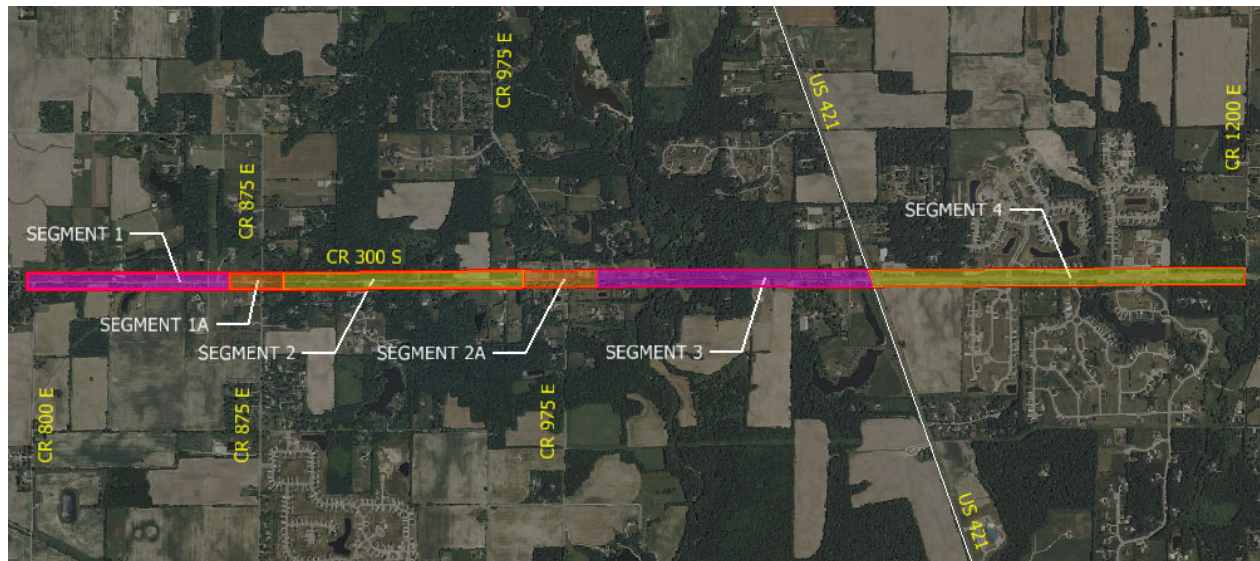




**CR 300 SOUTH CORRIDOR STUDY
CR 800 EAST TO CR 1200 EAST (EAST COUNTY LINE)**

**LOCATED IN:
BOONE COUNTY, INDIANA
AND THE TOWN OF ZIONSVILLE, INDIANA**

June 30, 2021



PREPARED FOR:

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Indianapolis MPO

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ENGINEERING ASSESSMENT REPORT**BLN PROJECT NUMBER: 190048****PROJECT LOCATION:****CR 300 S from S 800 E to N 1200 E in Sections 13,14,15, and 16, T-18-N, R-2-E of Union Township and Sections 21,22,23 and 24, T-18-N, R-2-E, Eagle Township, Boone County, Indiana****BEGIN: LATITUDE: N 39° 59' 52" LONGITUDE: W 86° 19' 04"****END: LATITUDE: N 39° 59' 55" LONGITUDE: W 86° 14' 84"****1. INTRODUCTION AND ACKNOWLEDGEMENTS**

This report was prepared in cooperation with the following agencies:

- The State of Indiana and the Indiana Department of Transportation
- The Federal Highway Administration
- The Indianapolis Metropolitan Planning Organization (MPO)
- Boone County
- The Town of Zionsville.

The report was prepared with partial funding received through a planning grant from the Indianapolis MPO. The balance of the funding to prepare this report was provided jointly by Boone County and the Town of Zionsville.

2. PURPOSE OF REPORT

There are two purposes of this report. The first is to document the engineering assessment phase of the project development and define the intended scope of improvements. This report will present project specific information regarding the survey, design, environmental matters, potential impacts, project alternatives, and estimated costs. The preferred alternative identified in this document is considered pre-decisional.

The secondary purpose of this report is to establish a preliminary planning document which the County and Town can use as a tool to manage and coordinate growth and traffic planning along the corridor. Future development along the corridor can be coordinated with the contents of this report. This document can serve as a supplemental resource to each agency's thoroughfare plan and other related official planning documents.

3. PROJECT LOCATION

The project is the proposed expansion and reconstruction of CR 300 S in Boone County, Indiana. The project begins just east of CR 800 E and extends east to CR 1200 E (East County Line) along CR 300 S. The project is located in Sections 13,14,15 and 16, Township 18 North, Range 2 East in Union Township and sections 21, 22, 23, and 24, T-18-N, R-2-E in Eagle Township Boone County, Indiana. Maps of the project location and other significant features are provided in Appendix A. Photos of the project corridor at key locations are provided in Appendix B of this report. The project is located on a Section Line and political Township boundary.

4. PROJECT PURPOSE AND NEED

The purpose of this project is to prepare a corridor study with a conceptual design for Boone County and the Town of Zionsville for the expansion and reconstruction of CR 300 S from eastern limits of east of CR 800 S to the Boone County/Hamilton County Line in order to accommodate traffic resulting from current and future development of the adjacent lands. The project also significant due to its continuation into Hamilton County as 146th Street, which is presently in its final stage of reconstruction and expansion just east of the County Line.

The need for this project is to provide a planning tool which initiates the process of easing capacity concerns as the area grows and travel demand on existing facilities increases.

5. EXISTING FACILITIES

Road History

Per the Functional Classification Map located on the Indiana Department of Transportation's website, the corridor is classified as a "Other Principal Arterial" in the Roadway Interactive Viewer. This project is in both rural and suburban areas and has relatively level terrain. The roadway is "Urban" east of US 421 and "Rural" west of US 421. The posted speed limit along the CR 300 S is 40 mph. The Existing Characteristics of the roadway are shown in Table 1 below.

