

To: **Louis Agresta**
*Clark County Springfield Transportation
Coordinating Committee (CCSTCC)*

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Subject: St. Paris Trail Feasibility Study
Alignment Analysis

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Section 1.0: Introduction

The purpose of this feasibility study is to review and evaluate alternatives for a new east to west multi-use trail along an abandoned railroad right-of-way (RW) in western Champaign County for the Clark County-Springfield Transportation Coordinating Committee (CCSTCC) in cooperation with the Village of St. Paris and the Logan-Union-Champaign Regional Planning Commission. The evaluation will include recommendations for treatments at roadway crossings or where the trail may leave the abandoned railroad RW, general condition of existing structures that could be reused, and connectivity recommendations for the adjacent regional trail networks at either end of the study corridor. The abandoned RW extends between Piqua and Urbana and has been acquired by adjacent property owners. The corridor study limits extended from the Miami County Line, just east of CR 21 / South Elm Tree Road to the City of Urbana. The corridor was broken into four segments to assist with prioritization and funding efforts led by the Village of St. Paris. The segments identified are listed below:

- Segment 1 – Within the Village of St. Paris, between SR 235 and CR 26 / Heck Hill Road, approximately 2.75 miles.
- Segment 2 – West of the Village of St. Paris, between the Miami County Line (east of CR 21 / South Elm Tree Road) to SR 235, approximately 2.2 miles.
- Segment 3 – East of the Village of St. Paris, between CR 26 / Heck Hill Road to SR 560, approximately 5.5 miles
- Segment 4 – West of the City of Urbana, from SR 560 to the Simon Kenton Trail near US 36 in Urbana, approximately 4.2 miles

In this study, Burgess and Niple (B&N) evaluated the connectivity between several key locations. Within the Village of St. Paris, the project stakeholders identified several destinations for trail connections. These included the pony wagon factory that serves as a museum for St. Paris, Harmon Memorial Park, and Graham High School. From a regional perspective, the future trail will provide connectivity to planned or established trail systems in the area. At the western end of the study corridor, the Miami County Park District has paved portions of the corridor in Miami County and anticipates extending the paving efforts easterly to the county line through the next several years. The completion of Segment 1 and 2 will connect the Village of St. Paris to the portion of trail completed in Miami County. This connection will facilitate access by trail users to the Great Miami River Trail that travels from Hamilton/Fairfield to north of Piqua. To the east, the completion of trail segments 3 and 4 into Urbana will provide a connection to the Simon Kenton Trail, which travels from Cincinnati to Bellefontaine. The Village of St. Paris is part of the Great Ohio Cycling Circuit. **Exhibits 1.1, 1.2 and 1.3** illustrate an overview of the corridor limits and key locations and connections.



Exhibit 1.1 – Study Limits (photo credit: Google Maps)

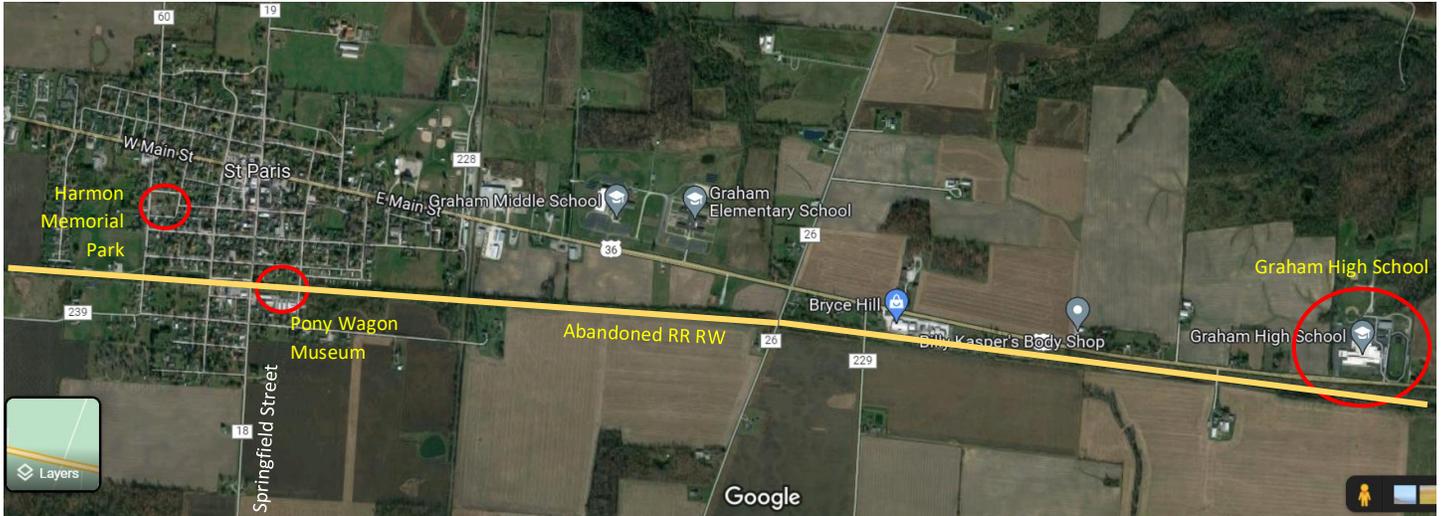


Exhibit 1.2 – Connections within St. Paris (photo credit: Google Maps)



Exhibit 1.3 – Trail System Connections (photo credit: Traillink.com)

Section 2.0: Stakeholder Coordination and Alternative Development Process

B&N met with the stakeholders for an initial brainstorm session (Stakeholder Meeting 1) on October 20, 2021 to discuss each segment and the opportunities and challenges each segment presented. Key locations, destinations and areas were identified during the discussion. The Village officials and stakeholders prioritized the segments, identifying Segment 1 (within the Village of St. Paris) as the highest priority. Secondary priorities included determining appropriate ties to the western segment of trail under development by Miami County and to the Simon Kenton Trail to the east, identifying safe at-grade crossing treatments for the state, county and local routes the proposed trail will need to cross, and providing a safe crossing at the active north-south rail line at the eastern side of the Village.

B&N facilitated a second stakeholder meeting (Stakeholder Meeting 2) on January 24, 2022, where B&N shared exhibits of the potential alignments, results of their initial evaluation of the alignments, and opportunities and challenges with each. The goal of the second meeting was to narrow the alignments down for further study and capture feedback from the stakeholders.

Section 3.0: Existing Conditions

B&N performed a site visit of the abandoned railroad corridor and surrounding area to observe the existing conditions and discover any possible challenges that were not previously brought up or apparent from Google Earth. Aerial footage of the abandoned railroad RW and key locations such as existing bridges, crossings, and culverts were captured using drone footage.

