HAMILTON ROAD EAST-WEST CONNECTION

Better Utilizing Investments to Leverage Development
in the City of Bloomington, Illinois

Total Project Cost: $7,750,000 | BUILD 2020 Request: $5,425,000 | Local Match: $2,325,000

Eligibility: Local Government, Rural Classification

CITY OF Bloomington ILLINOIS

JEWEL OF MIDWEST CITIES

Table of Contents

1. Project Description

1.1 Project Description

The City of Bloomington, Illinois, requests **$5,425,000** in federal funds from the United States Department of Transportation (USDOT) Better Utilizing Investment to Leverage Development (BUILD) Transportation Discretionary Grants program to build the **$7,750,000 Hamilton Road East-West Connection project (Hamilton Connection).** BUILD funding for the Hamilton Connection would amount to a **70 percent** federal share. Bloomington has approved **$2,325,000** in local funds, providing a non-federal share of **30 percent**, to this project.

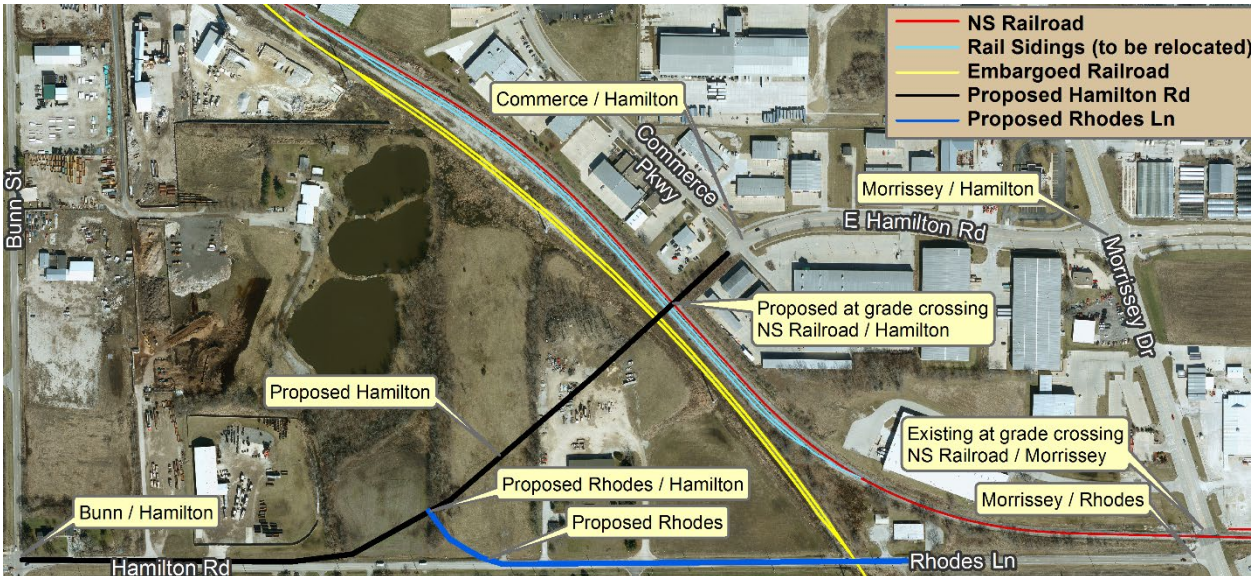


Figure 1: Project overview

The Hamilton Connection project (Figure 1) represents the final connection of a 7.2-mile east-west transportation corridor improvement along the south portion of Bloomington on Hamilton Road and Fox Creek Road. This final Hamilton Connection comprises 3,000 linear feet of new roadway, from Bunn Street to Commerce Parkway, plus widening of Hamilton from Commerce to Morrissey Drive along approximately 1,000 linear feet east of the new street section.

The project will provide safer, easier roadway travel, especially at the Morrissey Dr, Rhodes Lane, and Norfolk Southern Railway confluence, with reduced traffic load on the Interstate 55 Business (Veterans Parkway). In addition, the project will facilitate multimodal travel by completing a Constitution Trail shared-use path along the corridor and creating the potential for more safe and efficient mass transit connections. Finally, the project will boost economic development opportunities in the project area, enhancing access to existing employers and sparking new development along the completed Hamilton Road corridor. The project website, which includes all attachments, a video introduction, and letters of support, is located at www.BUILDingBloomington.com. Click here for a direct link to the video.

If the project is not built, traffic will continue using the same routes and increase the congestion and safety concerns solved by the project. The multimodal amenities in the area would also remain disconnected, removing opportunities for pedestrians, bicyclists, and transit. In addition, the lack of an updated road with a more direct link to and from businesses, amenities, and users could stifle economic development in the area.

Long-Term Planning: Bloomington is committed to upgrading City infrastructure and facilities, growing the local economy, and furthering the City's goal to remain a great place and a livable, sustainable city. The proposed project would help the City achieve those goals, which are outlined in the Strategic Plan 2010-2025. The project would also further the transportation goal in the Comprehensive Plan 2015-2035 to promote a safe and efficient network of streets, bicycle-pedestrian facilities, and other infrastructure to serve users in any surface transportation mode.

Previous Application: Bloomington submitted an application for a BUILD grant for this project in 2019. While the City did not receive the grant, officials at the USDOT debriefed city officials on ways to improve the application. The major recommendations from the Department were to improve formatting and sections, include additional information in the selection criteria sections, provide more evidence to prove benefits, and provide raw data for further evaluation by the USDOT. This application improves upon the previous application by addressing the recommendations discussed in the debrief meeting.

Roadway Users: Of note among users are workers for Bloomington's largest employer, State Farm. In total, State Farm employs approximately 14,200 people among its sites in Bloomington. The State Farm Corporate South campus is located along the eastern end of the Hamilton Road corridor and functions as a regional training center, centralized shipping and receiving hub for all Bloomington facilities, and as the nationwide information technology hub for the company. State Farm also operates a 200,000 square foot building materials research center on Rhodes Lane, which would benefit from the proposed project. In addition to this particular large user, the Hamilton Road/Fox Creek Road corridor also connects users to smaller businesses, parks, two municipal golf courses, residential subdivisions, and other services, including a new U.S. Department of Veterans Affairs outpatient medical clinic.

Figure 2: Google Earth view of State Farm Corporate South

Project Status: Phase I study has been completed. Phase II engineering has begun. Construction is anticipated to begin in spring 2021 and end in fall 2022 (accounting for winter shut down) if $5,425,000 BUILD discretionary grant funding is secured this year.

BUILD funding use: Funding from BUILD and the City of Bloomington's match will be used exclusively for construction (and not design or land acquisition).

Elements of the project are included in the Phase I Project Development Report, and are summarized below. A map of the project is show in Figure 1.

1.1.1 Five-Lane Highway with Bidirectional Turn Lane

The new section of Hamilton Road is planned as an asphalt street with five total travel lanes, two through lanes in each direction, and a bi-directional left turn lane. The street will be constructed as an urban section and include curb and gutter with accompanying storm sewer, improved culverts, and a detention basin (below). A 10-foot wide shared-use path will be north of the roadway and a five-foot sidewalk will be south of the roadway (below).

1.1.2 Shared-Use Path to Connect Constitution Trail

Just as the street construction will close the gap in Hamilton Road, the 10-foot wide shared-use path construction included as part of this project will close a gap that will connect a 7.2-mile section of the 45-mile network of the Constitution Trail. Designers are paying close attention to the construction details necessary for this shared-use path in close proximity to the roadway.

1.1.3 Termination of Rhodes Lane

Rhodes Lane will end in a cul-de-sac, closing its intersection with U.S. 150 at the confluence of Rhodes, U.S. 150 (Morrissey Drive), and a Norfolk Southern Railway crossing not involved in the project. Rhodes Lane, now rural construction, will be reconstructed as an urban street with curb and gutter, a 10-foot shared-use path, and a 5-foot sidewalk. The Norfolk Southern Railway crossing at U.S. 150 is currently ungated due to geometric issues with its close proximity to Rhodes Lane (See Figure 1). While not part of the proposed project, the closure of Rhodes Lane at the intersection will make a gated crossing feasible.

1.1.4 At-Grade Railroad Crossing

An at-grade railroad crossing will be constructed at the intersection of the Norfolk Southern Railway tracks and the Hamilton Road extension. Grade separation is not economically justifiable at the Hamilton intersection as a result of infrequent railroad usage. The crossings have five or less trains per day. As part of a separate project, two seldom-used Norfolk Southern Railway railroad sidings will be relocated so that railroad cars utilizing the sidings do not impede vehicular traffic in the new section. The sidings are shown in Figure 1. The at-grade crossing will have gates and barrier median as well as gates and flashers at the sidewalk and shared-use path. City and consultant engineers are working closely with the railroad personnel to assure that requirements of all parties are being met. More information on these efforts can be found in Section 5.3.

1.1.5 Signalization

Hamilton Road at Bunn Street will be reconstructed as a signal-controlled intersection. Hamilton Road at Commerce Parkway will be designed for signalization in the future, if needed. Hamilton Road at Morrissey Drive is currently signalized, and modifications will be made to accommodate additional lanes. The intersection design studies have been approved by the Illinois Department of Transportation (IDOT).

1.1.6 Stormwater Management

The area surrounding this segment of Hamilton Road has minimal slope and presents unique drainage considerations. Providing for the increased runoff associated with this project, a detention basin will be built adjacent to Hamilton Road.

1.1.7 Water Main

Water main will be constructed under the shared-use path to upgrade the water system in general (redundancy, looping, pressure) and to accommodate future development in the project area. The water main will increase the water system quality by connecting a loop from Bunn Street to Commerce Avenue.

1.2 Transportation Challenges Addressed by the Project

Challenge #1: Capacity Issues

The existing roadway network has insufficient capacity to convey the existing east/west traffic volumes because of a lack of route continuity between Bunn Street and Commerce Parkway. The existence of the Bunn-Commerce gap means east-west motorists use the cumbersome, high-crash intersection of Rhodes Lane-U.S. 150-Norfolk Southern Railway at-grade crossing to get from the east portion of Hamilton Road to the west portion, and vice versa.