Table 1: CR 300 S Roadway Characteristics	
Functional Classification	Other Principal Arterial
No. of Effective Lanes	2
Lane Width	± 10' West of US 421 ± 12' East of US 421
Shoulder Width	± 2'
Roadside Drainage	Predominantly Open, Poorly Graded, Ditches
Posted Speed Limit (mph)	40
National Highway System	No

The Functional Classification for CR 300 South was changed in October of 2019 to be more consistent between jurisdictions. The Boone County Thoroughfare Plan places special significance on CR 300 S, which has its own Corridor Mini Plan and addresses the number of lanes, cross section, and right-of-way required for future improvements. The Town of Zionsville also has special requirements for CR 300 S in its Thoroughfare Plan. Further information on each agency's Thoroughfare Plan is in the public presentation provided in Appendix G. The elements of design discussed in this report are based on information contained in each Thoroughfare Plan and those contained in the Indiana Department of Transportation's Design Manual (IDM). CR 300 S is designated as an "Arterial" in the Thoroughfare Plan for each agency. The cross sections used for

the preliminary layout were developed using the elements in the Boone County Thoroughfare Plan and are shown in Appendix E.

Drainage

The current corridor is drained by an open ditch system. The project was designed and estimated using an urban cross section with curb and gutter and inlets which drain to occasional open ditches. The design is preliminary and is subject to survey and final design. Roadway drainage along CR 300 S from S 800 E utilizes roadside ditches which is conveyed east towards an unnamed tributary to Jackson Run. From US 421 to the east county line, it is conveyed north towards unnamed tributaries to and directly to Eagle Creek. The section west of US 421 drains directly to Eagle Creek

There are four large culverts/small structures located along the CR 300 S project corridor. The structures within the project limits are identified by their Boone County Structure Numbers in Table 2 below. Project stationing and sizes for each culvert and bridge affected by the project is included in the applicable tables below. Photos of all small structures and bridges are provided in Appendix B.

Two of the crossings are east of US 421 and two are west of US 421. One of the culverts west of US 421 is located at CR 300 S between S 800 E to CR 875 E serving a tributary to Jackson Run. The second crossing is a pair of twin elliptical CMP pipes located at immediately west of US 421. The third small structure is under CR 300 S near Stone Creek Drive. The fourth is located east of Union Elementary School under CR 300 S and is a 13' x 6' wide box. The structures east of US 421 receive surface runoff from the properties along and north of CR 300 S. This water flows from the south through the culvert and ultimately to Little Eagle Creek. Please refer to Section 11 and Appendix A of this report for National Wetlands Inventory information in the project area.

Preliminary proposed culvert sizes were determined using information from USGS StreamStats and HY-8.

Structure Number	Project Station	Existing Size	Proposed Size
UN015	127+75	13.4' x 4.5' Box	14' x 5'
UN007	225+50	2 = 3' x 6' Elliptical CMP	14' x 5'
UN027	299+50	12' x 5' Box	12' x 5'
UN028	316+00	13' x 6' Box	13' x 6'

For simplicity, box culverts were assumed for estimating purposes. Final sizes will need to be verified once a survey is completed and design is initiated. All proposed culverts will be subject to the appropriate environmental standards and permitting for structure replacement. The final structure type could vary based on permitting and local agency requirements. It is expected that such changes will be covered by the contingency in the construction cost estimates provided for the project. It should be anticipated that all small structures and bridges in the project corridor will require permits from IDEM, IDNR, and local agencies. Estimates for culverts and small structures are included in the individual segment of the project in which the structure is located.

Bridges

There are three bridges along the CR 300 S corridor within the project limits. They are as follows:

Boone Co. Bridge Number	Project Station	Stream
06-00192	125+50	Jackson Run
06-00401	174+50	Jackson Run
06-00189	222+75	Eagle Creek

Bridge 06-00192 is located at CR 300 S approximately 550 feet east of CR 800 E. The information provided from the Boone County inventory indicates that the bridge has a length 140 feet and width of 72 feet over Jackson Run. The second is located at CR 300 S and approximately 2,400 feet east of CR 875 E. The information provided from the Boone County inventory indicates that bridge 160 feet long and 72 feet wide over Jackson Run. The third is located at CR 300 S approximately 1,800 feet east of 975 E. The information provided from the Boone County inventory indicates that bridge is 245 feet long with a width of 72 feet over Big Eagle Creek.

The costs for bridge improvements associated with the project were prepared and are provided separately from the roadway construction costs. Design and other non-related construction costs are also compiled separately for each bridge so funding and projects may potentially be pursued as individual projects. Construction estimates are discussed in Section 10 of this report.

Land Use Associated with Design Criteria

CR 300 S is outside the Urban Area Boundary (UAB) of the Indianapolis MPO between CR 800 East and US 421. West of US 421, the UAB is approximately 0.5 mile to the south of CR 300 S. From US 421 to CR 1200 East, the UAB extends north to the south side of CR 300 S. The corridor consists of primarily residential development from US 421 to N 1200 E and low-density subdivisions and farmland from US 421 to CR 800 E. The intersection of US 421 and CR 300 S is signalized. The intersections of CR 300S and 975 E and CR 300 S and 875 E are four-way stops.

Based on Section 40-1.02 "Urban Design Subcategories by Type of area" of the Indiana Design Manual (IDM), the appropriate subcategory for this corridor, by definition, is "Intermediate". The area of the project adjacent to the project corridor is neither Suburban or Built Up by definition. Therefore, the design criteria from the "Intermediate" column of the design table should be used for the development of the project.