Throughout the four study segments, there is an abandoned railroad corridor which could serve as a significant portion of the trail alignment. The railroad was abandoned approximately 30 years ago. In some areas the existing railroad ballast is present, in others the ballast was removed, or erosion washed away the ballast and surrounding soils. The existing ditch line on either side of the ballast has not been maintained, and existing culverts and structures were not maintained. In some locations, the existing superstructure was removed. Most of the land in which this abandoned railroad corridor resides on is privately owned and would require acquisition. There are multiple roadway crossings. Roadways vary from state to county to local roadways. Overall, there are no major utilities that the stakeholders were aware of within the abandoned railroad RW except for a fiber optic agreement for placement within the Village limits. Within each segment several alternatives were studied at specific locations to address challenges, connection to identified points of interest, and crossing strategies.

Segment 1

Segment 1 falls within the Village of St. Paris, extending between SR 235 and CR 26 / Heck Hill Road and is approximately 2.75 miles in length. **Exhibit 3.1** illustrates the segment limits for Segment 1.

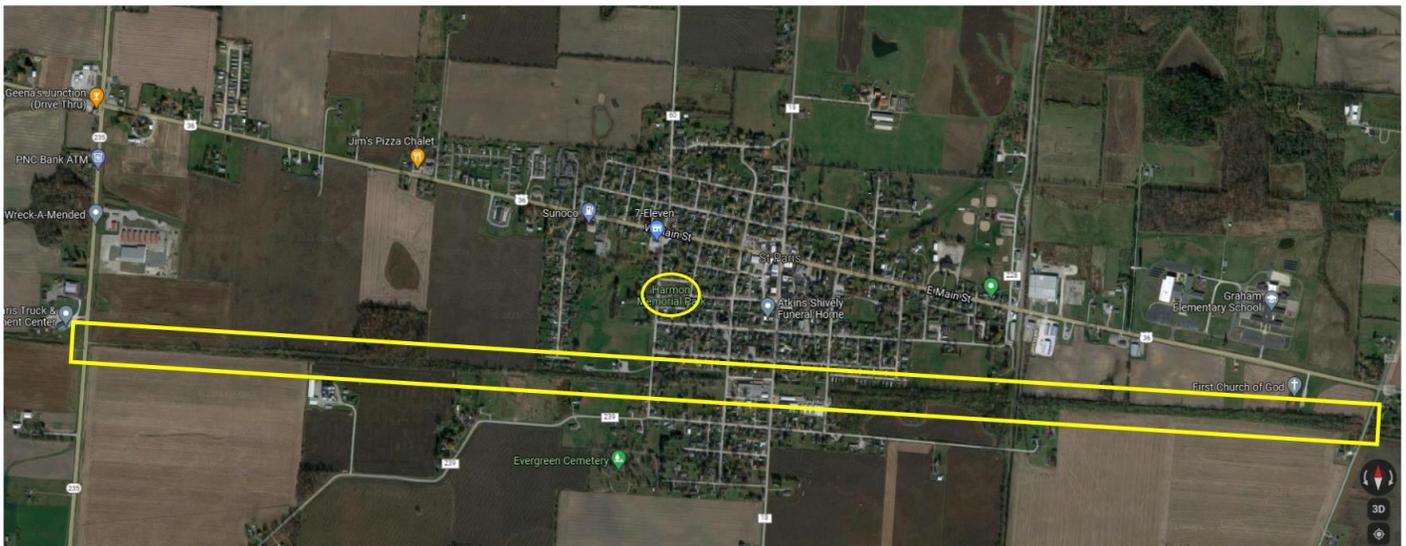


Exhibit 3.1: Segment 1 limits (photo credit: Google Maps)

This segment includes three roadway crossings outside of the local street system within the Village of St. Paris – SR 235, South High Street, and CR 26 / Heck Hill Road. **Table 3.1** provides the existing roadway data at these three crossings.

Table 3.1: Segment 1 Roadway Crossings

Roadway	Roadway Classification	Posted Speed	No. Lanes	AADT (if known)*
SR 235	Major Collector	55 mph	One lane / direction	3,302
S High Street	Local	25 mph	One lane / direction	
CR 26 / Heck Hill Rd	Local (south of US 36) Minor Collector (north of US 36)	45 mph	One lane / direction	1,015

* AADT based on available ODOT TIMS data

During the stakeholder meeting, the stakeholders noted that the abandoned railroad RW is owned by 6 different landowners. Within this segment, portions of the abandoned railroad RW have existing structures constructed within the RW footprint. There are several alleys that parallel the abandoned railroad RW that could serve as on street connections. The stakeholders noted that the Village owned solar panels have a bored fiber through the abandoned railroad RW onto the west side of the water treatment plant. **Photo 3.1** illustrates the abandoned railroad RW and several of the structures that were constructed within the existing rail bed area.



Photo 3.1 – Existing structures (in yellow circle) within the abandoned railroad RW (blue highlight)

The Village streets within this area are low volume. Some have continuous sidewalks while others do not have continuous sidewalks. It has been noted that residents walk along the street in several areas. Walnut Street was identified as a potential on street connection due to its relative width. Two destinations were identified within the Village limits – the Pony Wagon Museum and Harmon Memorial Park, shown in **Photo 3.2**.



Photo 3.2 – Pony Wagon Museum (in yellow circle) and Harmon Memorial Park (in blue circle) with respect to the abandoned railroad RW (blue highlight)

At the eastern side of town, the abandoned railroad formerly had an overpass structure over an active north-south rail line. The superstructure has since been demolished, creating a gap in the potential trail if it follows the railroad alignment. The existing abutments remain and appear to be in good condition. **Photo 3.3** illustrates the crossing.



Photo 3.3 – Existing abutments at former rail overpass over active rail line

To the north of the former abandoned railroad crossing, US 36 has an established at-grade crossing with the active rail line that includes lights and gates. To the south, South Troy Street, a Village owned roadway, has an established at-grade crossing with the active rail. This crossing provides access to a private property and does not have gates to block the crossing when a train approaches. **Photo 3.4** illustrates the crossing at the Village owned roadway.



Photo 3.4 – At-grade crossing on East Troy Street south of abandoned railroad RW

The stakeholders also noted an existing at-grade crossing off Huffman Road / Dump Road within Village owned property approximately 0.66 miles north of US 36.

Within the Village no flooding concerns have been identified. Just west of S High Street, an existing culvert conveys a stream under the abandoned railroad RW. **Photo 3.5** illustrates the condition of the existing culvert.



Photos 3.5 – Culvert just west of S High Street

Segment 2

Segment 2 extends west of the Village of St. Paris, between the Miami County Line (east of CR 21 / South Elm Tree Road) to SR 235 (where Segment 1 begins) and is approximately 2.2 miles in length. This segment is primarily flanked by fields that are actively farmed.

Exhibit 3.2 illustrates the segment limits for Segment 2.



Exhibit 3.2: Segment 2 limits (photo credit: Google Maps)

This segment includes two roadway crossings – CR 6/ N. Bollinger Road and CR 21 / South Elm Tree Road. **Table 3.2** provides the existing roadway data at these two crossings.