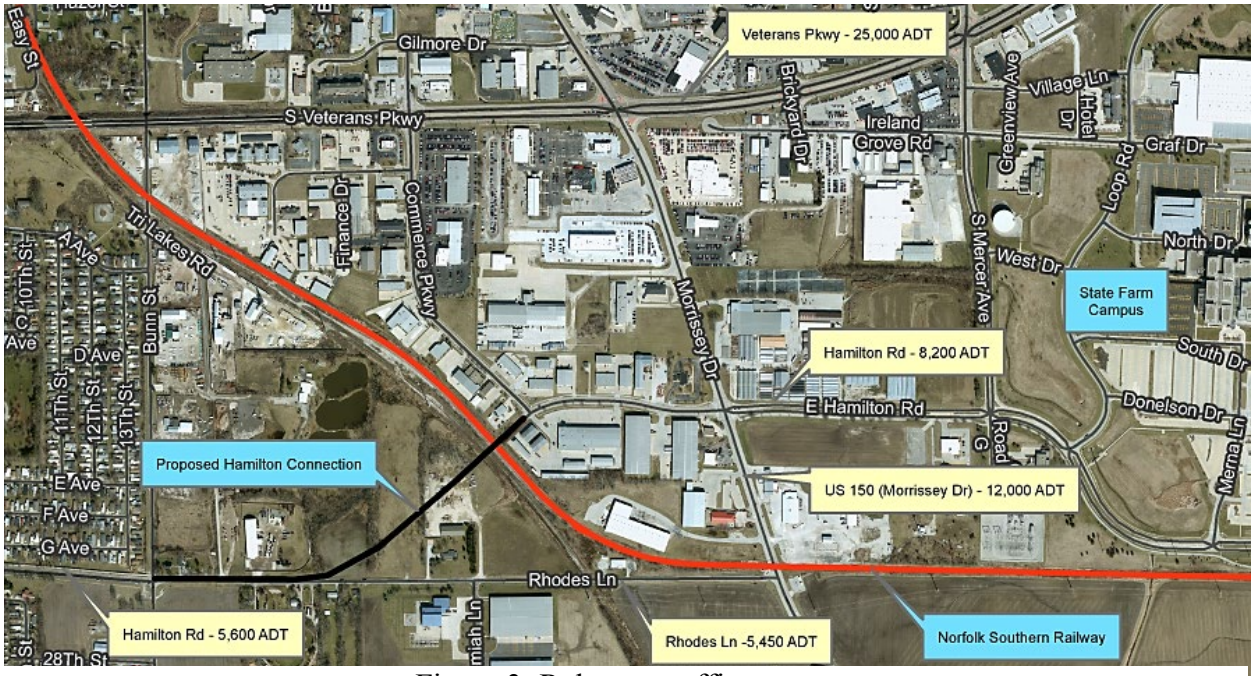


Figure 3: Relevant traffic counts

Alternatively, motorists use Veterans Parkway, rather than Hamilton Road, to reach their destinations along this south Bloomington corridor. This corridor includes the State Farm south campus, and the additional traffic adds to the congestion on Veterans Parkway.

Consequently, the existing Hamilton Road is an underutilized, urban, five-lane, arterial street that carries a modest 5,600 vehicles per day. At the western portion of the gap, at Bunn Street, Hamilton Road terminates and becomes Rhodes Lane. The current Rhodes Lane, from Bunn Street to Morrissey Drive, is a two-lane street with rural construction and is far over capacity at 5,450 vehicles per day.

The fact that this street is under capacity is clearly illustrated during each morning and evening commute. In the morning, traffic queues regularly extend a quarter of a mile and drivers show their impatience by making the left turn (north) onto Morrissey from Rhodes with little gap, or using the bi-directional left turn lane as an acceleration lane. In the evening, drivers are stuck in a long queue to turn left (south) onto Morrissey from Hamilton (Figure 4). These inefficiencies are a clear indicator of the need to complete the Hamilton Connection.

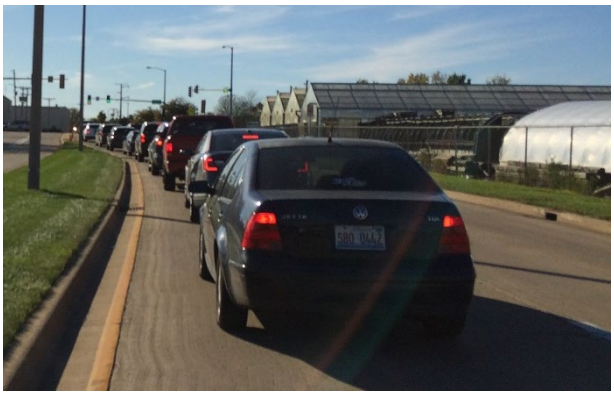


Figure 4: Evening traffic on Hamilton Rd

Solution #1: The Proposed Project Solves Capacity Issues

The Hamilton Connection project solves these capacity issues by connecting the west segment of Hamilton Road at Bunn Street to the east segment of Hamilton Road at Commerce Parkway.

In 2011, the City created a travel demand model (TDM) for the project area of the Southeast Bloomington Railroad Crossing and Transportation Study. This was created separately from the citywide model. City engineers used the TDM as a tool to replicate existing travel demands and forecast future travel demands throughout the project area bordered by Veterans Parkway (I-55 Business), Empire Street (Illinois 9), Towanda Barnes Road, and south of Interstate 74. The map is shown as Figure 3.1.3. in the referenced study on page 12.

The project area TDM, which was built by Hanson Professional Services using Cube. It is a standard, four-step travel demand model with mode choice removed from the computational process. Mode choice was removed, because so few trips within the region are completed using modes other than vehicles. The citywide model was built with 2010 socioeconomic data for land use, population, income, employment type, and the most current version of the road network. Attributes for the roadway network include number of lanes, posted speed limit, functional classification, and intersection controls. GIS files for the project area TDM are available online.

The study included three TDM scenarios to estimate effects on street network congestion. The study analyzed the proposed project with existing 2010 socioeconomic data and 2035 socioeconomic data. The study showed that, with the opening of the Hamilton Connection, traffic will immediately migrate to Hamilton Road, causing the existing average daily traffic volumes to double on day one. The study reviewed six separate alternatives for increasing mobility and promoting a safer transportation system. ***The recommendation of this study was to give Hamilton Road (Bunn Street to Commerce Parkway) high priority,*** as it is cost-effective in improving mobility and promoting safety.

Using the area TDM generated for the Southeast Bloomington study, and removing the possibility of an eastside interstate bypass (which was included in the study but has since been shelved), Hanson Professional Services provided updated tables. Table 1 summarizes the percent change of ADT of roads in the study area between the no build scenario and the build scenario.

Table 1: Roadway Capacity Improvement

Roadway Segment	2035 No Build TDM ADT	2035 Hamilton Road TDM ADT	% Change
Hershey	37,925	35,272	-7.0%
Morrissey	23,338	21,313	-8.7%
Ireland Grove	23,292	21,527	-7.6%
IL 9	36,868	31,501	-14.6%
Veterans Parkway	56,824	48,101	-15.4%

Hanson Professional Services used the project area TDM to calculate the amount of daily vehicle hours traveled on the Bloomington street network with and without the proposed Hamilton Connection. Table 2 shows that construction of the proposed improvements will provide more efficient traffic flow in the design year. The TDM estimated that the Hamilton Connection project will save travelers 9,900 minutes of travel time per day or approximately 60,773 hours per year.

Table 2: Travel Time Improvement Per Day

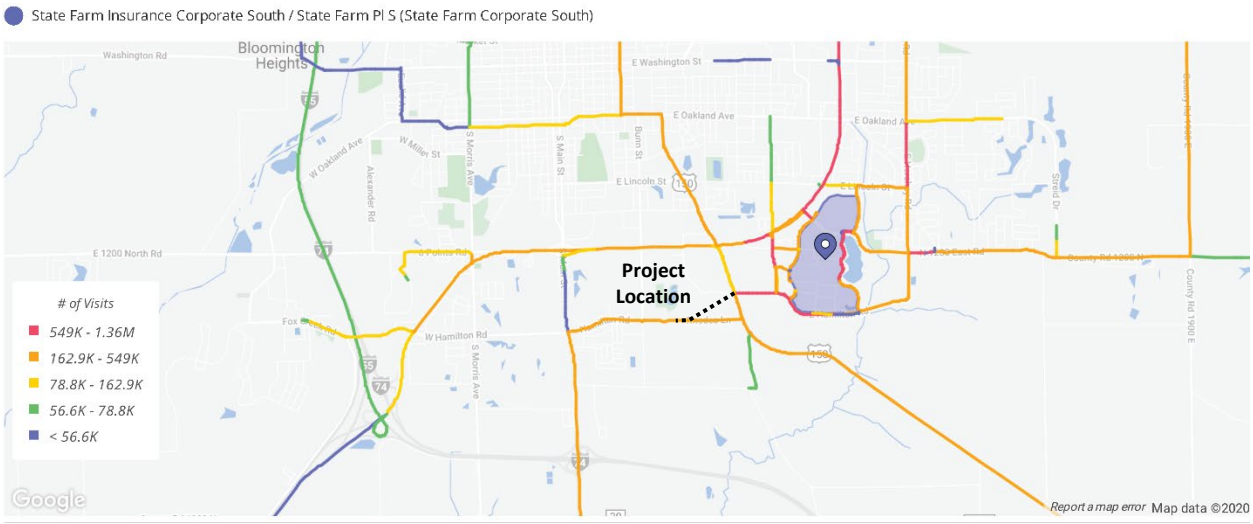
2035 TDM Network Scenario	Travel Time (Minutes)	% Difference
No Build	2,013,470	-
Hamilton Road (Bunn to Commerce)	2,003,480	-0.5%

A portion of the Southeast Bloomington study compared the relative cost-effectiveness of crossing the Norfolk Southern Railway mainline and siding tracks at-grade or with grade separation. Costs to relocate the existing sidings were included in the calculations. The study found that the added costs of the grade separation outweighed the benefits of increased mobility and safety of bridging Norfolk Southern Railway. Based on this data at-grade crossing at Hamilton Road and the Norfolk Southern mainline was the recommended solution.