Cemetery

The Hutton Cemetery located on the northwest corner of CR 300 South and 975 East/Pleasantview Road is a significant feature that has a direct impact on the future planning and design of the corridor. After investigating the site and other available information regarding the cemetery, it is recommended that the alignment of the route be shifted south to hold the existing edge of pavement for CR 300 S on the south side and 975 E to prevent disturbance of the cemetery. Measurements taken in the field show that the nearest headstone the in cemetery is seven feet from the existing edge of pavement. All project alternatives therefore show an offset alignment in Phase 2 to avoid disturbance to and to limit the need for permanent right-of-way from the cemetery. Intersection Alternatives 2A and 2B are offset to avoid impacts to grade and the location of gravesites.

6. DESIGN CRITERIA

The project consists of the proposed expansion and reconstruction of CR 300 S from S 800 E to N 1200 E. The project corridor was divided into 6 segments. Segment 1 consists of four travel lanes for 0.75 miles from CR 800 E to CR 875 E. Segment 1A consists of intersection improvements at 875 E. Segment 2 consists of four travel lanes for 1.0 mile from CR 875 E to CR 975 E. Segment 2A consists of intersection improvements at CR 975 E. Segment 3 consists of four travel lanes for 1.00 mile from CR 975 E to US 421 (Michigan Road). Segment 4 consists of four travel lanes for 1.25 miles from US 421 to CR 1200 E. Maps and plans of project segments are provided in Appendix E. Each segment has a 16-foot wide median with a multi-use path with curb and gutter per the Boone County Thoroughfare Plan.

Access restrictions along CR 300 S were discussed with Boone County and the Town of Zionsville. Limited access is shown in the preliminary plans for Sections 1, 2, and 3 of the project as part of this report to improve safety and LOS along the corridor. However, there is presently no ordinance or access management restriction guidance in the Boone County Thoroughfare Plan. Section 4 does not have extensive limitation of proposed access points because it was determined with Town Staff that the design of Section 4 would accommodate existing access, except where a Traffic Impact Study for a change of used determined limited access was needed to preserve LOS. Access management and restriction to access are often, beneficial for moving traffic along arterials. It is recommended the Town and County consider such restrictions. The County and Town should consider an official policy or an enabling ordinance or in the Boone County Thoroughfare Plan or applicable regulatory ordinances promulgated by local planning agencies. Such ordinances and policies can be amendments to existing ordinances and planning documents, such as the Thoroughfare Plan. Access restrictions may also be considered or pursued during the acquisition of right-of-way. It is strongly recommended that such consideration be given to any future projects or developments along the corridor.

The minimum design standards used from the Mini Plan for the Corridor in the Boone County Thoroughfare Plan and guidance from officials from Boone County and the Town of Zionsville are as follows:

- 4 – 12-foot travel lanes
- 16-foot median or center turn lane
- Concrete curb and gutter
- 12-foot multi-use path on each side of roadway
- Tree lawn buffer for landscaping

Design criteria for the project was determined from Chapter 53 of Indiana Department of Transportation's Design Manual (IDM). As the Functional Classification for the corridor is "Other Principal Arterial" and project is in an Intermediate Area, the design criteria from Figure 53-6, "Geometric Design Criteria for Urban Arterial, 4 or More Lanes" was determined to be the applicable design criteria. Table 53-6 is hereby incorporated by reference. The basic right-of-way dimensions, number of travel lanes; cross sections, multi-use paths, and other such features are outlined in the approved Mini Corridor Plan from approved in the Boone County Thoroughfare Plan and guidelines established in the Town of Zionsville's Thoroughfare Plan.

7. TRAFFIC DATA

Traffic data was obtained from the Indianapolis MPO for this report. Traffic growth is anticipated in this area due to development to the west, at the intersection of US 421, and the expansion of 146th Street west of CR 1200 E. An annual growth rate of 3.5% was confirmed with the MPO and assumed for future traffic projections. Summary of the traffic data are presented in Tables 4 & 5.

Table 4: Traffic Data Summary – CR 300 S & CR 875 E				
Year	AADT (VPD)	DHV	TRUCK AADT	Directional Distribution (Positive Direction)
2020 (Current Year)	4,683	11.07%	4.9%	58.6%
2024 (Constr. Year)	5,374			
2039 (Design Year)	10,487			

Table 5: Traffic Data Summary – CR 300 S & CR 975 E				
Year	AADT (VPD)	DHV	TRUCK AADT	Directional Distribution (Positive Direction)
2020 (Current Year)	8,460	7.39%	4.7%	58.38%
2024 (Constr. Year)	9,709			
2039 (Design Year)	18,950			

Traffic data and analysis for the project is provided in Appendix C of this report.

8. CRASH DATA AND ANALYSIS

Vehicular crash data was obtained from the Boone County Highway Department for this report. 2,223 records were received from Boone County from January 2013 to December 2017. The crash records analyzed in the project area indicate that there were 46 crashes from 2013 to 2017. Of the 46 crashes, 42 resulted in property damage, four were personal injury including one fatality, which occurred in 2016 at the intersection of CR 300 S and US 421. The exact locations of these crashes were unable to be determined due to the crash narrative being unavailable. Eight of 46 crashes were rear-end collisions, which represents approximately 18% of all crashes. Of the eight rear-end collisions, one of the collisions resulted in a personal injury in 2016. All other crashes were considered property damage consisting of off-road, right angle and weather. One crash was listed as “other” due to lack of information regarding the type of collision. Appendix D includes the known accident history in the project area from crash data provided and a summary matrix of crashes.

The intersection of CR 975 E and CR 300 S had the highest total number of crashes for any intersection along the project corridor with 20 a total of crashes from 2013 to 2017, which averages to a total of 4 per year. In other information provided by the County, this intersection was noted as repeatedly being in the top 5 intersections of annual crash occurrences in the County. The intersection CR 300 South and US 421 had the second highest total number of crashes during the

same time period. Crashes were analyzed in *RoadHAT* and a summary is provided in Table 3 of the Traffic Study prepared by A&F Engineering for this report, which included in Appendix C.