Table 3.2: Segment 2 Roadway Crossings

Roadway	Roadway Classification	Posted Speed	No. Lanes	AADT (if known)*
CR 6 / N Bollinger Road	Local	45 mph	One lane / direction	105
CR 21 / Elm Tree Road	Local	45 mph	One lane / direction	300

* AADT based on available ODOT TIMS data

This segment contains several culverts. Additional inspection of these culverts is recommended to determine the condition and potential repair or replacement costs.

Segment 3

Segment 3 begins just east of the Village of St. Paris, at CR 26 / Heck Hill Road and extends to SR 560, and is approximately 5.5 miles in length. **Exhibit 3.3** illustrates the segment limits for Segment 3.

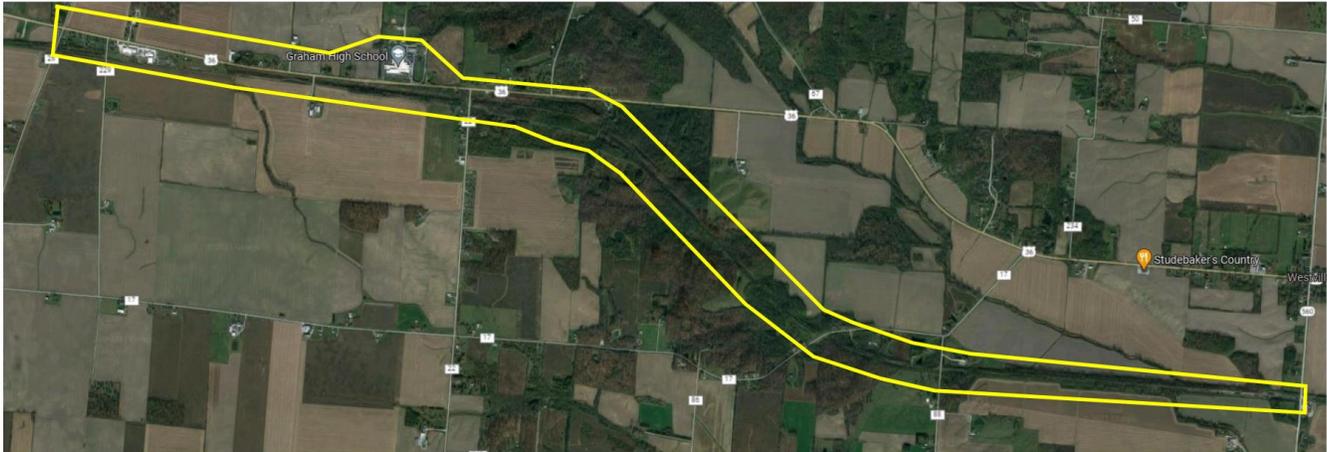


Exhibit 3.3: Segment 3 limits (photo credit: Google Maps)

This segment includes five roadway crossings – TR 229 / Fueston Road, Kite Road, CR 17 / Runkle Road, TR 88 / Troy Hill Road, and SR 560. **Table 3.3** provides the existing roadway data at these five crossings.

Table 3.3: Segment 3 Roadway Crossings

Roadway	Roadway Classification	Posted Speed	No. Lanes	AADT (if known)*
TR 229 / Fueston Road	Local	45 mph	One lane / direction	
Kite Road	Minor Collector	45 mph	One lane / direction	488
CR 17 / Runkle Road	Minor Collector	45 mph	One lane / direction	672
TR 88 / Troy Hill Road	Local	45 mph	One lane / direction	
SR 560	Major Collector	55 mph	One lane / direction	2,396

* AADT based on available ODOT TIMS data

Just east of Fueston Road, the abandoned railroad RW travels through the Bryce Hill Inc. property. The existing structures on the property are immediately adjacent to the abandoned railroad RW area. The stakeholders noted that locating a trail along this property would likely require fencing to provide separation from the property and require coordination with the property owner to reestablish access to the storage area to the east of the buildings. **Photo 3.7** illustrates the Bryce Hill Inc. property and the abandoned railroad RW.