While the numbers used in the Southeast Bloomington Railroad Crossing and Transportation Study and the tables above (using the project area TDM) do not specifically match the numbers used in the Benefit Cost Analysis in Section 6, they each use best practices of TDM policies, test

different scenarios, and find that that miles traveled and hours traveled are reduced by building the Hamilton Connection.

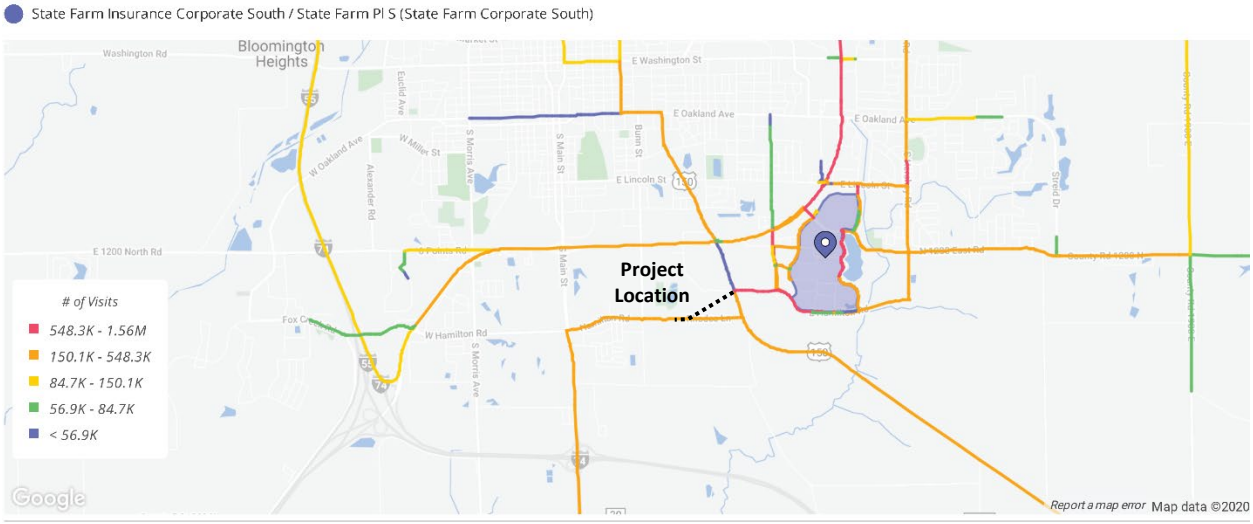
The Placer.ai data for the calendar year 2019 for workers at State Farm Corporate South indicate the highlighted routes are the most highly used to get to work (Figure 5) and home from work (Figure 6). The completion of the Hamilton Road Corridor would significantly alter the traffic patterns for these workers. This data reinforces Illinois Department of Transportation traffic counts which have been relied upon by City staff in past estimates of time savings and corresponding economic impacts that would result from the Hamilton Road project if funded as requested. Placer.ai tracks consumer data via smartphone apps and monitors the locations of over 20 million active devices and various platforms and metrics.



From Prior Location | Jan 1, 2019 - Dec 31, 2019 | Employees
Data provided by Placer Labs Inc. (www.placer.ai)

Figure 5: Morning Commute Mapping

Placer.ai



From Post Location | Jan 1, 2019 - Dec 31, 2019 | Employees
Data provided by Placer Labs Inc. (www.placer.ai)

Figure 6: Evening Commute Mapping

Placer.ai

Challenge #2: Roadway Safety

While State Farm is the largest single traffic generator in this area, school buses must also navigate this route. The following Unit 5 schools and their 3,564 students must navigate both sides of the Hamilton Road gap to transport their students: Brigham Elementary School (169 students), Cedar Ridge Elementary School (509 students), Evans Junior High School (795 students), and Normal Community High School (2,091 students) (www.greatschools.org).

The safety of the students as well as all motorists through this area will be improved by the elimination of one of the more dangerous intersections in Bloomington. Rhodes Lane terminates at an unsignalized T-intersection with Morrissey Drive (US 150) within 50 feet of the at-grade, ungated crossing of Morrissey Drive and the Norfolk Southern Railway (See Figures 7 and 8). The result of this configuration is that the intersection does not allow the installation of traffic signals, a barrier median, and railroad crossing gates, thereby significantly reducing its safety. Since Rhodes Lane is stop controlled with free flow through traffic on Morrissey Drive, motorists turning left onto Morrissey from Rhodes have large delays during rush hours. These delays not only create lengthy back-up traffic on Rhodes, but they cause motorists to choose to turn onto Morrissey when there is an insufficient gap or by using the bi-directional turn lane as an acceleration lane.

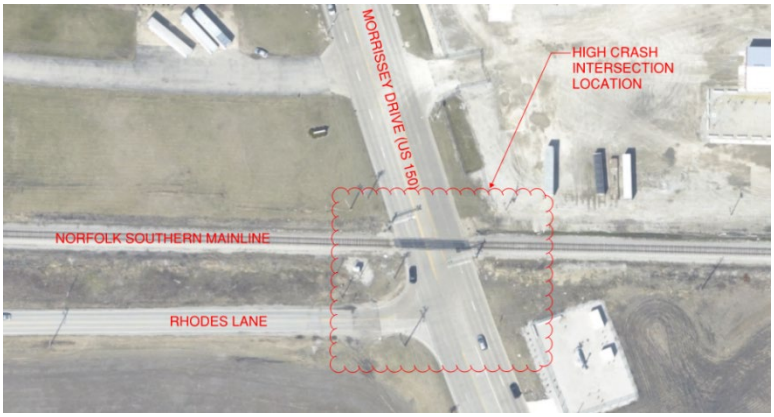


Figure 7: Morrissey Drive and Rhodes Lane Intersection

In addition to the Rhodes Lane T-intersection with Morrissey Drive (US 150), Hanson Professional Services analyzed all intersections involved in the Hamilton Connection project as part of the Phase I Project Development Report.


Figure 8: Rhodes, Morrissey, and NSR facing west

Over the 5-year period studied, the data shows:

- 66 crashes occurred within the project limits. Five were A injuries, eight were B injuries, seven were C injuries, and 46 crashes did not involve any injuries. No crashes resulted in a fatality.
- 31 of the crashes occurred at Rhodes Lane-Morrissey-NRS; 21 of the 31 crashes involved a vehicle that was attempting to turn left onto Morrissey Drive from Rhodes Lane (eastbound to northbound movement). Compromising weather was not a significant factor.

- The intersection of Morrissey Drive and Hamilton Road had 15 crashes in the 5-year period. Six of the crashes were rear-end collisions of vehicles traveling north or south along Morrissey Drive. Weather and directionality (northbound vs. southbound) did not have an influence in the rear-end collision trend at the intersection, so they were likely related to the traffic signal-induced speed differential.

Solution #2: The Proposed Project Addresses Safety

The safety analysis performed by Hanson Professional Services as part of the Phase I Project Development Report (and includes a Collision Spot Map) concluded:

- The collisions at Rhodes Lane and Morrissey Drive will be remedied by removing the Rhodes Lane intersection. A cul-de-sac is proposed on Rhodes Lane and the through traffic will instead take Hamilton Road to Morrissey Drive.
- The existing eastbound to northbound turning movement at the intersection will be eliminated as part of the proposed improvements. For the eastbound to northbound movement, the proposed Hamilton Road pavement will connect motorists to the signalized intersection at Morrissey Drive and provide a safer alternative for the northbound movement.
- The rear-end collisions at the intersection of Morrissey Drive and Hamilton Road may result from the large difference in major and minor road ADT. This difference will be reduced upon construction of the project.

An added project benefit is the ability to improve the existing Norfolk Southern and Morrissey Drive (US 150) at-grade crossing with gates and barrier median. Installing gates and a barrier median on proposed Hamilton Road is also an improvement over the existing condition because travelers using existing Rhodes Lane are now required to cross the Norfolk Southern without the added benefit of these warning devices.

In addition, the Benefit Cost Analysis found that property damage only crashes are reduced by 2.53 crashes per year and injury/fatality crashes are reduced by 1.15 crashes per year based on the improvements made to the three intersections. More details are provided in Section 6.1.1.3 Reduced Property Damage Only Crashes and Injury/Fatality Crashes.

Challenge #3: Barriers to Development

Bloomington's Comprehensive Plan 2035, adopted in 2015, identifies the project area and other nearby areas for future infill development. Envisioned land uses include employment centers, such as light industrial businesses; commercial, residential, and mixed-use neighborhoods; and conservation areas. Barriers to development include: One Norfolk Southern Railway main line, one embargoed Norfolk Southern Railway main line, and two railroad sidings at the proposed Hamilton Road crossing; inadequate street access to land; and an unsafe intersection at Rhodes Lane and Morrissey Drive (US 150).

Solution #3: The Proposed Project Facilitates Development

The Hamilton Connection project will address the lack of a street connection through undeveloped land. Economic benefits include the potential expansion of existing businesses and

creation of new businesses along Hamilton Road, east of Commerce Parkway, once arterial street and shared-use path access is continuous.

In 2011, the Southeast Bloomington Railroad Crossing and Transportation Study also included interviews with project stakeholders. The interviews obtained qualitative data regarding the needs of individual stakeholders looking to invest in the area or frequently traveling through the area. While they produced no development commitments, the interviews confirmed that the prospects for the Hamilton Connection does generate interest among both residential and commercial developers.

*Present Day:*The tan areas in Figure 9 are unincorporated. The City's plan is to encourage annexation of these areas and promote infill development. The completion of the Hamilton Connection is very likely to result in significant new private investment at multiple vacant infill development sites throughout the Hamilton Road/Fox Creek Road Corridor while also increasing customer traffic and sales at dozens of existing businesses along the corridor. Projections indicate that traffic volumes along the corridor will increase once the project is complete. These increased traffic volumes will be beneficial to existing auto-oriented businesses located throughout the corridor, including gas stations, convenience stores, and quick service restaurants with drive-thru lanes.

