Analysis Tool, 2021.



Table 11. City of Hamilton Development Projects

Completed Projects	Investment Cost
Artspace Lofts – 4,650 sq. ft. Mixed-Use Housing/Commercial	\$11.8M
Marcum Apartments – 102 units with 11,000 sq.ft. retail	\$13M
JWF Technologies- Manufacturing	\$4.25M
Hamilton Health on Main- Health Care	\$6M
The Davis Building - Residential	\$1.8M
27 new small businesses – restaurants, food establishments, retail, and entertainment	N/A
RiversEdge Amphitheater – 3,000 person entertainment venue	\$1.9M
Salvagnini – Manufacturing	\$7.0 M
Darana Hybrid – Manufacturing	\$6 +M
Hamilton Caster - Manufacturing	\$7.3M
TriHealth Bethesda Butler (Cancer Center)	\$5+M
Ft. Hamilton Hospital (Equipment, Infrastructure & Capital)	\$14.0 M
Ongoing Projects	Investment Cost
Third & Dayton Building – 70 residential units	\$5M
Rossville Flats – 75+ apt. units and 4 commercial spaces)	\$11M
Spooky Nook Sports Champion Mill – Entertainment/Convention/Hotel/Restaurants	\$144M



Completed Projects	Investment Cost
Agave & Rye - Restaurant	\$2.5M
Saica – Manufacturing	\$72M
80 Acres Farms – Indoor Farming	\$26+M

Source: City of Hamilton, 2020 Action Plan and City of Hamilton Economic Development Dept.

In addition, a private developer is redeveloping the former Champion Mill property along North B Street and the Great Miami River into the Spooky Nook Sports complex, a 500,000 sq. ft. multiuse development which will include courts and fields for soccer, volleyball, basketball, baseball, and field hockey, a 225-room hotel, and 55,000 sq. ft. of retail/restaurant/conference space. The complex, which will open in 2022, is expected to attract over 20,000 people in a single weekend day and a million visitors a year to Hamilton (Cincinnati Enquirer, 2020). In addition, it is anticipated that other businesses including hotels, restaurants and gas stations will be developed in the area to meet the needs of the facility’s visitors. Based on the Spooky Nook Traffic Impact Study, it is estimated that the development will generate approximately 1,250 new PM peak-hour trips (TEC Engineering, Inc., 2019). SR 129 will provide important regional access to the site (including access to Interstate 75), further contributing to the congestion on this roadway. Without an additional continuous east-west route, congestion on SR 129 will continue to worsen

Input received from the Visioning Exercise and Public Needs Survey also support the inclusion of economic development as a secondary need. Thirty-one percent (31%) of City/County stakeholders indicated that the project should support economic growth and 6% of stakeholders indicated that economic development is a desired outcome for the NHX project. (See **Tables 1 and 2**) In addition, numerous comments received from the Public Needs Survey identified concerns that traffic congestion would worsen when the Spooky Nook development was completed. This feedback also confirms the need for the NHX project to support economic development.

4.2 IMPROVE BIKE/PEDESTRIAN CONNECTIVITY

A secondary transportation need of the City of Hamilton, as identified in *Plan Hamilton*, is to improve bike/pedestrian connectivity within the City and build connections to the broader regional and state trail system, including the Miami 2 Miami Regional Trail (City of Hamilton, 2019). *Plan Hamilton* also identified the goal to make Hamilton a walkable city by requiring pedestrian amenities with new developments, prioritizing sidewalk improvements, and ensuring all residents have safe and accessible connections to community facilities and services. The Plan identified the need to connect bicycle and pedestrian facilities to the future Spooky Nook Sports complex.

The City of Hamilton has several trail facilities. These include the Great Miami River Recreational Trail (GMRRT), which traverses along the Great Miami River, and a short segment of bike trail on the west side of the Great Miami River in Downtown Hamilton. The City has also proposed the Beltline trail, which would utilize former CSX railroad property and provide a 2.96-mile bicycling and walking trail through the City’s



west side and connect directly to the proposed Spooky Nook Sports development. It is a goal of the City to provide a connection between the proposed Beltline trail on the west side of the Great Miami River to the GMRRT on the east. Long-range trail plans show the GMRRT connecting with the Miami 2 Miami Regional Trail, linking Hamilton in Butler County to Mason in Warren County.

Sidewalk facilities exist in much of the City, including downtown and several surrounding neighborhoods. However, the presence of at-grade rail lines present conflicts for pedestrians and bicycles. Improved bicycle and pedestrian connections are needed, particularly a connection across the Great Miami River and over the railroad tracks to improve accessibility between Spooky Nook Sports, the Central Business District, and other amenities in the area. Improved connectivity to existing bike trails will improve access to regional bike trails over the long-term.

Based on input received during the Visioning Exercise and shown on **Table 2**, 31% of stakeholders indicated that a goal of the project is to provide for all transportation modes. In addition, **Table 3** shows that 413 (49%) of Public Survey respondents indicated that safety for pedestrians is a concern and 358 (43%) indicated that safety for bicyclists is a concern. A total of 352 (42%) of respondents indicated that a lack of dedicated bike routes is a transportation concern. These sentiments support the addition of improved bicycle/pedestrian connectivity as a secondary need for this project.