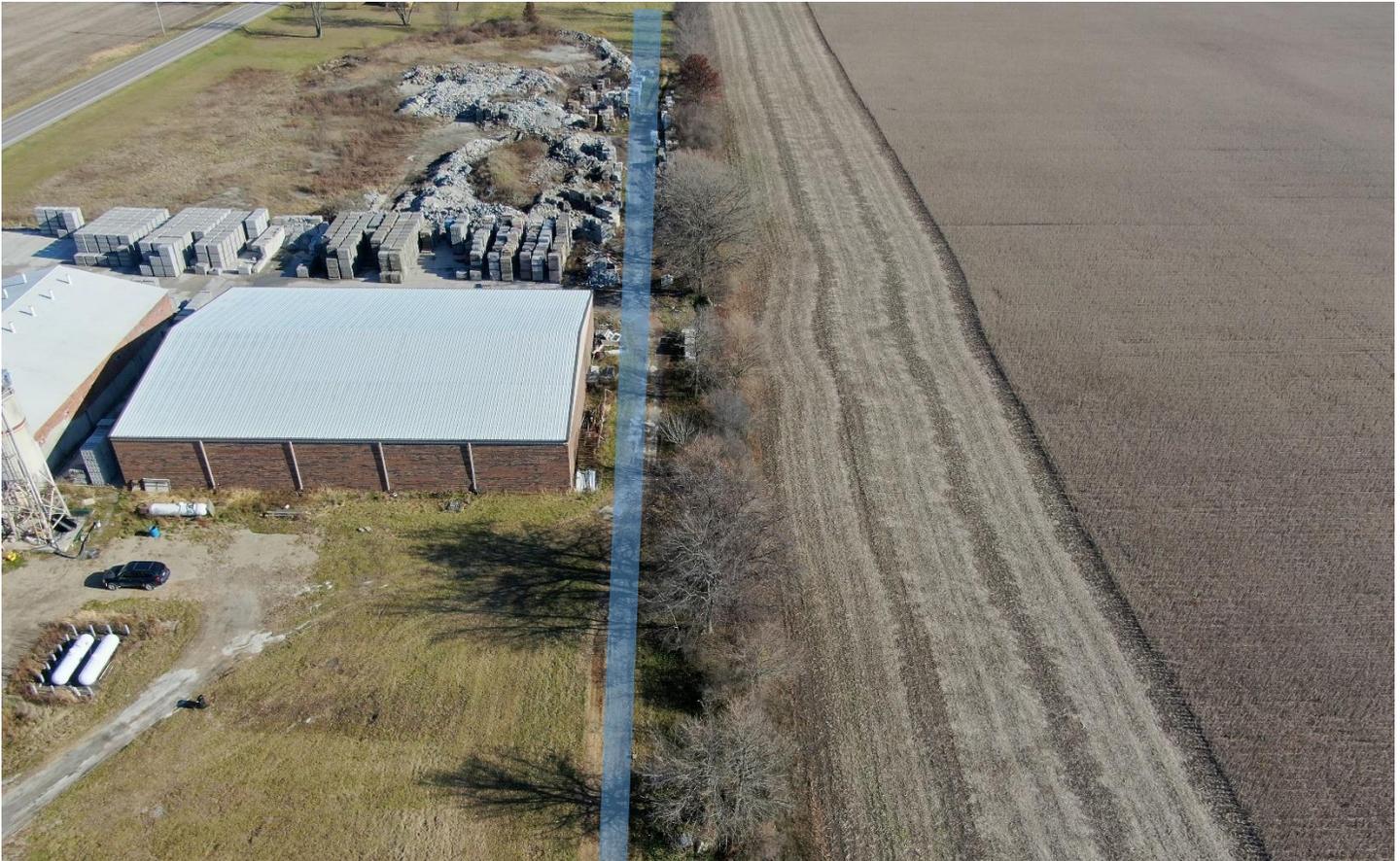


Photo 3.7 – Abandoned railroad RW (blue highlight) and Bryce Hill Inc. property

Graham High School falls within the Segment 3 limits. The school was identified by the stakeholders as a key destination for a connection to the trail. Between the abandoned railroad RW and the school is some embankment that would require mitigation to provide a connection. The crossing on US 36 was discussed as a concern for the stakeholders to ensure students and other pedestrians using the trail to access the school could safely cross the minor arterial. Within this area the posted speed limit of US 36 is 55 mph with a school zone speed of 20 mph during the school drop off and pick up hours. **Photo 3.8** illustrates the abandoned railroad RW, embankment and school entrance area.



Photo 3.8 – Abandoned railroad RW (blue highlight), embankment, and school entrance

West of the CR 22 / Kite Road crossing, where the abandoned railroad RW curves to the southeast, the stakeholders identified a concern about the grade in this area of the railroad. It appeared that the grade could be steep, and the stakeholders requested that the grade be investigated to determine compliance with all Americans with Disabilities Act (ADA) accessibility requirements, or if mitigation measures would be needed for compliance.

The stakeholders identified drainage and erosion issues near Runkle Road. An existing culvert crosses the abandoned railroad RW and significant erosion due to failure of a culvert on the inlet side of the culvert has been documented in this area. There has been coordination with the property owner, Village and County Engineer to acquire fill in this area to address the erosion issues, although it had not been remediated to date. **Photo 3.9** captures the culvert and the erosion that has happened at this location.



Photo 3.9 – Existing culvert inlet, outlet, and erosion near Runkle Road

East of Troy Hill Road, the abandoned railroad RW crosses Nettle Creek. The existing structure is intact and appears to be in okay condition. Some minor rehabilitation to the concrete may be necessary. **Photo 3.10** illustrates the crossing.



Photo 3.10 – Abandoned railroad RW (blue highlight) and Nettle Creek crossing

At SR 526, the County has a materials storage site located on the western side of SR 560 within the abandoned railroad RW. **Photo 3.11** illustrates the material storage area.



Photo 3.11 – Materials storage within the abandoned railroad RW

Segment 4

Segment 4 begins west of the City of Urbana at SR 560, and ends at the Simon Kenton Trail near US 36 in Urbana. This segment is approximately 4.2 miles in length. **Exhibit 3.4** illustrates the segment limits for Segment 4.



Exhibit 3.4: Segment 4 limits (photo credit: Google Maps)

This segment includes five roadway crossings – TR 89 / Bair Road, Muzzy Road and S Edgewood Avenue. **Table 3.4** provides the existing roadway data at these three crossings.

Table 3.4: Segment 4 Roadway Crossings

Roadway	Roadway Classification	Posted Speed	No. Lanes	AADT (if known)*
TR 89 / Bair Road	Local	45 mph	One lane / direction	
Muzzy Road	Local	45 mph	One lane / direction	
S Edgewood Avenue	Major Collector	25 mph	One lane / direction	2,293

* AADT based on available ODOT TIMS data

At the TR 89 / Bair Road crossing, the abandoned railroad RW crosses Anderson Creek. There are two existing structures at this creek crossing, one of which has an existing residential building constructed on it. The other structure serves as the driveway for the property. **Photo 3.12** illustrates the existing structures and residential building and driveway.



Photo 3.12 – Anderson Creek crossing

Two culverts were identified between TR 89 / Bair Road and the existing stone quarry. It appears both culverts are in fair condition and can likely be reused with minor rehabilitation. The eastern most culvert is adjacent to an existing bridge. **Photo 3.13** illustrates both culverts and the existing bridge.



Photo 3.13 – Existing Culverts and bridge

The abandoned railroad RW crosses the Mad River and enters the Urbana Materials property. The Urbana Materials company is a quarry that produces sand and gravel. The existing structure over the Mad River will require re-decking to be utilized for the trail. **Photo 3.14** illustrates the existing bridge.



Photo 3.14 – Existing structure over the Mad River

Within the abandoned railroad RW, the Urbana Materials installed a conveyor system that spans the abandoned RW. Trucks currently utilize the RW to access various parts of the property from Muzzy Road, to the east. Once east of the Urbana Materials ponds, the abandoned railroad RW intersects Muzzy Road and the rail line becomes active. The Simon Kenton Trail has a trail connection to the east of this location, along Mad River Pike / College Way. **Exhibit 3.5 identifies** the end point of the abandoned railroad RW and the Simon Kenton trailhead.



Exhibit 3.5 – Study Corridor Entering Urbana (photo credit: Google maps)

The stakeholders noted that Muzzy Road is a low volume roadway but is utilized predominantly by trucks accessing the gravel company property. Muzzy Road crosses S Edgewood Avenue, a higher volume major collector. This crossing was another location of concern for trail user safety. Similarly, Mad River Pike is a low volume roadway with narrow shoulders.

Section 4.0: Alternatives Considered

Using the stakeholder feedback from Stakeholder Meeting 1 and the observations from the site visit, alternatives were identified within each segment.

Typical Section

The trail typical section varies based on the location of the trail. The studied alternatives identified several potential locations: a trail within the abandoned railroad RW, a trail adjacent to a roadway, and a trail along a roadway. The typical section for the trail within the abandoned railroad RW follows the *ODOT Location and Design (L&D) manual, Volume 1, Section 702*. The proposed trail width is 10', with 5' graded shoulders and 4:1 fore slope. Where the fore slopes require a steeper slope, fencing was included in the cost estimate to protect trail users from the slope. **Exhibit 4.1** illustrates the typical section on the abandoned railroad RW.