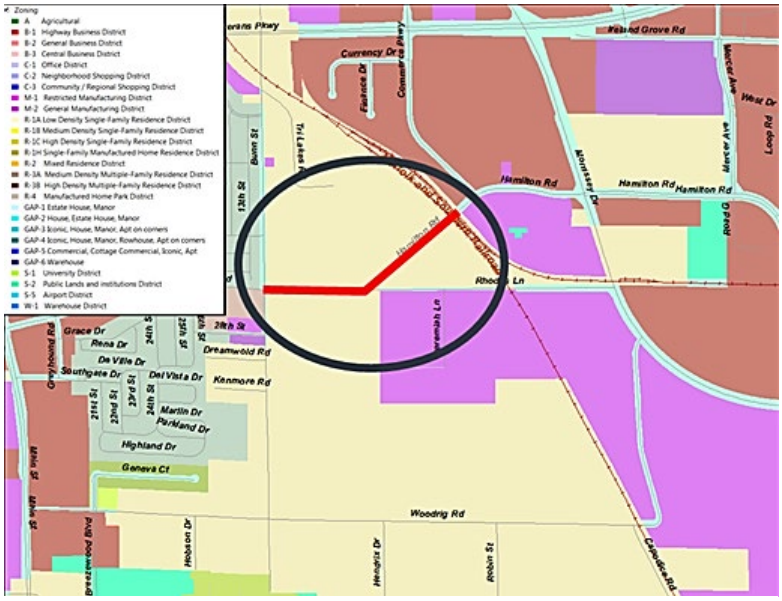


Figure 9: Comprehensive Plan Land Use

Existing businesses in the immediate vicinity of the Hamilton Connection are especially likely to experience significant traffic increases far outpacing existing daily averages due to the present lack of thru access. Completion of the Hamilton Connection will activate the immediate vicinity of the Project area, likely attracting private investment, which would lead to increased property values and increased retail and service transactions generating increased property tax and sales tax revenues for the city and other units of local government. For illustrative purposes, the impact to four sites along the Corridor is detailed in the included Potential Economic Benefits Memo from the city's Economic Development Department. The present-day condition of each site and potential project-enabled development opportunities are detailed.

Zoning and Land Use: Property surrounding the project area is zoned for business, manufacturing, and manufactured homes. The Future Land Use and Land Use Priorities maps,

found on pages 229-230 of the Comprehensive Plan 2015-2035 envisions annexations and development of these areas. Proposed uses are "employment centers" with office, industrial, or manufacturing uses; commercial activity centers; and new neighborhoods.

Challenge #4: Multimodal Transportation Continuity

Bloomington and its twin city, Normal, announced creation of the Constitution Trail during the nation's Bicentennial in 1976. The trail now measures about 45 miles, running primarily along former rail property and as shared-use paths. While serving as one of the cities' more popular amenities, Constitution Trail also serves as a transportation route. Periodic gaps exist, but the gap in the Constitution Trail on Hamilton Road, from Bunn to Commerce, is especially glaring. For bicyclists and pedestrians, there currently is no good route to get from the east portion of the Hamilton Road gap to the west portion, and vice versa, as Rhodes Lane and Morrissey Drive have gravel shoulders and no sidewalks. For persons with disabilities, there is no route, period. Also, while transit routes run near the area, there are no transit routes that run through the corridor. The lack of a safe connection in the gap from Bunn to Commerce limits the ability of buses to navigate the corridor.

Solution #4: The Project Addresses Multimodal Continuity

The Hamilton Connection includes new shared-use paths on the north side of the Hamilton extension, connecting the existing dead-ends at Bunn Street and Commerce Parkway. This portion of the shared-use path will be constructed as a 10-foot-wide share-use path with a grass parkway separating the street from the shared-use path. Five-foot-wide concrete sidewalk will be constructed on the south side of the new Hamilton Road section, also with a grass parkway separating it from motorists. Constitution Trail and sidewalk users also will be able to use Rhodes Lane, as both amenities are planned along the partially reconstructed Rhodes roadway. The project would also allow a point of connection to a regional trail that could be built along the embargoed main line, which would create a direct trail link to Champaign, Illinois and Urbana, Illinois and other communities. The Friends of the Constitution trail have started coordination with Norfolk Southern to make this regional trail happen. This group has provided input and support for the Hamilton Connection project.

Also of note, Bunn Street will be reconstructed for 400 feet to the north and 400 to the south of the Hamilton Road intersection. Bunn Street now has rural construction and no sidewalks. The newly paved area will have urban construction, with pedestrian accommodation adjacent to Hilltop Mobile Homes and Cardinal Ridge, which currently have no pedestrian/bicycle access to Hamilton Road and the Constitution Trail. This project will provide residents with new access to this main travel corridor.

Additionally, while the Bloomington-Normal mass transit system, Connect Transit, currently has no route through the project area, completing the Hamilton Connection will provide the opportunity for Connect Transit to create new service areas and potentially improve the

efficiency of its bus routes. Creating a safer route that may increase development in the area could lead to future mass transit expansion.

Figure 10: Proposed Constitution Trail Connection

1.3 Project History and Context

Creation of an east-west arterial in south Bloomington was formally adopted as part of Bloomington's transportation planning in 1962 as part of the "Major Street and Highway Plan Bloomington-Normal Urban Area." Engineers and planners correctly predicted southern expansion of the city. That growth was pronounced in the 1980s and 1990s and continued into the new century.

The growth that occurred spanned all economic classes. The south side of Bloomington has an abundance of housing and includes new subdivisions of high-end and mid-priced homes, as well as mobile home parks for low-income residents. Development in the southeast of Bloomington was anchored by the construction of State Farm's south campus. The growth in this area created the impetus to create the arterial road, associated services, and other amenities, including the Prairie Vista Golf Course (opened in 1991), and The Den at Fox Creek Golf Course (opened in 1997). The corridor also takes users to Pepper Ridge School and Park on the southwest side, and an employees' State Farm Park at Hamilton and Main streets.

Hamilton Road and Fox Creek Road were developed into the east-west arterial as funding allowed. Planning, engineering, and construction were a connecting of dots. In some places, two-lane rural road was reconstructed; in others, new, five-lane segments were created. With this grant and the upcoming improvements to the Fox Creek Road Bridge, **the City will have invested nearly $39 million in state Motor Fuel Tax allotment, general revenue, and portions of Federal Aid Urban (FAU) route money allotted through its metropolitan planning organization.** Only two pieces of the planned arterial remain unfinished. These are:

- Fox Creek Bridge: Located on the southwest side of Bloomington, this project will include widening and reconstruction with a project cost of approximately $8 million. The project is fully funded using state and local funding and scheduled for 2021 construction.
- Hamilton Connection: Phase II engineering has begun, and construction could begin in 2021 if the requested $5,425,000 BUILD discretionary grant funding is secured this year.

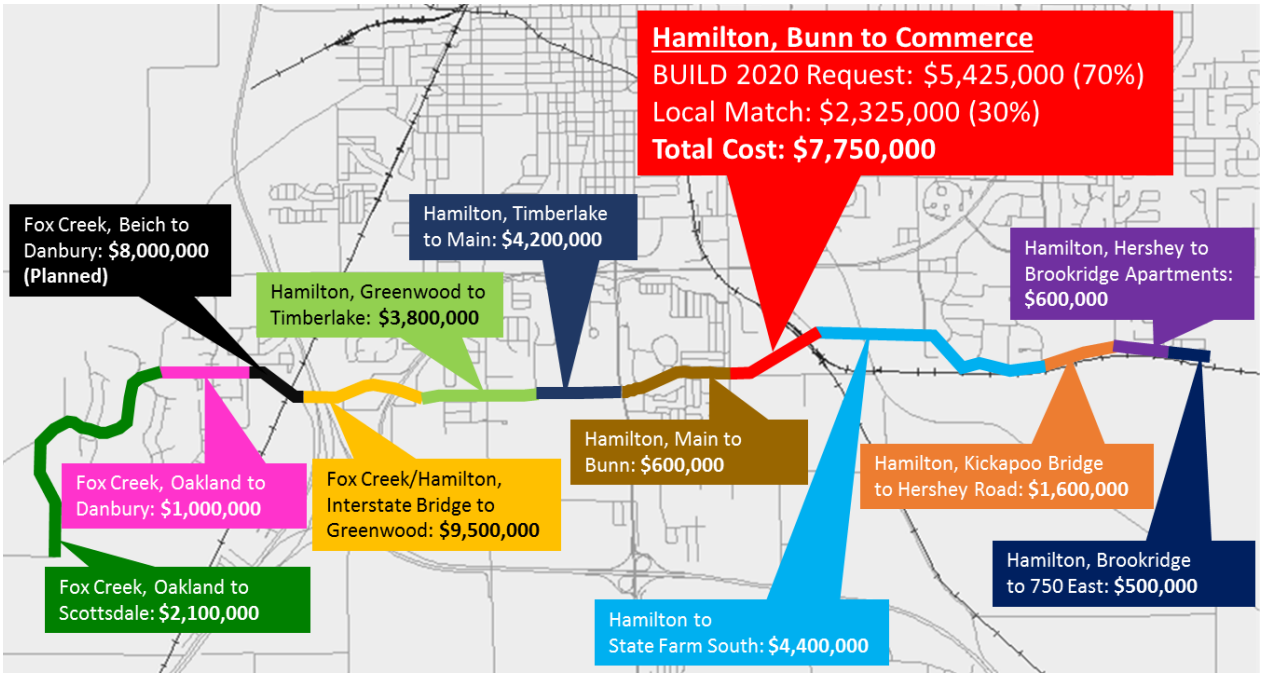


Figure 11: The phases of Hamilton Road and Fox Creek Road

Table 3: Hamilton Road Corridor Expenditures

Locations	Constructed	Project Cost	FAU
Fox Creek, Oakland to Scottsdale	2007	$2,100,000	
Fox Creek, Oakland to Danbury	1998	$1,000,000	
Fox Creek/Hamilton, I-55 bridge to Greenwood	2004	$9,500,000	$3,500,000
Hamilton, Greenwood to Timberlake	2007	$3,800,000	$2,400,000
Hamilton, Timberlake to Main	2010	$4,200,000	$3,100,000
Hamilton, Main to Bunn	1993	$600,000	
Hamilton, State Farm south campus	1990	$4,400,000	
Hamilton, Kickapoo bridge to Hershey	1996	$1,600,000	
Hamilton, Hershey to Brookridge	2003	$600,000	
Hamilton, Brookridge to 750 East	2012	$500,000	
	Subtotal	**$28,300,000**	**$9,000,000**

Remaining Locations		Project Cost	
Hamilton, Bunn to Commerce		$7,750,000	
Fox Creek, Beich to Danbury (Bridge)		$8,000,000	
	Subtotal	**$15,750,000**	

	TOTAL	**$44,050,000**	**$9,000,000**

1.4 How the Project Will Benefit Communities in Rural Areas

Bloomington is defined as rural by the BUILD Discretionary Grant Notice of Funding Opportunity. It is within the Bloomington-Normal Census Urbanized Area, which had a Census 2010 population of 132,600. Bloomington's Census 2010 population was 76,610, and Normal's Census 2010 population was 52,497. The Twin Cities serve as a commercial, governmental, educational, and cultural hub of McLean County and Central Illinois. Residents of numerous nearby smaller communities work at State Farm and other south Bloomington locations and use south Bloomington amenities. Smaller communities in the area include Carlock, Danvers, McLean, Heyworth, Le Roy, Downs, Ellsworth, Towanda, Lexington, and Hudson, among others. For these residents, the Hamilton Connection will provide a safer, more efficient means of travel.