9. PROJECT ALTERNATIVES

The six segments of the project are summarized as follows:

- Segment 1 – Beginning East of CR 800 E to CR 875 E
 - This is a continuous roadway segment consisting of the widening of CR 300 S.
- Segment 1A – Intersection of CR 300 S and CR 875 E
 - Segment 1A has alternate options for a roundabout or signalized intersection option. Each are designed and estimated independently.
- Segment 2 – CR 875 E to CR 975 E
 - This is a continuous roadway segment consisting of the widening of CR 300 S between each intersection.
- Segments 2A - Intersection of CR 300 S and CR 975 E
 - Segment 2A has alternate options for a roundabout or signalized intersection option. Each are designed and estimated independently.
- Segment 2 – CR 875 E to CR 975 E
 - This is a continuous roadway segment consisting of the widening of CR 300 S.
- Segment 3 – CR 975 E to US 421
 - This is a continuous roadway segment consisting of the widening of CR 300 S.
- Segment 4 – US 421 to CR 1200 E (East County Line)
 - This is a continuous roadway segment consisting of the widening of CR 300 S.

Project alternatives were evaluated to improve Level of Service (LOS) utilizing the information and methodology outlined in the “Intersection Design Guide” published by INDOT. All intersection types were considered using the “Stage 1 Initial, Feasibility, Screening” decision Matrix on page 7 of the Design Guide. Various at-grade intersection configurations and controls were evaluated for their effectiveness and potential of improve the LOS at the intersection.

The alternatives for intersections for at CR 300S/CR 875 E and CR 300S/CR 975 E represent comparisons between traffic signals and roundabouts. The LOS for existing intersections were analyzed in HCM 6 as All-Way Stop controlled (AWSC) intersections. Comparative results are also included for signalized and roundabout options. Those results are presented in Tables 6 & 7 on pages 8 and 9. As shown in the results, for future traffic projections users on the CR 875 E approaches to CR 300 S experience a poor level of service and long delays during peak hours.

Improvements to the intersection of US 421 and CR 300 S were not analyzed or included in this report, as the intersection is under the jurisdiction of the Indiana Department of Transportation. However, the proposed alignment of CR 300 S at US 421 will be conducive to any future intersection improvements that may be planned by INDOT. The roadway and right-of-way cross sections were determined using the Boone County and Town of Zionsville’s Thoroughfare Plans as guidelines and general reference for project development.

Alternative 1 – No Build / Do Nothing

The no build alternative would require the existing All-Way Stop controlled intersections to remain in place with no improvements. AWSC intersections would continue to have issues with rear end collisions, added delay, and other safety issues for motorists. This alternative would do nothing to alleviate the existing and future LOS issues at each intersection. Alternative 1 is not recommended as it does not provide a long-term solution for the project and would not satisfy the purpose and need of the project.

Alternative 2 – Signalize Intersections

This alternative consists of converting the existing AWSC intersections into signalized intersections. Table 6 summarizes the LOS for maintaining the existing AWSC intersection and for the signalized intersection. The LOS in Table 6 is provided for both the AM and PM peaks for each leg of the CR 300 S & 800 E intersection. Table 7 for CR 300 S & N 975 E and for the overall intersection. Future traffic projections which are utilized in the LOS analysis are provided in the worksheet in Appendix C. A preliminary plan and typical cross sections for the preferred alternative are included in Appendix G. The existing and proposed intersection configurations were analyzed in SIDRA and the HCM 6th Edition in conformance and compliance with the requirements of the Indiana department of Transportation’s “Intersection Traffic Analysis Procedures” dated September 2018. Signalized intersections do not perform at a LOS that is better than Alternative 3.

Alternative 3 (Preferred Alternate) – Double Lane Roundabout at Major Intersections

This alternative consists of converting the existing intersections at 875 E and 975 E into two-lane roundabouts with no auxiliary lanes. Side roads approaches are proposed to be a single lane. A preliminary plan and typical cross sections for the preferred alternatives are included in Appendix E. The existing and proposed intersection configurations were analyzed in SIDRA and the HCM 6th Edition in conformance and compliance with the requirements if the Indiana Department of Transportation’s “Intersection Traffic Analysis Procedures” dated September 2018. Although roundabout options are more expensive than signals, roundabouts typically perform and can be expected to perform at a better LOS than modeling typically projects. Roundabouts were also shown to outperform the traffic signal alternatives. Roundabouts are also a much safer and sustainable alternative than traffic signals, as the geometrics and design promote traffic calming by lower speeds through the intersection and lessening the number of conflict points within the intersection.

**TABLE 6
LEVEL OF SERVICE SUMMARY FOR CR 300 S AND 875 E**

APPROACH	AM PEAK				PM PEAK			
	Scenarios				Scenarios			
	1	2A	2B	2C	1	2A	2B	2C
Northbound Approach	A	C	B	A	A	E	B	A
Southbound Approach	A	B	B	A	A	C	B	A
Eastbound Approach	A	B	B	A	A	E	B	A
Westbound Approach	A	C	B	A	B	F	B	A
Intersection	A	C	B	A	B	F	B	A

DESCRIPTION OF SCENARIOS:

SCENARIO 1: Existing Traffic Volumes with Existing Intersection Conditions.

SCENARIO 2A: Year 2039 Projected Traffic Volumes with Existing Intersection Conditions.

SCENARIO 2B: Year 2039 Projected Traffic Volumes with Proposed Intersection Conditions*.

SCENARIO 2C: Year 2039 Projected Traffic Volumes with Proposed Intersection Conditions**.

*The proposed intersection conditions include the addition of an eastbound & westbound lane along CR 300 S and the installation of a traffic signal at the intersection.

**The proposed intersection conditions include the addition of an eastbound & westbound lane along CR 300 S and construction of a roundabout at the intersection.