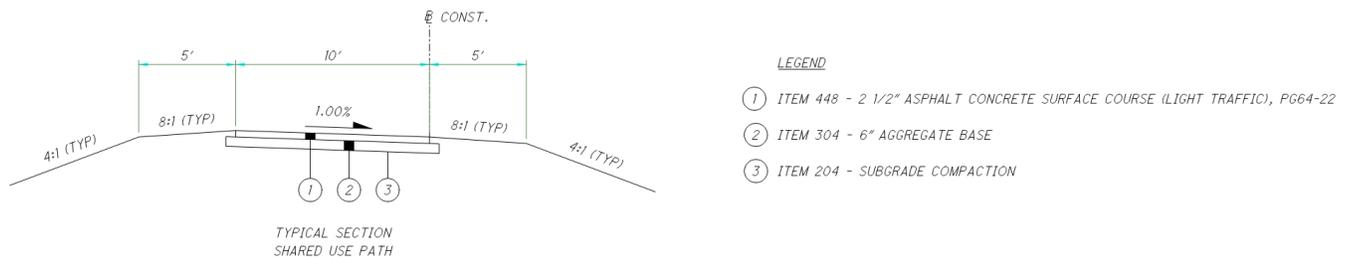


Exhibit 4.1 – Trail Typical Section on Abandoned Rail Bed

When located along a roadway, the trail location will follow the *ODOT L&D Volume 1 Section 702.2.2* requirements for offset from edge of traveled way or edge of paved shoulder. The minimum offset from the edge of traveled way or edge of paved shoulder is 5'. The trail width of 10' with 2' graded shoulder on either side of the trail was assumed. **Exhibit 4.2** illustrates the trail typical section when adjacent to a roadway.

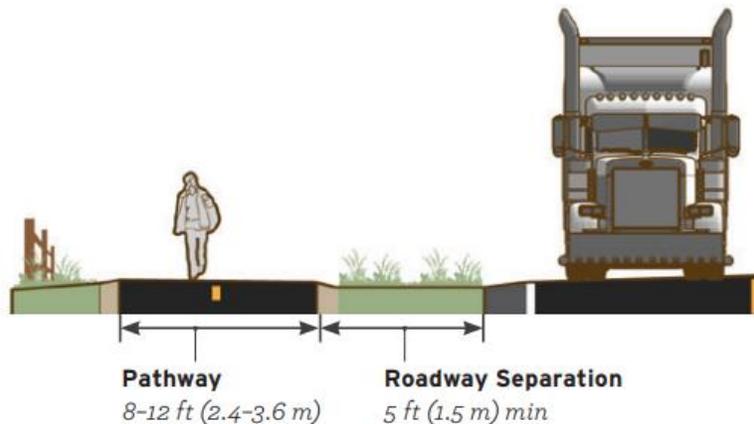


Exhibit 4.2 – Trail Typical Section adjacent to roadway (image credit: Small Town and Rural Multimodal Networks, FHWA)

Within the Village of St Paris, there are several alternatives with a proposed trail on the existing roadway. When the trail is located on the roadway, a shared roadway or “yield” roadway typical section is anticipated. **Exhibit 4.3** illustrates a yield roadway.

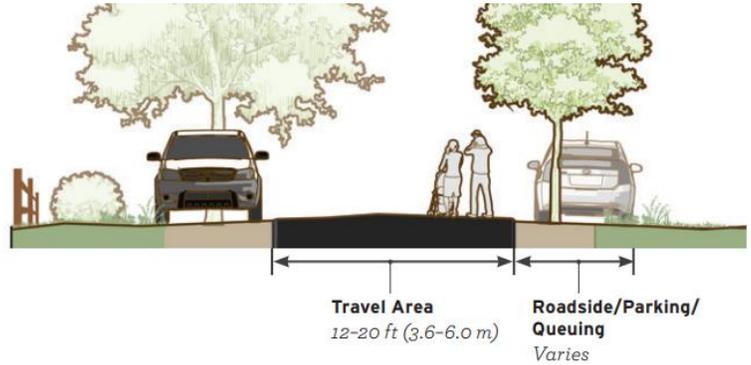
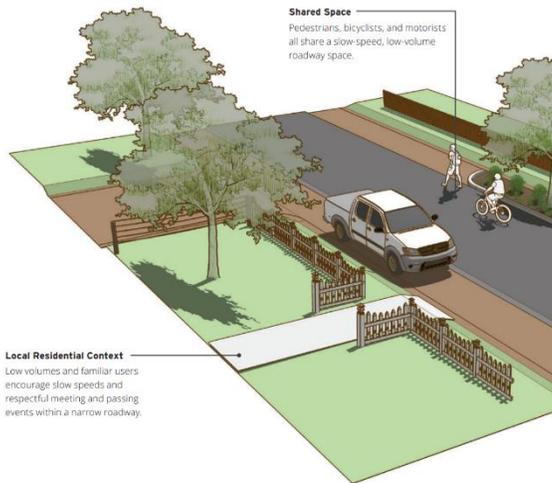


Exhibit 4.3 – Shared or Yield Roadway (image credit: Small Town and Rural Multimodal Networks, FHWA)

This will include “Share the Road” signage and markings, with bicycles located on the roadway and pedestrians on the adjacent sidewalk. For areas where sidewalk is not present, it is anticipated pedestrians will utilize the roadway and appropriate “Pedestrian On Roadway” signage provided. **Exhibit 4.4** illustrates the various shared roadway signage that may be utilized. No revisions to the roadway typical section are anticipated in this scenario.



Exhibit 4.4 – Shared Roadway Signage

Roadway Crossing Applications

To address trail user safety at the various roadway crossings throughout the study corridor, crossing markings and enhancement applications were identified to provide various levels of visibility. The Small Town and Rural Multimodal Networks guide, published by the Federal Highway Administration (FHWA), provides guidance for facility design in small town and rural applications. The guide provides recommendations for crossing applications based on traffic volume and speed, illustrated in **Exhibit 4.5**.

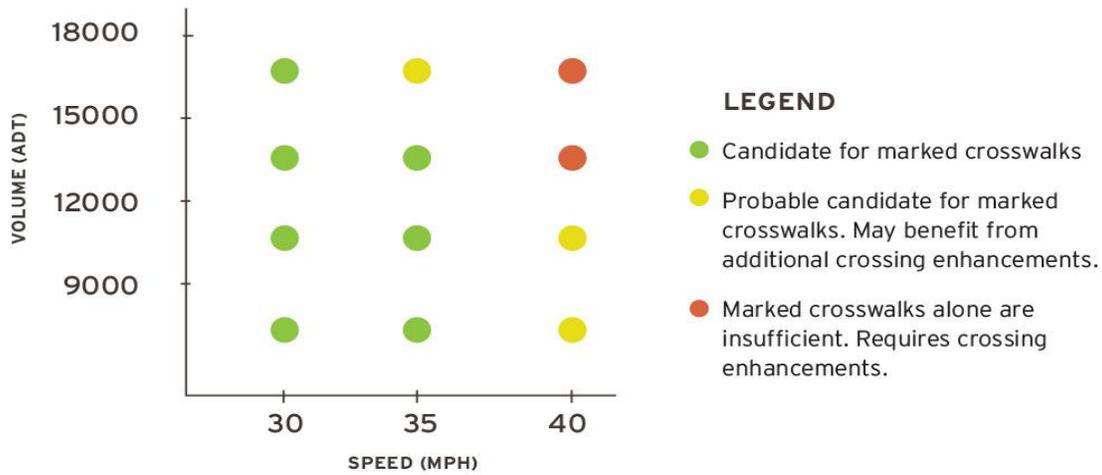


Exhibit 4.5 – Crossing Enhancement Recommendations based on Volume and Speed (image credit: Small Town and Rural Multimodal Networks, FHWA)

For the study corridor, the roadway crossings do not exceed 4,000 AADT. The speeds range from 25 mph to 55 mph. Using this criterion and assessing the context of each crossing, three different options were identified for crossing applications. The application of these crossings is discussed further with each segment discussion.