1.5 Statement of Work

Elements of the Hamilton Connection project are summarized in Section 1.1 and described in further detail in the Phase I Project Development Report.

2. Project Location

2.1 Geographical Description

Bloomington is at the crossroads of three interstates, connecting with Indianapolis and the Quad Cities on Interstate 74, Chicago to St. Louis on Interstate 55, and to Madison, Wisconsin, on Interstate 39. The City is also a crossroads for Norfolk Southern Railway and Union Pacific Railroad (including Amtrak in Normal to the north) and features the Central Illinois Regional Airport, with a FedEx hangar and direct passenger flights to Chicago, Atlanta, Dallas/Ft. Worth, and other destinations. Bloomington is home to State Farm Insurance, ranked 36th on the Fortune 500, Country Financial, Illinois Wesleyan University, and a diverse group of businesses and residents. Normal, directly to the north, is home to Illinois State University. Bloomington is located in and is the county seat of McLean County and has a 2010 Census population of 76,610. The project is located within Illinois' 18th Congressional District and adjacent to Illinois' 13th Congressional District. While not located within an Opportunity Zone, the project is approximately 4 miles away from the Low-Income Community Opportunity Zone located in Census Tract 17113000200 in McLean County.

2.2 Project Location Map and Connections to Existing Transportation Infrastructure

The proposed project is located on the south side of Bloomington in Mclean County, Illinois, which is surrounded by the following counties: Woodford, Livingston, Ford, Champaign, Piatt, DeWitt, Logan, and Tazewell.

The following interstates and highways pass through or around Bloomington: Interstate 74, Interstate 55, Business Route 55 (Veterans Parkway), US Route 66, US Route 51, US Route 150, US Route 136, Illinois Route 9, Illinois Route 29, and Illinois Route 122. The proposed project also connects Constitution Trail, a shared-use path, which is for pedestrians and bicyclists.

Figure 12: Project Location Map

2.3 Geospatial Data Describing Project Location

From west to east, the Hamilton Road project stretches from Bunn Street (40.451335, -88.981314; latitude, longitude) to Commerce Parkway (40.454358, -88.972575) to Morrissey Drive/US Route 150 (40.454418, -88.968024). The project closes the Rhodes Lane approach to Morrissey Drive/US Route 150 (40.451488, -88.966778). The project is located in Section 15 and 16 in Township 23 North, Range 2 East of the 3rd Principal Meridian.

2.4 Opportunity Zone Location

The project is not located within an Opportunity Zone, but it is approximately 4 miles away from the Low-Income Community Opportunity Zone located in Census Tract 17113000200.

2.5 Census-Designated Urbanized Area

Bloomington is rural and is within the Bloomington-Normal Census Urbanized Area, which had a 2010 population of 132,600.

3. Grant Funds, Sources, and Uses of all Project Funding

3.1 Costs for the BUILD 2020 Project

The City of Bloomington is the lead applicant for the BUILD 2020 Discretionary Grant and requests $5,425,000, which represents 70 percent of the total project cost of $7,750,000. Local funds committed to the project amount to $2,325,000 or 30 percent of the total project cost.

All infrastructure improvements within this project are within the jurisdiction of the City of Bloomington and will be maintained by the City for the life of the project. The City of Bloomington will also serve as the certified project administrator.

3.2 Sources and Amount of All Funds to be Used for Eligible Project Costs

Table 4: Sources of Funds for Eligible Project Costs

Funding Source	Amount	% of Total Cost
BUILD 2020 Request	$5,425,000	70%
Local Match	$2,325,000	30%
TOTAL COST	**$7,750,000**	**100%**

3.3 Non-Federal Funds to be Used for Eligible Project Costs

On April 13, 2020, the Bloomington, Illinois City Council unanimously approved A Resolution to Commit to Financial Support and Administration of Funds, committing the City to pay the local match. The City has the resources and funding to be able to move forward with this project and keep it on schedule.

3.4 Federal Funds to be Used for Eligible Project Costs and Required Non-Federal Match

The City of Bloomington is requesting $5,425,000 in BUILD 2020 Discretionary Grant funds. The City will use a portion of its local allotment of State Motor Fuel Tax to generate matching funds of $2,325,000. State Motor Fuel Tax allotments carry over year to year, so that a municipality may save for larger projects. The City has allocated $2,325,000 of its state Motor Fuel Tax fund balance for this project.

3.5 How Each Source of Funds Will Be Spent

As part of Phase I engineering, City engineers produced the following estimates of cost (Table 5) with Hanson Professional Services.

Table 5: Non-federal, BUILD, and other federal spending

Category	Non-Federal		BUILD 2020		Other Federal		Total
Roadway	$1,650,000	30%	$3,850,000	70%	$0	0%	$5,500,000
Grade Crossing	$300,000	30%	$700,000	70%	$0	0%	$1,000,000
Traffic Signals	$90,000	30%	$210,000	70%	$0	0%	$300,000
Storm Sewer	$210,000	30%	$490,000	70%	$0	0%	$700,000
Water Main	$75,000	30%	$175,000	70%	$0	0%	$250,000
TOTAL COST	**$2,325,000**	**30%**	**$5,425,000**	**70%**	**$0**	**0%**	**$7,750,000**

A more complete breakdown of costs will be developed as part of Phase II engineering services. Engineering services and land acquisition are being paid outside of the BUILD grant and matching funds.

4. Selection Criteria

4.1 Primary Selection Criteria

4.1.1 Safety

The safety criterion is addressed in Challenge #2 and Solution #2 in Section 1.2 and in Section 6.1.1.3 Reduced Property Damage Only Crashes and Injury/Fatality Crashes.

4.1.2 State of Good Repair

The following section is structured to answer issues, in order, raised on NOFO page 33.

1) The Hamilton Connection project responds to existing deficits in transportation for motorists, bicyclists, and pedestrians. Among issues in the project area are inefficiency and danger in continued use of a rural road, Rhodes Lane, to move urban traffic; underuse of Hamilton Road because of a lack of continuity; and a lack of existing access for bicyclists and pedestrians within the project area. The Hamilton Connection project addresses these problems, as detailed in the Transportation Challenges section of this application (Section 1.2)
2) If left unimproved, these problems will persist.
3) The City portion of the project is properly capitalized, with state Motor Fuel Tax money already banked and designated for the Hamilton Connection. Asset management of Bloomington streets occurs through a two-step process. Field inspectors rate the streets using PASER (Pavement Surface Evaluation and Rating), which was developed by the University of Wisconsin-Madison Transportation Information Center. PASER data is then applied to a software called Decision Optimization Technology run by Infrastructure Solutions, Ontario, Canada. These two steps ensure a consistent, objective street maintenance program.
4) The City of Bloomington maintains its street and sidewalk system primarily through use of a Local Motor Fuel Tax, its allotment of state Motor Fuel Tax, and a quarter of one percent sales tax. Life cycle costs will be reduced by increasing the life of the pavement through asphalt mix selection. Use of stone matrix asphalt will ensure a long-lasting surface.
5) Border security: Does not apply.
6) Arterial and collector streets receive higher priority than neighborhood streets under Bloomington's asset management system.

4.1.3 Economic Competitiveness

The following section is structured to answer issues, in order, raised on NOFO page 34.

1. The improvement of the Hamilton Connection will reduce the project area travel demand model estimated that the Hamilton Connection project will save travelers 9,900 minutes of travel time per day or approximately 60,773 hours per year. In addition, traffic volumes on Veterans Parkway (I-55 Business), Ireland Grove Road, and Empire Street (IL 9) are expected to decrease by 7 to 15 percent following this improvement. The travel demand model is described in Section 1.2, especially Challenge #1 and Solution #1. Section 1.2, especially Challenge #3 and Solution #3, also describes the current problems of access to employers and how this project remedies those issues. The citywide model described in Section 6 shows an overall Network Travel Time reduction of approximately 19,710 hours and 530,710 miles each year.
2. See Section 1.2, especially Challenge #1 and Solution #1, for discussion of improved efficiency.

3. See Section 1.2, especially Challenge #3 and Solution #3 for a discussion of economic development opportunities facilitated by the Hamilton Connection project.

4. The City believes the project will result in job creation and other economic opportunities. The city's Economic Development Department estimates that by constructing this portion of Hamilton Road, over 235 acres will be better positioned for private development. In the Potential Economic Benefits Memo, four sites in the vicinity of the project area are examined where development is likely being depressed because of a lack of mobility along the Hamilton Road corridor. Completing the continuity of Hamilton Road would alleviate some of the associated transportation problems. The memorandum states that development of vacant sites adjacent to the proposed Hamilton Road connection would generate additional property taxes and sales taxes. The memorandum also explains that home prices on the southwest side of Bloomington are depressed due to lack of access to retail opportunities, which the proposed project may help spur to fruition.