**TABLE 7
LEVEL OF SERVICE SUMMARY FOR CR 300 S AND 975 E**

APPROACH	AM PEAK				PM PEAK			
	Scenarios				Scenarios			
	1	2A	2B	2C	1	2A	2B	2C
Northbound Approach	A	F	C	B	B	F	C	C
Southbound Approach	A	C	B	A	A	D	B	A
Eastbound Approach	A	F	C	A	B	F	C	A
Westbound Approach	B	F	B	A	C	F	C	A
Intersection	B	F	C	A	B	F	C	A

DESCRIPTION OF SCENARIOS:

SCENARIO 1: Existing Traffic Volumes with Existing Intersection Conditions.

SCENARIO 2A: Year 2039 Projected Traffic Volumes with Existing Intersection Conditions.

SCENARIO 2B: Year 2039 Projected Traffic Volumes with Proposed Intersection Conditions*.

SCENARIO 2C: Year 2039 Projected Traffic Volumes with Proposed Intersection Conditions**.

*The proposed intersection conditions include the addition of an eastbound & westbound lane along CR 300 S and the installation of a traffic signal at the intersection.

**The proposed intersection conditions include the addition of an eastbound & westbound lane along CR 300 S and construction of a roundabout at the intersection.

Other At-Grade Intersection Alternatives

Other Alternatives for at-grade intersections were briefly evaluated but were eliminated for various reasons. For instance, neither a Quadrant Radial Intersection (QRI), a jug handle, a Michigan Left, nor a Partially Diverted Left-hand Turn were feasible because of right of way impacts and additional costs.

10. COST ESTIMATES

Detailed estimates for construction costs and other estimated project costs are provided in Appendix F. All costs are summarized in Appendix F in one convenient table. Table 8 below provides summary of significant costs.

Table 8: Total Cost Summary	
Construction Cost (CN) – Segment 1	\$8,086,900
Construction Cost (CN) – Segment 1A (Signal)	\$3,587,300
Construction Cost (CN) – Segment 1A (RAB)	\$3,751,200
Construction Cost (CN) – Segment 2	\$10,073,400
Construction Cost (CN) – Segment 2A (RAB)	\$5,012,900
Construction Cost (CN) – Segment 2A (Signal)	\$4,798,600
Construction Cost (CN) – Segment 3	\$7,431,800
Construction Cost (CN) – Segment 4	\$9,766,800
Right of Way (Land Acquisition)	\$20,556,000
Utility Cost (CN)	\$6,000,000

Right-of-way costs are presented by section in Appendix F as well. The estimated utility relocation cost shown above was generated as fixed percentage of overall construction cost as a placeholder for the project budget. All soft costs provided for tasks other than construction were conservatively estimated based on the preliminary project plans and the value of construction for each alternative. Bridge costs are itemized individually in Appendix F.

Construction Costs

Construction costs for the project were developed by estimating quantities for each segment of the project. Fixed percentages were used for various pay items (such as Maintenance of Traffic) which is common practice for certain items at this stage of the project. Unit costs were determined using INDOT's database through *Bid Tabs Professional for Indiana* by OMAN Systems, Inc. The preparation of all estimates in this document followed the methodology for the preparation of an *Engineering Assessment Report* prepared for the Indiana Department of Transportation.

Construction costs and other costs are provided for individual segments in Appendix F. Costs are broken down by segment, intersection, and bridge so they can be considered as individual "stand alone" projects.

Right-of-Way Cost Estimation

Preliminary right-of-way costs were determined using a variety of factors. It should be noted that estimated costs were prepared at a programming level for potential budgetary purposes only. Any potential project or acquisition will require approval by a local agency and any potential purchase or transfer, except for those under the jurisdiction of any local agency involving platting, permitting, or improvements regulated by local zoning, subdivision, or building permit ordinances, will require an appraisal of land value and real property. Right-of-way costs fluctuate based on market value. The estimates prepared as part of this report were based on standard practice related to the preparation of an *Engineering Assessment Report* or a typical scoping report. A percent contingency was also included for damages or impacts. Impacts to right-of-way are discussed in greater detail in Section 12 of this report.

Utility Impacts

Utility impacts were estimated as a fixed percentage of construction cost, which is generally customary at the programming stage of any project. Utilities can have a significant effect on overall project budget, planning, and construction. There are several utilities within the corridor. Those between 875 E and US 421 have the greatest potential for being impacted. Utility costs are dependent of a variety of factors including easements. If a utility is located within an easement, (which for the sake of budgeting some are assumed to be in this report) relocation of the utility, including the easement is commonly reimbursable. Provisions for the future relocation of underground and overhead utilities must be addressed during future planning of this project. Utility impacts are discussed further in Section 14 of this report.

Fees and Other Soft Costs

Fees and soft costs associated with design, construction, land acquisition and permitting are broken down by segment in Appendix F, except for environmental permitting. The cost to provide environmental documentation and permitting is typically figured as a lump sum, consisting of several itemized tasks. Environmental matters are discussed in the following section. If any project were pursued individually within the corridor, the environmental approval for the corridor would still be required. If federal funding is pursued for the project, some type of NEPA document and process will need to be followed and provisions for those processes are provided in Appendix F.

11. ENVIRONMENTAL MATTERS

Due to the size of the project and the existing alignment of CR 300 S, a Categorical Exclusion (CE) 4 is anticipated for the project if federal funding is sought for the corridor. For further information, please refer to the *Indiana Categorical Exclusion Manual* published by INDOT. The following items discuss environmental issues of note and typical environmental factors that are evaluated in an Environmental Assessment (EA) document.