Option 1, shown in **Exhibit 4.6**, applied high visibility markings across the roadway with bicycle / pedestrian crossing signs, “Yield Here” signage and stop bars, and advanced signage alerting motorists to the trail crossing. It is anticipated this application would be applied at the very low volume crossing locations where speeds were at 45 mph or less.



Exhibit 4.6 – Option 1 Crossing Application (image credit: Small Town and Rural Multimodal Networks, FHWA)

Option 2, shown in **Exhibit 4.7**, applied all of the elements considered in Option 1 and added rapid rectangular flashing beacons to further enhance the crossing and alert motorists to crossing bicyclists and pedestrians. This crossing application would be applied at the higher volume locations where posted speeds were above 45 mph.

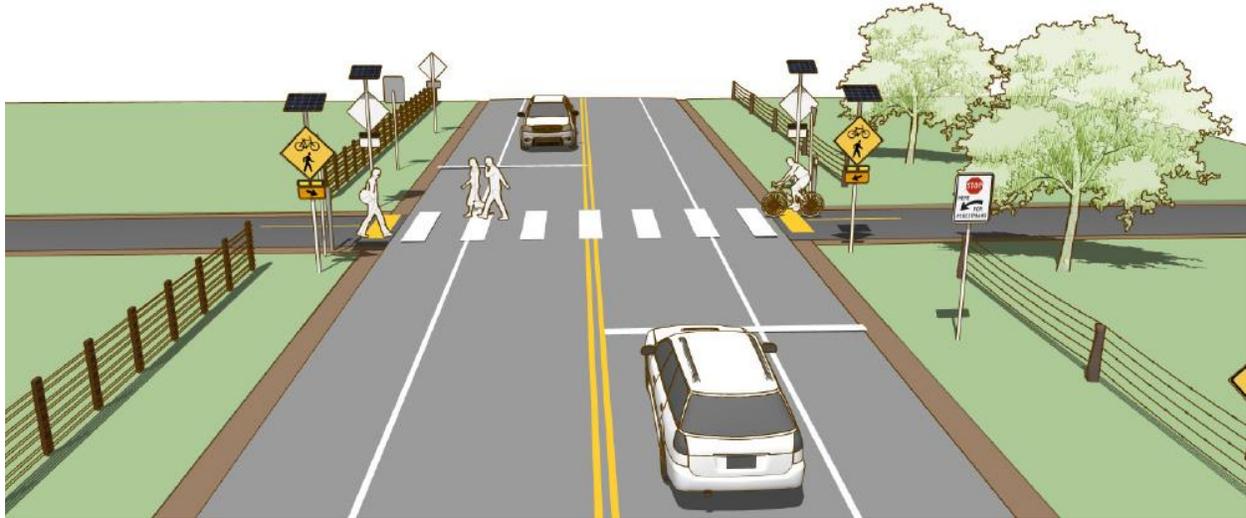


Exhibit 4.7 – Option 2 Crossing Application (image credit: Small Town and Rural Multimodal Networks, FHWA)

Option 3, shown in **Exhibit 4.8**, applied all of the elements of Option 2 and added a median within the roadway to provide pedestrian refuge. This crossing application would be applied at locations where trail user characteristics included higher volumes of children, such as at school zones.

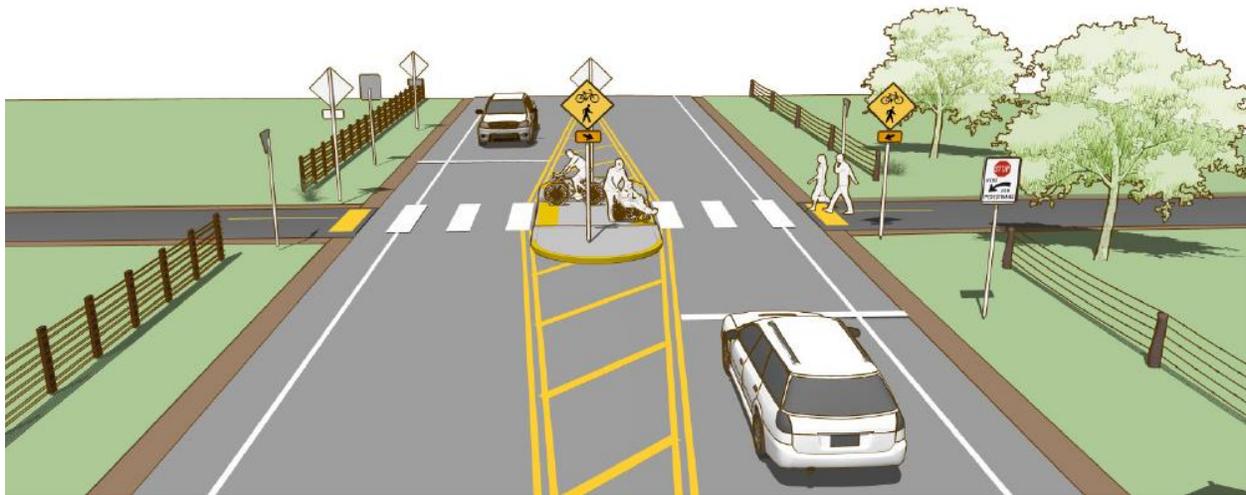


Exhibit 4.8 – Option 3 Crossing Application (image credit: Small Town and Rural Multimodal Networks, FHWA)

A fourth, shown in **Exhibit 4.9**, option was studied that applied the elements from Option 1 and included a pedestrian hybrid beacon. This application would be proposed at multilane roadway crossings with speeds greater than 45 mph. Since the project corridor did not have any multilane roadways, the option was not included in any of the recommendations for the study.