5. U.S. competitiveness in global economy: Does not apply.

4.1.4 Environmental Sustainability

This section responds to NOFO page 34 in the order that issues/questions are raised.

4.1.4.1 The Project Will Reduce Energy Use and Air Pollution through Congestion Mitigation Strategies

As discussed in Section 6.1.1, the travel demand model found that the Hamilton Connection project will save about 530,710 miles per year. This translates to reductions in CO_2, NO_X, and PM emissions. Table 6 (right) shows the estimated reduction in emissions calculated in the City's travel demand model. Additional information is provided in the Benefit Cost Analysis computation spreadsheet.

Table 6: Emission Reductions

	Annual Benefit
CO2 Emissions	$230.27 214.40665 Metric Tons
NOx Emissions	$5,020.50 0.54357 Short Tons
PM Emissions	$7,009.51 0.01685 Short Tons

4.1.4.2 The Project Will Minimize Effects on Wetlands.

An environmental study identified slivers of land within the project area as wetlands. The Illinois State Geological Survey conducted a Preliminary Environmental Site Assessment (PESA) report and, as the impact on wetlands will be minimal, IDOT subsequently cleared the project for design. A Wetland Determination Map is included in the Wetland Determination Report.

As stated on page 13 of the Phase 1 Project Development Report "The project would impact a total of 0.04 acre of marsh wetland at Sites 2 and 3. A total of 0.08 acre of wetland credit was deducted from the LaGrange Wetland Bank to mitigate the wetland impact. Wetlands were cleared for letting on February 2, 2019. See Attachment 12."

4.1.4.3 The Project Does Not Involve Brownfield Redevelopment, Etcetera

Item (iii), NOFO Page 34, does not apply.

4.1.5 Quality of Life

The Project Description (Section 1.1) of the application describes how the Hamilton Connection project creates safe, efficient travel to State Farm and other employers in south Bloomington. This applies to Bloomington residents and commuters from nearby smaller communities. Quality of Life also relates to health, and Hamilton Road/Fox Creek Road serves as a hub for health-related activities: (add info about Constitution Trail; would complete 7.2-mile stretch)

- In 2019, the U.S. Department of Veterans Affairs opened a clinic at 207 E. Hamilton Road, which is two blocks west of the project area. The Veterans Affairs clinic provides primary care and mental health services to area military veterans.
- Parks, the Constitution Trail, and two municipal golf courses are located along Hamilton/Fox Creek. Park amenities are mapped in Figure 13.

Figure 13: Map of quality-of-life amenities

4.2 Secondary Selection Criteria

4.2.1 Innovation

Along with state-of-the-art traffic equipment for coordinating intersection traffic signals and railroad gate crossings for emergency vehicles, motorists, pedestrians, and bicyclists, the signals will be built with the ability to be modified for autonomous vehicle communication in the future. For example, controller cabinets will be designed with extra capacity for future equipment as new technologies are developed. In 2018, Bloomington was the first entity in the State of Illinois to construct an intersection's entire traffic signal system using low-voltage equipment. This technology will be utilized on this project for all signalized intersections. With significantly lower power consumption, low-voltage equipment is more environmentally-friendly and has been proven to be safer during installation and maintenance work as well as for first responders in the event of a traffic crash.

In addition, weather monitoring equipment will be included with the traffic signals to gather and report real-time data on pavement and air temperatures, wind speed and direction, and precipitation. This will allow the City to more accurately monitor current, localized weather conditions leading to more efficient snow removal and salt application. It will also report snow conditions that would likely result in signal heads being obscured with wind-blown snow. The City is working diligently to implement future technologies, and will be advertising a Request for Proposals for the implementation of 5G. With State Farm in Bloomington and Rivian, an innovative producer of electric vehicles and a pioneer in autonomous vehicle production, in Normal, the project area and the City in general could become a great area to develop autonomous technologies.

4.2.2 Partnership

In 2011, the City of Bloomington prepared the Southeast Bloomington Railroad Crossing and Transportation Study to review potential roadway alignments, provide recommendation for railroad crossing location and type and to look at the environmental conditions in the area. One of the potential roadway alignments was the Hamilton Road Improvement between Bunn Street and Commerce Parkway. An aspect of this study was key stakeholder interviews with State Farm and Normal-based McLean County Unit District 5. Both entities expressed support for the project. Information on letters of support from area stakeholders is available in Section 5.2.1.5.

Partners on this project are as follows:

Illinois Department of Transportation (IDOT): IDOT is a source of local expertise. The proposed improvements will affect IDOT, as traffic volumes and access on their state-owned routes will be improved. Safety on US 150 (Morrissey Drive) will be improved as well because the closure of the Rhodes Lane intersection, a high crash location, makes it feasible for gates and lights to be added to the US 150 at-grade crossing. IDOT has jurisdiction/review authority on both Morrissey intersections affected by this project.

McLean County Regional Planning Commission: MCRPC serves as the Metropolitan Planning Organization. As such, it hosts two planning committees. Both committees have

membership that includes the Federal Highway Administration, the Federal Transit Administration, IDOT, City of Bloomington, Town of Normal, Central Illinois Regional Airport, and the Connect Transit local bus service. The MPO allocated $9 million in Federal Air Urban funds for various other phases of the Hamilton/Fox Creek corridor, as shown in Table 3.

Norfolk Southern Railway: The railroad crossing will be built based on guidelines and approved by Norfolk Southern Railway. It is anticipated that the agreement will include a new siding in a location that will improve the operations of Norfolk Southern Railway. Also, the agreement is anticipated to include the closing of two existing at-grade railroad crossings.

Illinois Commerce Commission (ICC): The ICC must approve the at-grade crossing and may provide funding for closing two at-grade railroad crossings elsewhere in Bloomington that are tangentially related to construction of a new at-grade crossing in the project area.

4.3 Demonstrated Project Readiness

4.3.1 Environmental Risk

The project has been approved by NEPA as shown in page 1 of the Phase I Project Development Report. A Preliminary Site Assessment (PESA) and other studies have been performed indicating minimal environmental impact. Project planning has included a wetlands study and corresponding plans to address wetlands, as explained above in Section 4.1.4 . The environmental study also included noise testing as documented in a Traffic Noise Technical Report (See Attachment 12 of the Phase I Project Development Report). Nine noise receptors were used to analyze the subject area in build and no-build scenarios. Results of this analysis (Table 7) found that only one receptor approached the Noise Abatement Criteria whereas the other eight were found to have no impact. Further evaluation found that the actual implementation of a noise abatement measure did not meet the feasibility requirements and therefore, none have been implemented in the design.

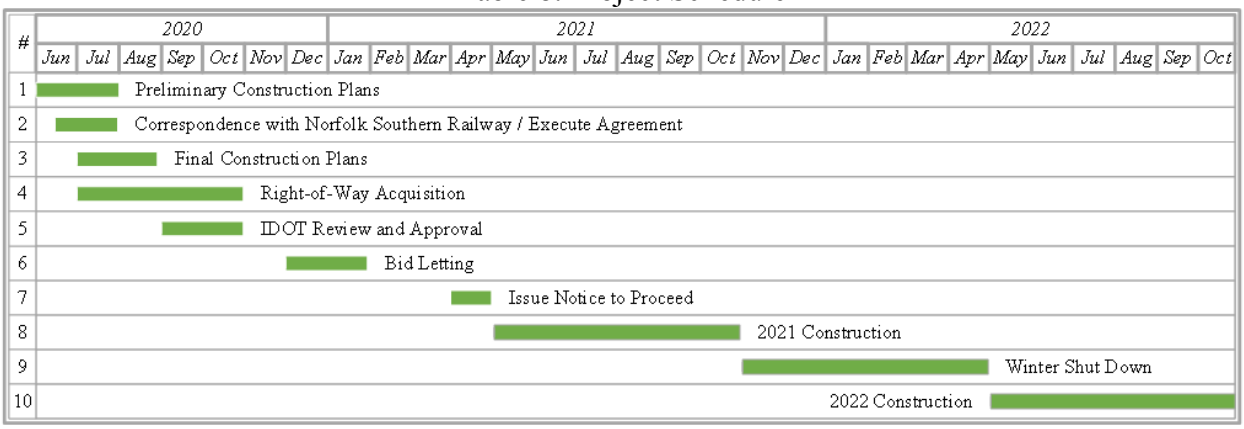
Table 7: Noise Analysis Results Summary

Receptor Number[1]	Type	Represents	NAC[2] dB(A)	2016 Existing Noise Level dB(A)	Predicted Year			Impacted
					2040 Build Noise Level dB(A)	2040 No- Build Noise Level dB(A)	Build Increase over Existing dB(A)	
R1	Residential	32 Houses	67	58	62	60	4	No Impact
R2	Residential	93 Houses	67	56	61	59	5	No Impact
R3	Residential	3 Houses	67	52	57	55	5	No Impact
R4	Residential	1 House	67	63	66	66	3	Yes-NAC
R5	Residential	4 Houses	67	63	65	66	2	No Impact
R6	Commercial	1 Office	72	55	51	58	-4	No Impact
R7	Residential	1 House	67	55	56	57	1	No Impact
R8	Commercial	1 Office	72	65	57	68	-8	No Impact
R9	Commercial	Local Farm Stand	72	64	67	67	3	No Impact

[1] See attached Figures 2A and 2B for receptor locations [2] Noise Abatement Criteria

4.3.2 Project Schedule

Table 8: Project Schedule



4.3.3 Technical Capacity

The City of Bloomington will administer the project. The City's Department of Public Works, Engineering Division, has extensive experience in managing large construction projects that include significant federal dollars. Recent examples of the City's related experience are in Table 9.