Wetlands

The U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) mapping identifies potential wetlands in the project vicinity. Six NWI wetlands were identified within the project area, as follows:

- East of CR 800 East at Jackson Run Tributary – Riverine Wetland
- East of CR 875 East at Jackson Creek – Riverine Wetland
- East of CR 975 East at Eagle Creek – Riverine Wetland/Palustrine Forested Wetlands North and South of CR 300 South
- West of US 421 at Gem Creek – Riverine Wetland
- East of CR 1200 East at Tributary to Little Eagle Creek – Riverine Wetland
- East of CR 1200 East at Tributary to Little Eagle Creek – Palustrine Forested Wetland

In addition to these aforementioned wetlands, there are several lakes that fall north and south of CR 300 S throughout the termini. Field investigation is recommended to evaluate the project site. A Waters of the U.S. Report (WOTUS) should be prepared, and any jurisdictional wetlands delineated therein; coordination with the Indiana Department of Transportation (INDOT) Ecology and Waterway Permitting Section will confirm the presence of any jurisdictional wetlands. If any wetlands other are confirmed within the project area, additional coordination with the US Army Corps of Engineers, Louisville District (USACE) and the Indiana Department of Environmental Management (IDEM) will also be required to define specific permits. Any delineated wetlands should also be identified on the final design plans.

Jurisdictional wetlands delineations and preparation of a WOTUS are required for use of federal aid or local funds. Wetland impacts and a commitment to mitigate adverse impacts would be required in the National Environmental Policy Act (NEPA) document. Copies of wetland mapping inventory information are provided in Appendix A.

Floodplains

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) identify two floodplains in the project area, associated with Jackson Creek, Eagle Creek and Little Eagle Creek. These floodplains parallel their respective water source. All crossings of CR 300 S are transverse to their respective floodplains. This project is not anticipated to affect flood heights or floodplain limits. This project should not increase flood risks or damage; therefore, the project should not adversely affect existing emergency services or emergency evacuation routes. Additional coordination with the Indiana Department of Natural Resources (IDNR) and INDOT Ecology and Waterway Permitting Section will be necessary as part of the project. A floodplain evaluation would be required as part of the NEPA document.

Cultural Resources

There are three potentially historic resources (above and below ground) within the vicinity of CR 300 S and CR 975 E; there are no other potential sites within the termini. None of these sites are listed on or eligible for inclusion on the National Register of Historic Places (NRHP) or the Indiana

State Register of Historic Sites and Structures. The Indiana State Historic Architectural and Archeological Research Database (SHAARD) was reviewed, and a description of each site follows.

Bridge No. 186 is a Notable resource. The bridge (Survey No. 011-699-30041) is listed in the SHAARD database as located at CR 300 S and CR 1000 E. However, according to the Boone County Bridge Inventory, this is the location of Bridge No. 189. Bridge No. 186 is shown in the Bridge Inventory as located on CR 500 S and CR 650 E. In addition, field investigation confirmed that Bridge No. 186, a Pratt Through Truss, is not standing on either CR 300 S or CR 500 S and may have been demolished. An exhibit entitled *Historic Buildings, Bridges and Cemeteries* is attached with a 0.5 mile buffer of the bridge in Appendix A. The SHAARD database may require revision. This discrepancy will need further investigation and clarification.

A contributing resource is located approximately 0.40 mile south of CR 300 S on CR 975 E. It is a circa 1920 Nep-Pioneer log house (Survey No. 011-699-40003). Refer to the *Historic Buildings, Bridges and Cemeteries* exhibit in Appendix A. Its location south of CR 300 S precludes any permanent and temporary impacts.

The third contributing resource is the Hutton Memorial Cemetery located in the northwest quadrant of the CR 300 S intersection with CR 975 E. The cemetery (Survey No. 011-699-30042) was established in 1860 on the former site of the Pleasant View Church. Any road construction within 100 feet of the property line of the cemetery will require the preparation of a Cemetery Development Plan in accordance with IC 14-21-1-26.5 and coordination with the Indiana State Historic Preservation Officer (IN SHPO). Additionally, if any archaeological artifacts or human remains are uncovered during construction, demolition, or earthmoving activities, state law (IC 14-21-1-27 and 29) requires that the discovery must be reported to the IN SHPO within two business days.

The Indiana Historic Bridge Inventory Report (Mead and Hunt, 2010) did not list any of the three bridges along CR 300 S within the termini (Bridge Nos. 189, 192 and 401) as either historic resources or as Select/Non-Select bridges. In the Report, listings for Bridge Nos. 192 and 401 indicated that neither bridge was eligible for the NRHP under criteria A (events) and C (architecture). There was no listing for Bridge No. 189. None of the four small structures (less than 20 feet in length) were inventoried as part of the environmental review.

If federal aid is utilized in any phase of the project, the project area will need to be evaluated by a Qualified Professional (QP) meeting the Secretary of Interior's Professional Qualification Standards for compliance with Section 106 of the National Historic Preservation Act (NHPA) for above ground resources. If permanent right-of-way is required, an assessment of the area by a Professional Archaeologist will be necessary to identify and evaluate impacts to below ground resources as part of the Section 106 compliance. Coordination with INDOT Cultural Resource Office (INDOT CRO) and the Ind the IN SHPO will be required.

Section 4(f) – Section 6(f) Properties

No publicly owned parks, recreational areas, wildlife and waterfowl refuges considered as Section 4(f) properties were identified within the project limits. However, one potentially historic property, the Hutton Memorial Cemetery, is at the intersection of CR 300 S and CR 975 E. Section 4(f) of the US Department of Transportation Act of 1966 prohibits the use of public parks, recreational facilities, wildlife refuges or historic sites for federally funded transportation facilities unless there is

no feasible and prudent alternative to such use. A Section 4(f) Evaluation may be required if the cemetery is determined eligible for listing on the NRHP by the IN SHPO and impacts to the cemetery are anticipated.

No potential Section 6(f)3 sites were identified within the project area. The National Park Service (NPS) Land and Water Conservation Fund (LWCF) was created through the Land and Water Conservation Fund Act of 1965. Section 6(f)3 of the Act prohibits the conversion of LWCF lands unless the NPS approves the conversion of property with property of reasonable equivalent usefulness and location and of at least equal fair market value. As there are no sites encumbered by Section 6(f)3 funds within the project area, a Section 6(f)3 Case Study Report will not be necessary.