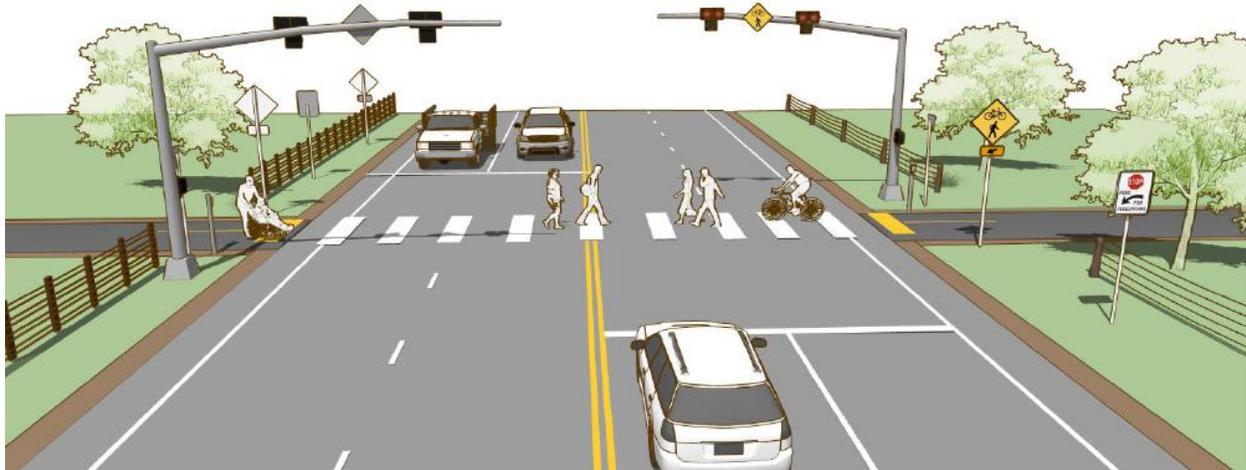


Exhibit 4.9 – Option 4 Crossing Application (image credit: Small Town and Rural Multimodal Networks, FHWA)

Alternatives Discussion

For each segment, an alignment that stayed within the abandoned railroad RW was used as the default option. There were a few locations that had multiple alternatives based on discussion with the Stakeholders, field observations, and identified constraints. Crossing application options were identified for each roadway crossing. Alignment roll plots with the typical section, crossing application, and various alternatives are provided in **Appendix A** of this report.

Segment 1

Beginning at SR 235, the proposed trail was located within the abandoned railroad RW, extending from SR 235 to S High Street. The alignment of the trail within the abandoned railroad RW in this area of the segment does shift slightly north as it approaches the Village of St. Paris to minimize impacts to the existing trees and take advantage of a clear field area. A culvert, identified as Culvert 4 on sheet 5 of 18 in **Appendix A**, is assumed to require minor improvements to accommodate the trail. **Table 4.1** summarizes the roadway crossings and recommended treatment options within Segment 1. The conceptual layouts for Segment 1 can be found on pages 4 through 7 out of 18 in **Appendix A**.

Table 4.1: Segment 1 Roadway Crossings & Treatment Options

Roadway	Roadway Classification	Posted Speed	No. Lanes	AADT (if known)*	Crossing Option
SR 235	Major Collector	55 mph	One lane / direction	3,302	Option 2
S High Street	Local	25 mph	One lane / direction		Option 1
CR 26 / Heck Hill Rd	Local (south of US 36) Minor Collector (north of US 36)	45 mph	One lane / direction	1,015	Option 1

* AADT based on available ODOT TIMS data

At S High Street, as the trail enters the main area of the Village, four alternatives are identified. The goals of the alternatives are to provide access through the Village without impacting any existing buildings constructed within the abandoned railroad RW, facilitate a connection to the Pony Wagon museum, and provide a logical crossing of the active rail line. **Exhibit 4.10** shows where these landmarks and constraints are located within the Village of St. Paris. Where the trail is within public right-of-way in the Village proper, it is anticipated bicyclists will utilize the roadway as a shared roadway or yield roadway and pedestrians will utilize existing sidewalk where present or walk within the roadway.

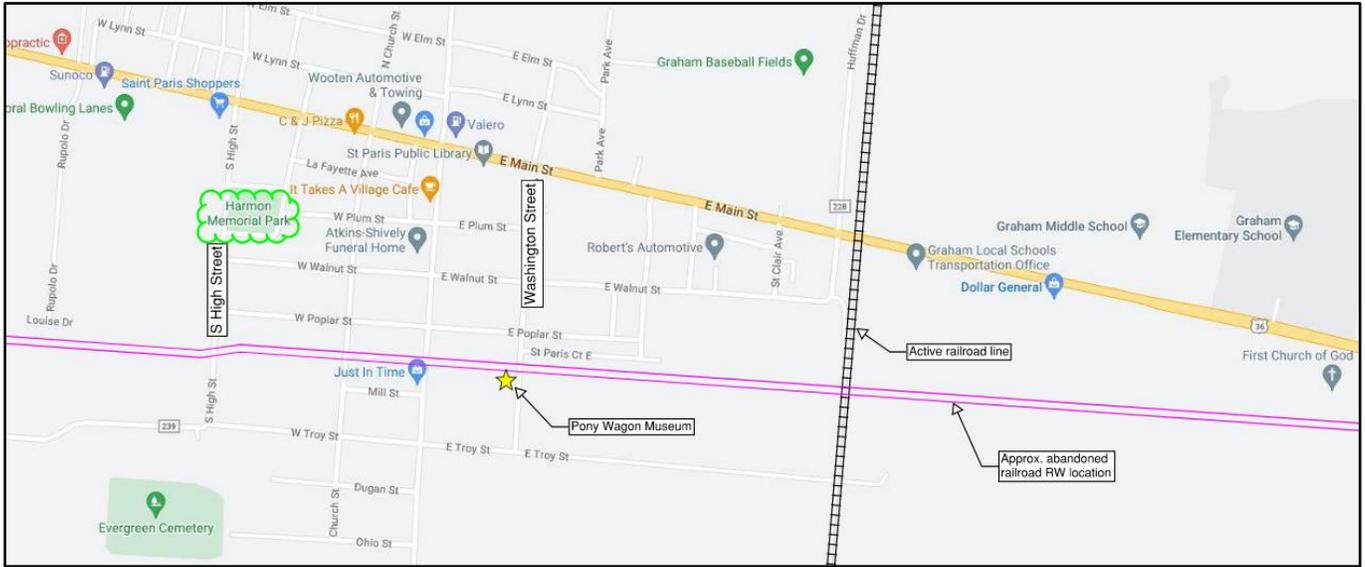


Exhibit 4.10 – Landmarks and Constraints Within the Village of St. Paris Limits

Alternative 1 turns north on S High Street and utilizes existing alleys within the public right-of-way between S High Street and S Springfield Street to avoid buildings within the abandoned railroad RW through this segment. At S Springfield Street, the trail turns to the south to return to the abandoned railroad RW. Staying within the abandoned railroad RW, the trail passes the Pony Wagon Museum, and continues east to the existing grade-separated crossing over the active rail line. Alternative 1 would require construction of a new superstructure over the active rail line, adhering to the vertical clearance requirements for active rail lines. The alternative continues to the east in the abandoned railroad RW until the limits of Segment 1. Alternative 1 is shown in **Exhibit 4.11** as the red line.