Table 9: City of Bloomington Experience Managing Federally Funded Projects

Project	Program Year	Total Cost	Federal Cost
Hamilton Road – Cabintown to Greenwood	2003	$9,541,000	$3,529,200
Fell Avenue Bridge Replacement	2005	$1,438,000	$501,000
Main Street Beautification – Front to Washington	2006	$205,000	$161,000
Ireland Grove Road Resurfacing – Veterans to Bridge over Little Kickapoo Creek	2009	$570,000	$470,000
College Avenue & Hershey Road Traffic Signals	2009	$173,000	$150,000
Hamilton Road – Greenwood to Timberlake	2010	$3,757,000	$2,386,000
Hamilton Road – Timberlake to Main	2013	$4,189,000	$3,019,000
Benjamin School Trail Safe Routes to School (SRTS)	2014	$250,506	$160,000
CDBG Elm Street sewers	2019	$175,000	$175,000
CDBG McLean Street sidewalks	2019	$80,000	$80,000
CDBG West Corridor Sidewalks	2020	$80,000	$80,000
Sheridan Safe Routes to School	2020	$200,000	$200,000

Complementing the experience of city personnel, Hanson Professional Services was hired through Quality Based Selection as the lead design firm. Hanson Professional Services has decades of experience on arterial roadway projects and also specializes in rail projects.

The Illinois Department of Transportation will administer the funds and assist City personnel with questions.

4.3.4 Financial Capacity

The City of Bloomington banks its state Motor Fuel Tax allotment so that it may fund major projects on a pay-as-you-go basis. At the close of FY20, the City had a state Motor Fuel Tax fund balance of $11,076,366. It projects to have a fund balance of $5,423,134 at the end of FY21 – after spending $2,325,000 on the BUILD fund match and funding other projects. It will fund final design, outside the grant, by matching Federal Surface Transportation (STU) with state Motor Fuel Tax funds. The FY21 budget also includes funds for the Norfolk Southern Railway siding relocation – also outside the grant. The Bloomington City Council, by resolution, committed to matching BUILD 2020 funding. The resolution is an online attachment located here. The City of Bloomington does not foresee any issues with constructing the project arising from COVID-19. The City has the resources to fund and administer the project and is prepared to complete the project with the schedule included in Section 5.1. Bloomington is currently moving forward with Phase II engineering, and construction would begin in 2021 if BUILD 2020 funding is secured.

5. Environmental Risk Review

5.1 Project Schedule

The City of Bloomington has selected Hanson Professional Services as the consultant engineer. They are currently in the process of preparing construction documents as well as beginning the process of land acquisition. The land acquisition process is the critical path item and is expected to be completed by November 2020. The letting is currently scheduled for the beginning of 2021 with a planned start of construction May 2021 and completion by October 2022. See Table 8 in Section 4.3.2 Project Schedule.

5.2 Required Approvals

5.2.1 Environmental Permits and Reviews

5.2.1.1 NEPA Status

The Federal Highway Administration (FHWA) approved the project as a Categorical Exclusion on August 20, 2019, included with the Phase I Project Development Report.

5.2.1.2 Reviews, Approvals, and Permits by Other Agencies

The City of Bloomington and Norfolk Southern Railway need to conclude negotiations on relocation of railroad sidings and complete an agreement for the new crossing. The Illinois Commerce Commission must approve the at-grade crossing. Additional details on these negotiations is available in Section 5.3 Assessment of Project Risks and Mitigation Strategies.

5.2.1.3 Environmental Studies or Other Documents

In March 2019, Hanson Professional Services produced a Preliminary Environmental Site Assessment (PESA) for IDOT and the City of Bloomington.

The Illinois Natural History Survey and Illinois Department of Transportation produced a Wetlands Determination Report in September 2018.

Hanson Professional Services produced a Traffic Noise Report on August 16, 2019, with a finding that most likely, no noise barriers or other abatement measures will be required, but that the issue would be reexamined in final design. A summary of the Traffic Noise Report is provided in Section 4.3.1 Environmental Risk. The report is contained in the Phase 1 Project Development Report.

A September 17, 2018, letter from the U.S. Department of the Interior, Fish and Wildlife Service, which includes a species list, confirmed that the project area contains no known endangered or threatened species.

5.2.1.4 Description of Discussions with Illinois Department of Transportation

Environment-related studies and actions are guided by discussions and electronic mail among the City, Hanson Professional Services, IDOT District 5 (Paris), the IDOT central office (Springfield), and staff from FHWA.

5.2.1.5 Description of Public Engagement About the Project

The City has gathered supportive comments from businesses and local bicycle clubs toward the project. It hosted two public meetings. A meeting was held Sept. 22, 2016, at the Prairie Vista Golf Course clubhouse. The meeting was advertised in the local newspaper, The Pantagraph. Sixteen people signed in; none gave negative comments. Another meeting was held March 14, 2019, at the same location. In addition to newspaper advertisement, it was promoted by the City on an electronic sign board on Hamilton Road so as to better alert affected persons. Again, no public opposition was expressed.

Many governmental entities, businesses, organizations, and elected officials provided letters of support for this project for the City's 2019 BUILD grant submission. ***The City is confident that their support has not changed.*** While the COVID-19 pandemic has severely limited the ability of the City to obtain updated letters of support for the 2020 BUILD grant submission, especially as businesses and organizations cannot work as quickly as usual during the pandemic, the City is working diligently to obtain updated letters to show continued support. While several businesses and the Illinois Department of Transportation provided updated letters, the City will submit additional, updated letters as they are received. If letters are not received, the City will rely on previously-submitted letters of support. All of these letters of support will be sent directly to USDOT Secretary Elaine L. Chao via e-mail. Electronic copies of the letters are also available on the project website (www.BUILDingBloomington.com).

5.2.2 State and Local Approvals

State environmental improvements are discussed above. Also, see Description of Public Engagement About the Project and Partnerships for information about broad public support for the project. See Section 5.2.1.3 Environmental Studies or Other Documents.

5.2.3 Federal Transportation Requirements Affecting State and Local Planning

Not applicable.

5.3 Assessment of Project Risks and Mitigation Strategies

The City has been to negotiating with Norfolk Southern Railway to build a new at-grade crossing for the Hamilton Connection. Negotiations with Norfolk Southern Railway for this crossing have started and stopped over the life of the project. The agreement for the crossing has been the primary barrier for the project completion.

Norfolk Southern Railway and the City have made tremendous strides recently compared to past negotiations. In 2016, Norfolk Southern Railway provided a letter stating they were willing to consider an at-grade crossing of Hamilton Road. The City will be responsible for relocating the existing sidings and closing two additional crossings as part of a separate project. The Illinois Commerce Commission has facilitated with the goal of obtaining an agreement for the proposed at-grade crossing. In recent months, Norfolk Southern Railway and the City have agreed on a location for the railroad siding relocation that is more beneficial to Norfolk Southern Railway operations. Norfolk Southern Railway staff is preparing a draft agreement and is expected to respond presently. Norfolk Southern Railway has presented a project schedule which would result in an executed railroad agreement in September 2020. Additionally, Norfolk Southern Railway staff has started to provide feedback on the details of the crossing, making progress on the design.

6. Benefit Cost Analysis

Hanson Professional Services performed a Benefit Cost Analysis (BCA) for the project, which is attached and included in the online attachments available at www.BUILDingBloomington.com. The BCA narrative is available here, and the BCA computations are available here. The BCA utilizes the Benefit-Cost Analysis Guidance for Discretionary Grant Programs document issued by the Office of the Secretary of the USDOT in January 2020. The spreadsheet provides present value estimates of the project's benefits and costs relative to a no-build baseline. The consultant applied a real discount rate of 7 percent per year to the project's streams of benefits and costs. All costs use a 1.074 percent per year GDP deflator using Appendix B: Sample Calculations[1]. **The Hamilton Road Extension Project's benefit-cost ratio is projected to be 1.63, showing that the benefits of the project outweigh the costs.**

The City of Bloomington uses a citywide travel demand model (TDM), which was built by Hanson Professional Services using Cube. It is a standard, four-step travel demand model with mode choice removed from the computational process. Mode choice was removed, because so few trips within the region are completed using modes other than vehicles. The citywide model was built with 2010 socioeconomic data for land use, population, income, employment type, and the most current version of the road network. Attributes for the roadway network include number of lanes, posted speed limit, functional classification, and intersection controls. GIS files illustrating the existing (2010) socioeconomic conditions and modeled existing road network as well as a GIS file with the proposed road network, which includes the Hamilton Road, Bunn Street to Commerce Parkway connection, are available online.

The BCA makes a comparison between the existing condition and proposed condition to show the savings The Rhodes Lane condition in the Delay table is used as the existing condition, because Rhodes Lane is currently open. The Hamilton Road condition the proposed condition, because Hamilton Road is connected and Rhodes Lane is closed with the proposed project.

Vehicle Miles Traveled (VMT) and Vehicle Hours Traveled (VHT) values used for the benefit cost analysis are calculated using a combination of the road (link) length from the road network file and the modeled Average Daily Traffic (ADT) volumes and congested travel speeds for each link as calculated by the Cube model. A standard script within Cube is used to multiply these factors over the city-wide network for a 24-hour period. The multiplication renders the VHT and VMT for the scenarios provided in the benefit-cost analysis. Using the TDM and the variables below, Hanson Professional Services found a **total benefit of $13,739,288** through 2052, as shown in Table 10.

6.1 Primary Economic Benefits

6.1.1 Savings for Existing Users and New Users

6.1.1.1 Savings in Travel Time Costs

The BCA uses the recommended monetized values from Table A-3: Value of Travel Time for In-Vehicle Travel – All Purposes Category[1], which is an hourly value of $16.60 in 2018 dollars.

[1]Office of the Secretary of the United States Department of Transportation. 2020. "Benefit-Cost Analysis Guidance for Discretionary Grant Programs." https://www.transportation.gov/sites/dot.gov/files/2020-01/benefit-cost-analysis-guidance-2020_0.pdf

Using the TDM referenced above, the consultant calculated total vehicle hours for the project and the no-build scenario. The TDM showed Total Vehicle Hours of 42,613 for the no-build scenario and a value of 42,559 if the project is built. The difference between these numbers shows that the project provides for an additional 54 hours per day, or 19,710 hours per year, in travel efficiency when compared to the no-build scenario. This amounts to an annual project benefit of $351,387.11 in 2021 dollars.

6.1.1.2 Savings in Vehicle Operating Costs

Using Table-A-5: Vehicle Operating recommended monetized values for the Light Duty Vehicles category[3], which has a recommended value per mile of $0.41 in 2018 dollars, the BCA found that the project provides a 4,454 mile-per-day benefit by using the Total Vehicle Miles data calculated for the TDM and subtracting the build scenario from the no-build scenario. The calculations showed that Total Vehicle Miles would be 1,633,389 for the no-build scenario and 1,631,935 if the project is built. The difference between the scenarios amounts to a 530,710 mile-per-year benefit with annual savings of $233,685.76.