Environmental Land Use Features

The primary land use within the project limits is wooded and agricultural and low-density residential west of US 421. Residential properties generally concentrated in subdivisions are intermittent between CR 800 E and US 421; residential use dominates from US 421 to CR 1200 E. An eight-inch refined products pipeline crosses through the project area in the vicinity of US 421. Wooded riparian corridors along Jackson Creek and its tributaries, and Eagle Creek and Little Eagle Creek and its tributaries. Agricultural fields in crop production are located along the south side of CR 300 S, around the western terminus and outside of the immediate project location. Topography along CR 300 S varies from approximately 900 – 925 feet above Mean Sea Level (MSL). The largest down gradients are at stream crossings where the channels fall to approximately 850 – 860 MSL. If any of the proposed construction activities impact the wooded areas, coordination with the US Fish and Wildlife Service (USFWS) and the IDNR is recommended.

Various public facilities are located within the project corridor. The Union Elementary School is on the north side of CR 300 S and just west of CR 1200 E. Further to the east at CR 1200 E, four recreational trails traverse north, east and northeast from the intersection with CR 300 South; one other trail begins at CR 300 S and CR 800 E and extends to the west. Another recreational facility, the Holliday Nature Preserve, is south of CR 300 S on CR 975 E. As stated, the Hutton Memorial Cemetery is immediately northwest of the intersection of CR 300 S and CR 975 E.

The Indianapolis Urban Area Boundary (UAB) is within the general project vicinity. Between CR 800 E and US 421, the boundary is irregular and within 0.5 mile to the south. From US 421 to CR 1200 E, the UAB extends north to the south side of CR 300 S.

Noise

As proposed, the addition of through traffic lanes within the termini would be a Type I project. In accordance with 23 CFR 772 and the (2017) INDOT Traffic Noise Policy, this action requires a formal noise analysis.

All construction equipment will be required to comply with the Occupational Safety and Health Administration's (OSHA) regulations. Proper construction equipment maintenance with original exhaust equipment will help to mitigate any impacts. Additionally, the contractor will be required to follow best management practices to reduce noise impacts from construction equipment. These provisions should be incorporated into the project specifications if the project advances.

Aviation

The Federal Aviation Administration (FAA) website was checked, and one public airport was within 3.8 miles (20,000 feet) of the project. The Indianapolis Executive Airport is approximately 1.7 miles (9,100 feet) north of CR 300 S and west of CR 1200 E. Access to the airport is via SR 32 east of US 421.

Records Review and Hazardous Materials

A desktop investigation of the project area was completed. Various hazardous material (hazmat) sites of concern were identified within a 0.5-mile radius of the project area. An eight-inch refined products pipeline crosses through the project area in the vicinity of US 421. A leaking underground storage tank (LUST) is on a commercial printing company property located on the south side of CR 300 S approximately 0.25 mile west of CR 1200 E. Lastly, five National Pollutant Discharge Elimination System (NPDES) facilities have been located in the Brookhaven and Preserve at Bear Creek subdivisions near CR 1200 S. These points are most likely related to storm water discharges to the detention ponds in each subdivision. No other hazmat concerns were noted.

Air Quality

This project is not of a type qualifying as a categorical exclusion (Group 1) under 23 CFR 771.117(c), and is not exempt under the Clean Air Act conformity rule under 40 CFR 93.126, and as such, a Mobile Source Air Toxics analysis is required. Conformance of the project with the 2018-2021 Indiana Statewide Transportation Improvement Program (STIP) must be completed as part of the environmental documentation.

Endangered, Threatened and Rare Species

The Boone County listing of the Indiana Natural Heritage Data Center information on endangered, threatened and rare (ETR) species, high quality natural communities and natural areas was reviewed. No ETR species and significant areas were documented within 0.5 mile of the project area. Coordination with the IDNR Division of Fish and Wildlife is recommended as part of the environmental document process.

A review of the USFWS database did not indicate the presence of endangered bat species in or within 0.5 mile of the project area. Additional investigation to confirm the presence or absence of bats will be necessary. The range-wide programmatic consultation for the Indiana Bat and Northern Long-eared Bat will need to be completed according to the most recent "Using the USFWS's IPaC System for Listed Bat Consultation for INDOT Projects".

An inquiry using the USFWS IPaC website did not indicate the presence of the federally endangered species, the Rusty Patched Bumble Bee, in or within 0.5 mile of the project area. No impact is expected.

Permits

The following permits will most likely be required, especially for bridge and small structure projects.

Section 401 Water Quality Certification (WQC)

An IDEM Regional General Permit (RGP) may be required for the project if there are impacts to "Waters of the State", which include streams and wetlands. The IDEM RGP is utilized for stream impacts less than 300 linear feet, wetland impacts less than 0.1 acre and no fill placed to restrict

the existing low flow channel area. An individual Section 401 WQC may be required for project impacts greater than 0.1 acre of wetlands, impacts to streams greater than 300 linear feet or restrictions to the existing low flow waterway area. This determination will be made in consultation with the INDOT Ecology and Waterway Permitting Section and IDEM.

Section 404 Permit for Discharge of Dredged or Fill Material

A Section 404 Permit may be required from the US Army Corps of Engineers (USACE), Louisville District. A Regional General Permit No. 1 or a Nationwide Permit will be required for project impacts to "Waters of the US" up to one acre. Impacts to "Waters of the US" below the Ordinary High-Water Mark (OHWM) greater than one acre will require an Individual Section 404 Permit. This determination will be made in consultation with the USACE.

Local Stormwater Management and Control Permits

Local MS4 agencies will require that all construction follows Rule 5 permitting processes. Provisions for individual permits are included in Appendix F.

12. RIGHT OF WAY IMPACTS

Based on preliminary research from GIS data, the preferred alternative project requires additional right-of-way along CR 300 S. An estimate of right of way was completed using the preliminary designs and shown on the exhibits in Appendix E. The following table summarizes the estimated permanent and temporary right of way required to construct the project.