4.3 IMPROVE MULTIMODAL LINKAGE

The improvement of multimodal linkage is also a secondary transportation need of the NHX project. As stated in *Plan Hamilton*, the City has made it a goal to encourage alternative modes of transportation to improve mobility and decrease traffic congestion. In addition to expanding opportunities for bicycle/pedestrian users as discussed above, the City wants to improve and expand bus transportation opportunities to connect transit-dependent individuals to jobs. The median household income of Hamilton is \$43,280, compared to \$61,870 for the surrounding Cincinnati metro area. In addition, 19.4% of Hamilton residents have incomes below the federal poverty level – approximately 1.5 times the rate of the surrounding Cincinnati metro area. Within Hamilton, 9.6% of households have no vehicle available and 41.3% have only one vehicle available (City of Hamilton and ODOT, 2020). Therefore, half of households in Hamilton rely on other modes of transportation all or part of the time. A transportation need of the City is to provide pedestrian, bicycle, and automobile connectivity to the bus system to support greater transit use. The Butler County Regional Transit Authority's (BCRTA) Hamilton transit hub, located on Market Street between North 2nd and North 3rd Streets, is less than a mile from the NHX project area. Bus lines that travel both east and west throughout the county pass within walking distance of this project area. Improving east-west connectivity in the City of Hamilton would increase access to BCRTA's transit hub and improve bus service through the City.

As shown on **Table 2**, the desire to provide for all modes of transportation was identified as an important goal of the NHX project by 31% of the stakeholders who participated in the Visioning Exercise. In addition, 368 (44%) of the respondents of the Public Needs Survey identified limited access to transit as a transportation concern in the City of Hamilton, as shown on **Table 3**. These results support the inclusion of multimodal linkage improvement as a secondary transportation need of the project.



5.0 LOGICAL TERMINI AND INDEPENDENT UTILITY

5.1 LOGICAL TERMINI

Logical termini for project development are generally defined as 1) rational end points for a transportation improvement, and 2) rational end points for a review of the environmental impacts. The eastern terminus of the project extends approximately from the vicinity of Hampshire Drive and SR 129 and parallels the City's eastern boundary until connecting with SR 4 and the western terminus is North B Street, west of the Great Miami River. These termini were established to provide a project area large enough to evaluate several alternative east-west routes through the City of Hamilton, which has numerous areas of potential environmental concern including several cemeteries, parks, schools, regulated materials concerns, and neighborhoods of underserved populations. In developing the logical termini, consideration was also given to allow options for Great Miami River crossings and grade-separated rail crossings. These termini are discussed below.

East Terminus at the Intersection of SR 129 and Hampshire Drive: This terminus is logical as the point at which SR 129 transitions into a limited-access highway. This intersection and the areas of SR 129 to the west are areas of severe congestion and high accident rates. SR 129 connects Hamilton to Interstate 75 (I-75) to the east.

West Terminus at North B Street: This terminus is logical because it includes the crossing of the Great Miami River, which has been identified as a transportation need due to the lack of capacity in the existing bridges. In addition, O-D data indicate that North Black Street is an important route for collecting and dispersing traffic in west Hamilton.

5.2 INDEPENDENT UTILITY/PROJECT PHASING

The proposed project is not dependent on other planned improvements for the surrounding transportation network and does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements in the proposed project area. Therefore, independent utility is established for the proposed project.

Based on the O-D study performed for this project and summarized in **Table 5**, there is a need to extend this project between SR 129 and North Hamilton, as approximately 30% of motorists originating at SR 129 (Butler Regional Highway) are currently using the Black Street Bridge, indicating that almost one-third of traffic is traveling through the City to points north of Hamilton. Due to the size of the project area and anticipated costs of needed transportation improvements, i.e. a new bridge and grade-separated railroad crossing, it is anticipated that this project will be built in phases as funding becomes available. The phases which have been identified are briefly described as follows:

Phase 1: The first phase of the NHX project will focus on addressing the primary impediments to east-west travel through the northern portion of the City of Hamilton, namely the lack of river crossings and the lack of grade-separated railroad crossings, both identified as Primary Needs of this project. As discussed in Sections 3.2 and 3.3, the bottlenecks which occur due to the lack of river crossing options and railroad crossings are underlying causes of the transportation needs to improve congestion and safety. It is



anticipated that Phase 1 will be the focus of the initial planning, design, and construction efforts of the NHX project; Phases 2 and 3 will be implemented as funding becomes available.

Phase 2: This phase will address east-west connectivity between Phase 1 and SR 4, a major regional north-south highway that provides connections to SR 747 and SR 63, regional highways located approximately five miles and 7.5 miles, respectively, to the east. As shown in **Table 5**, approximately 45% of the traffic from SR 4 north of Fair Avenue utilizes the Black Street Bridge to travel to points north of Hamilton, showing that connectivity from this location to a new river crossing to be constructed in Phase 1 is needed.

Phase 3: This phase will address transportation needs between the terminus of Phase 2 at SR 4 to a connection with SR 129 (Butler Regional Highway). SR 129 connects directly with I-75, a major north-south interstate located approximately ten miles to the east. **Table 5** shows that approximately 30% of Hamilton traffic travels from SR 129 east of Hampshire Drive to points north of Hamilton. Therefore, the completion of a connection to SR 129 as it enters the City's southeast quadrant is needed to meet travel demand originating from this side of the City. In addition, by making this final connection, motorists will be able to take an optional route from SR 129 as it enters the City to access locations in north Hamilton, rather than remaining on SR 129 (Main St/High St) through the City, reducing congestion on SR 129.



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