6.1.1.3 Reduced Property Damage Only Crashes and Injury/Fatality Crashes

To calculate the savings in in safety costs for both existing users of the improved facility and new users who may be attracted to it as a result of the project, the consultant calculated the reduction in Property Damage Only (PDO) crashes and Injury/Fatality Crashes by completing an HSM-level (Highway Safety Manual) crash analysis with crash data from the Illinois Department of Transportation and using Crash Modification Factors (CMFs) from the HSM and the CMF Clearinghouse[2]. The crash data is from 2009 to 2014, but, since the road network has not changed, the crash reductions would still apply, since it uses CMFs. In addition, traffic volumes for the proposed Morrissey Crossing and Hamilton Crossing were pulled from the 2035 TDM and reduced backward at 3 percent to the 10-year average daily traffic required for the Illinois Department of Transportation Bureau of Local Roads Expected Crash Frequency Equation. The PDO crash data shows a reduction of 2.53 crashes per year. Using Table A-2: Property Damage Only (PDO) Crashes[3] that shows a recommended monetized value of $4,400 per vehicle in 2018 dollars, the BCA shows an annual savings of $11,955.41. The BCA uses the Injury Crash monetized value of $250,600 in 2018 dollars from Table A-1[3], multiplied by a reduction in 1.15 crashes per year, for a savings of $308,430.13, not including inflation and discount rate.

6.1.1.4 Reduced Damage from Carbon Dioxide Emissions

The BCA calculated reduced damage from Carbon Dioxide emissions by first calculating the amount of carbon dioxide that would be emitted in the no-build scenario and the build scenario using Total Vehicle Miles from the TDM discussed above. According to the United States Environmental Protection agency, 404 grams of CO_2 are emitted by the average passenger vehicle per mile.[4] Using the difference of 530,710 miles per year, and making the conversion to

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[2] Crash Modifications Factors Clearinghouse. 2020. http://www.cmfclearinghouse.org/

[3] Office of the Secretary of the United States Department of Transportation. 2020. "Benefit-Cost Analysis Guidance for Discretionary Grant Programs." https://www.transportation.gov/sites/dot.gov/files/2020-01/benefit-cost-analysis-guidance-2020_0.pdf

[4] United States Environmental Protection Agency. 2018. "Greenhouse Gas Emissions from a Typical Passenger Vehicle." https://www.epa.gov/greenvehicles/greenhouse-gas-emissions-typical-passenger-vehicle.

metric tons, combined with the recommended monetized value from Table A-7[5], the BCA shows an annual project benefit of $230.27 per year.

6.1.1.5 Reduced Damage from Nitrogen Oxides Emissions

To calculate the reduced damage from Nitrogen Oxides, the BCA uses the calculated grams per mile of Nitrogen Oxides that would be emitted per mile (approximately 0.929 for Average Emissions Per Vehicle, Gasoline and Diesel Fleet for 2018), according to the US Department of Transportation's Bureau of Transportation Statistics.[5] Using the 530,710-mile difference between the no-build scenario and the build scenario, and making the conversion to short tons, the calculation uses the recommended monetized value from Table A-6[5] and shows an annual project benefit of $5,020.50.

6.1.1.6 Reduced Damage from Particulate Matter Emissions

Similarly, the BCA uses the average of approximately 0.029 grams per mile of Particulate Matter emissions per vehicle (Gasoline and Diesel Fleet for 2018) according to the Bureau of Transportation Statistics.[5] Making the conversion to short tons and multiplying it by the 530,710-mile difference between the no-build scenario and the build scenario, and using the recommended monetized value from Table A-6[5], the calculation shows an annual project benefit of $7,009.51.

6.1.2 Costs of Developing, Constructing, Operating, and Maintaining the Project

As part of Phase I engineering, City engineers produced the following estimates of cost (Table 5) with Hanson Professional Services.

Table 10: Costs of Constructing the Project

Category	Cost
Traffic Signals	$300,000
Storm Sewer	$700,000
Water Main	$250,000
Roadway	$5,500,000
Grade Crossing	$1,000,000
Total	**$7,750,000**

The schedule for costs and costs of maintaining the project are shown in Table 11 and included in the attached BCA. Hanson Professional Services calculated maintenance costs by using average unit costs for Class B patches, 2.5-inch surface removal, 2.5-inch HMA overlay, and assuming no crack filling, five percent patching done with mill and fill, with mill and fill every 12 years, and approximately 4,528 tons for an HMA overlay. Using the GDP Deflator and the 7% discounted rate, the **total maintenance costs through 2052 are $664,575**.

[5] United States Department of Transportation Bureau of Transportation Statistics. 2018. "National Transportation Statistics 2018 4th Quarter" https://www.bts.gov/sites/bts.dot.gov/files/docs/browse-statistical-products-and-data/national-transportation-statistics/223001/ntsentire2018q4.pdf

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
		2021 $		1.8 % Inflation		7% Discounted	
Year	Calendar Year	Benefits	Costs	Benefits	Costs	Benefits	Costs
0	2021	$ -	$ 4,000,000	$ -	$ 4,000,000	$ -	$ 4,000,000
1	2022	$ -	$ 3,750,000	$ -	$ 3,750,000	$ -	$ 3,750,000
2	2023	$ 918,911	$ -	$ 935,452	$ -	$ 874,254	$ -
4	2024	$ 918,911	$ -	$ 969,431	$ -	$ 791,344	$ -
5	2025	$ 918,911	$ -	$ 986,881	$ -	$ 752,887	$ -
6	2026	$ 918,911	$ -	$ 1,004,644	$ -	$ 716,298	$ -
7	2027	$ 918,911	$ -	$ 1,022,728	$ -	$ 681,487	$ -
8	2028	$ 918,911	$ -	$ 1,041,137	$ -	$ 648,368	$ -
9	2029	$ 918,911	$ -	$ 1,059,878	$ -	$ 616,858	$ -
10	2030	$ 918,911	$ -	$ 1,078,955	$ -	$ 586,880	$ -
11	2031	$ 918,911	$ -	$ 1,098,377	$ -	$ 558,359	$ -
12	2032	$ 918,911	$ -	$ 1,118,147	$ -	$ 531,224	$ -
13	2033	$ 918,911	$ -	$ 1,138,274	$ -	$ 505,407	$ -
14	2034	$ 918,911	$ 1,135,329	$ 1,158,763	$ 1,175,718	$ 480,845	$ 455,964
15	2035	$ 918,911	$ -	$ 1,179,621	$ -	$ 457,477	$ -
16	2036	$ 918,911	$ -	$ 1,200,854	$ -	$ 435,245	$ -
17	2037	$ 918,911	$ -	$ 1,222,469	$ -	$ 414,093	$ -
18	2038	$ 918,911	$ -	$ 1,244,474	$ -	$ 393,969	$ -
19	2039	$ 918,911	$ -	$ 1,266,874	$ -	$ 374,822	$ -
20	2040	$ 918,911	$ -	$ 1,289,678	$ -	$ 356,607	$ -
21	2041	$ 918,911	$ -	$ 1,312,892	$ -	$ 339,276	$ -
22	2042	$ 918,911	$ -	$ 1,336,524	$ -	$ 322,788	$ -
23	2043	$ 918,911	$ -	$ 1,360,582	$ -	$ 307,101	$ -
24	2044	$ 918,911	$ -	$ 1,385,072	$ -	$ 292,177	$ -
25	2045	$ 918,911	$ -	$ 1,410,003	$ -	$ 277,977	$ -
26	2046	$ 918,911	$ 1,135,329	$ 1,435,384	$ 1,211,478	$ 264,468	$ 208,611
27	2047	$ 918,911	$ -	$ 1,461,220	$ -	$ 251,616	$ -
28	2048	$ 918,911	$ -	$ 1,487,522	$ -	$ 239,388	$ -
29	2049	$ 918,911	$ -	$ 1,514,298	$ -	$ 227,754	$ -
30	2050	$ 918,911	$ -	$ 1,541,555	$ -	$ 216,685	$ -
31	2051	$ 918,911	$ -	$ 1,569,303	$ -	$ 206,155	$ -
32	2052	$ 918,911	$ -	$ 1,597,551	$ -	$ 196,136	$ -
Residual Life		$ 1,974,024		$ 3,431,891		$ 421,344	
Total						**$ 13,739,288**	**$ 8,414,575**
Benefit Cost Ratio						**1.63**	

(C) = Annual Benefit

(D) = Construction Costs in 2021 $

(E) = (C) x $1.018^{(A-1)}$, total annual benefit with a 1.8% annual inflation

(D) = Cost Already Include Inflation Contigency

(G) = (E)/$(1.07^{(A-1)})$

(H) = (F)/$(1.07^{(A-1)})$

Benefit Cost Ratio = Total (G)/Total (H)

Useful Service Life = 30 years for initial Construction

Useful Service Life = 12 years for maintenance

Table 11: Project Benefits, Costs of Maintaining the Project, and Schedule for Benefits and Costs

7. Effects of COVID-19

As a result of the COVID-19 Pandemic, the BUILD Discretionary Grants website requests that applicants identify any areas in the application narrative that may be affected by the ongoing COVID-19 situation for the Department's consideration in the project's evaluation.

The City of Bloomington does not foresee any issues with constructing the project arising from COVID-19. The City has the resources to fund and administer the project and is prepared to complete the project with the schedule included in Section 5.1. Bloomington is currently moving forward with Phase II engineering, and construction would begin in 2021 if BUILD 2020 funding is secured.

Many governmental entities, businesses, organizations, and elected officials provided letters of support for this project for the City's 2019 BUILD grant submission. ***The City is confident that their support has not changed.*** While the COVID-19 pandemic has severely limited the ability of the City to obtain updated letters of support for the 2020 BUILD grant submission, especially as businesses and organizations cannot work as quickly as usual during the pandemic, the City is working diligently to obtain updated letters to show continued support. More information about the letters of support is included in Section 5.2.1.5.