Table 9: Total Right-of-Way Summary

Segment	Estimated Number of Affected parcels	
	Permanent	Temporary
800 E to 875 E (Seg. #1)	22	6
875 E to 975 E (Seg. #2)	29	5
975 E to US 421 (Seg. # 3)	28	8
US 421 to 1200 E	32	4
Total	111	23

Physical Features

After completing field research and site visits and based on the information obtained at the public hearing, there were several impacts noted that will be caused by the project. A general estimate with contingency for these items was figured in the costs for right-of-way acquisition. There are several unique items located within the project corridor they include:

- A custom decorative wall in subdivision common area along CR 300 S near Rue Chateaux Lane will require attention during project development. Relocation of the wall will require a significant task and expense.
- Several properties along the corridor have horse fences which abut the corridor. Horse fencing is unique and is neither constructed nor priced similarly to normal fencing.
- Several properties have custom brick or stone driveway entrances and gates.
- Septic tanks and wells should be of special consideration west of CR 975 E. During the public meeting, it was noted several homes were built on smaller lots abutting CR 300 S and the septic tanks are located in the front yard. This will require further investigation during project development and most likely some type of mitigation during design. These facilities will need to be located during a topographic survey and the survey notice should alert owners that the surveyors need to be made aware of wells and septic tanks.
- As previously mentioned in this report, provisions were made in the creation of the new alignment for CR 300 S to limit the project effects on the Hutton Cemetery.

- Dog fences and other such security and containment systems exist along the corridor.
- A pond was recently constructed in the floodplain adjacent to Eagle Creek west of Rue De Chateaux Lane in 2019 or 2020. A copy of the permit application was provided by Town and County officials in order to make an attempt to discuss the project with the owner and owner's representative and the effects that it could have on the project. Several phone calls to the applicant's agent listed as the contact for the project went unreturned. The notification information is on file with Boone County.
- Two homeowners east of US 421 were concerned that the roadway was being widened in existing right-of-way and the existing roadway and trail would be closer to their property.

13. RAILROAD IMPACTS

There are no existing railroads within the vicinity of the project area.

14. UTILITY IMPACTS

During the site visit and the responses from the initial notices, various utilities were found to exist within the project limits. Below is a list of existing utilities that are believed to be located within the proposed project limits:

Electric:

Boone County REMC
Attn: Randy Campbell
1207 Indianapolis Avenue
Lebanon, IN 46052

Duke Energy
Attn: Cindy Rowland
100 S. Mill Creek Road
Noblesville, IN 46062

Boone County REMC has an overhead electric line located along north side for segment 1 (CR 800 E to CR 875 E), south side of 300S to halfway between 875 E to 975 E then switches to the north side approximately 200 feet East of US 421 and runs parallel to the road.

Telephone/Cable/Internet:

AT&T
Attn: Matt Spindler
240 N. Meridian St., Room 1791
Indianapolis, IN 46204

Spectrum
Attn: Ron Hinrichs
3030 Roosevelt Avenue
Indianapolis, IN 46218
Attn: Ron Hinrichs

TDS Telecom
Attn: Michael Johnson
16924 West Victor Road
New Berlin, WI 53151

Fiber optic:

Century Link
Attn: John Unverferth
1410 West Center St.
Warsaw, IN 46580

RVP Fiber Company, LLC
Attn: Ryan Miedema
201 Iona Ave. SW
Grand Rapids, MI 46701

Zayo Bandwidth
Attn: Waylon Higgins
9209 Castlegate Dr.
Indianapolis, IN 46256

Water:

Citizens Energy Group
2150 Dr. Martin Luther King Jr. Street
Indianapolis, IN 46202

Gas:

Vectren Energy Delivery
Attn: Public Project
16000 Allisonville Road
Noblesville, IN 46061

Petroleum pipeline:

Country Mark cooperative
Attn: Tony Fehrenbacher
1200 Refinery Road
Mt. Vernon, IN 47620

15. PUBLIC INVOLVEMENT

The scope of this report had provisions for three public meetings, which included one general public meeting/open house and one presentation each to Zionsville Town Council and the Boone County Commissioners to discuss the project. A general public open house was conducted on October 10, 2019 at 6 PM in Zionsville Town Hall. A press release was issued by the Town and the meeting was announced in the Zionsville Current and the Lebanon Reporter newspapers. Approximately 125 notices were also mailed directly to addresses along the project corridor. Addresses of property owners were obtained from Boone County GIS. Approximately 125 people attended the meeting, which included an opening presentation with a breakout session with different stations based on project location to answer any concerns and questions. Comment cards were provided at each breakout station for questions and responses. Copies of all meeting information including the presentation, meeting notices, the attendance sheets, and response cards are provided in Appendix G. The primary concern with the project expressed at the public open house was the potential impacts to properties.

A presentation to summarize the project and preliminary findings of this report was given at a regular public meeting of the Boone County Commissioners on February 18, 2020. A copy of the presentation given at the Commissioners' meeting is provided in Appendix G. Unfortunately, due the COVID-19 pandemic and other factors in early 2020, the meeting with the Zionsville Town Council and the conclusion of the report was delayed and put on hiatus until December of 2020. A presentation for the project was completed for the Zionsville Town Council via "Zoom" as part of the Council's publicly advertised agenda on December 7, 2020. The same presentation was provided to the Town of Zionsville and the Boone County Commissioners. Each meeting was publicly advertised.

16. CONCLUSION

The project is a significant corridor in Boone County and Zionsville as indicated by the Thoroughfare Plans for both the County and Town. It is also an important corridor that links Boone County to Hendricks and Hamilton Counties. The final segment in Hamilton County, just east of the County Line, is presently under construction. It is an important feature of the local transportation infrastructure as indicated by its Functional Classification. It will be a significant factor in the future development of the area. It is the intent of this document to be used for the future planning of areas adjacent to the corridor so impacts can be minimized in the future.