Alternative 2 follows the Alternative 1 alignment to S Church Street. At S Church Street, Alternative 2 continues to the south and utilizes a different public right-of-way in an alley south of the manufacturing company between S Church Street and S Springfield Street. The alignment continues to S Springfield Street where it turns to the north and travels along the south side of the Pony Wagon property to Washington Street. At the Pony Wagon Museum, Alternative 2 ties back into the Alternative 1 alignment and continues easterly on the Alternative 1 alignment. Alternative 2 is shown in **Exhibit 4.11** as the blue line.

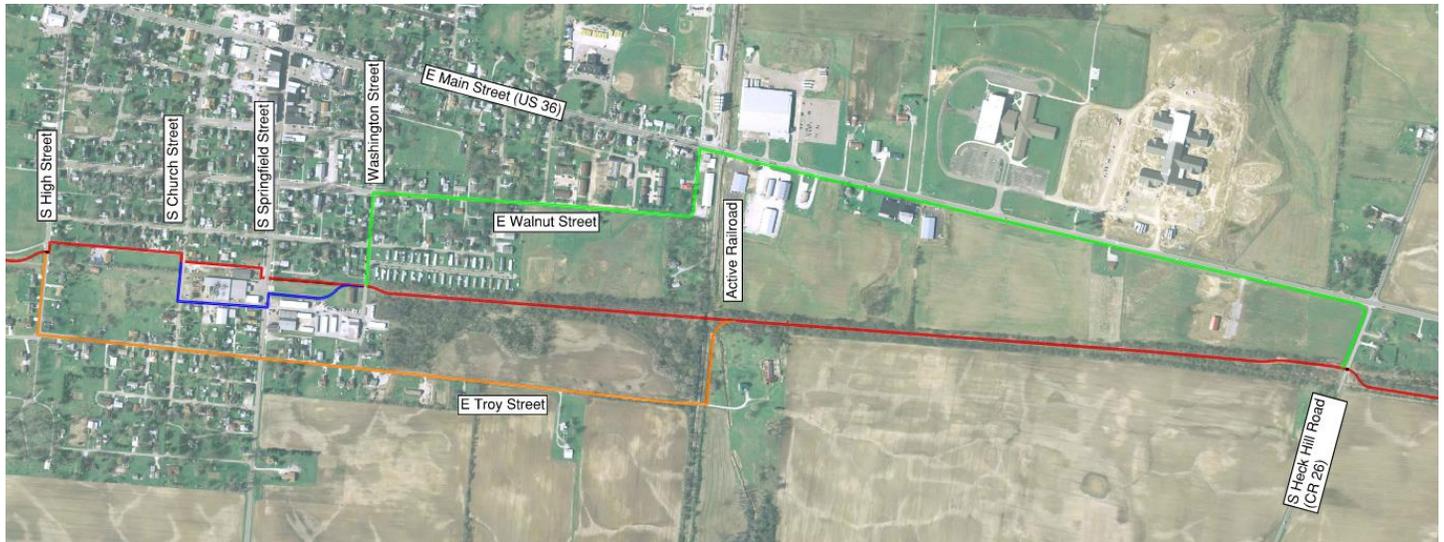


Exhibit 4.11 – Segment 1 Alternative Alignments

Alternative 3 was identified based on stakeholder discussion to take advantage of as much public right-of-way within the Village as possible and to utilize the existing at-grade railroad crossing on Troy Street. Alternative 3 travels south on S High Street and then east on Troy Street. At the end of Troy Street, the path would cross the existing at-grade active rail crossing then turn north on private property to return to the abandoned railroad RW. This alternative would require the at-grade crossing to be upgraded with gates and lights to alert trail users to approaching trains, as well as additional right-of-way acquisition for the property owner at the end of Troy Street. This alternative does not provide a direct connection to the Pony Wagon Museum. Trail blazing signage would be required to direct trail users to the site. Alternative 3 is shown in **Exhibit 4.11** as the orange line.

Alternative 4 can follow the Alternative 1 or Alternative 2 alignment until it reaches Washington Street and the Pony Wagon Museum. From there, Alternative 4 utilizes existing public right of way and the street network within the Village of St. Paris to travel to E Main Street (US 36) where it turns east. At US 36, the trail would transition to a shared use path adjacent to the roadway and utilize the existing at-grade crossing to navigate the active rail line. From the field review, there appears to be enough space for the trail without modification to the existing gates and warning lights, avoiding the need to upgrade the crossing. **Exhibit 4.12** shows this existing at-grade railroad crossing. The trail would continue along the south side of US 36 to CR 26 / Heck Hill Road where it would into the abandoned railroad RW. With the extension of this alternative along US 36, there is a potential to provide access to the Graham Elementary and Middle School campuses. If access is provided to these campuses, additional roadway crossing treatments would be proposed for US 36, following Option 3 with a rapid rectangular flashing beacon and median refuge island. This alternative would be the least costly from an active railroad crossing standpoint. Alternative 4 is shown in **Exhibit 4.11** as the green line.



Exhibit 4.12 – Existing US 36 Railroad Crossing Looking East (photo credit: Google Maps)

Segment 2

Segment 2 remains predominantly centered within the abandoned railroad RW. There are no proposed alternatives within the segment since most of the corridor is adjacent to farm fields. Segment 2 has several existing culverts within the alignment. These culverts can be rehabilitated and reused to provide drainage continuity after construction of the trail, although it is recommended that they be inspected in the consecutive phases of this project to confirm. At the SR 235 crossing, the Conn property immediately north of the trail is relatively close to the abandoned railroad RW. A short section of fencing to provide separation may be desired at this location. **Table 4.2** summarizes the roadway crossings and recommended treatment options within Segment 2. The conceptual layout for Segment 2 can be found on pages 1 through 4 out of 18 in **Appendix A**.

Table 4.2: Segment 2 Roadway Crossings & Treatment Options

Roadway	Roadway Classification	Posted Speed	No. Lanes	AADT (if known)*	Crossing Option
CR 6 / N Bollinger Road	Local	45 mph	One lane / direction	105	Option 1
CR 21 / Elm Tree Road	Local	45 mph	One lane / direction	300	Option 1

* AADT based on available ODOT TIMS data

Segment 3

Within Segment 3, the trail stays predominately within the abandoned railroad RW. Just west of the TR 229 / Fueston Road crossing, the trail does travel directly behind the Bryce Hill Inc. buildings. Within this property, it is recommended that a fence is provided to establish separation between the property buildings and material areas and the trail. Coordination will be necessary with the property owner during acquisition to reestablish an access drive that current travels on the south side of a site building within the abandoned railroad RW area. **Table 4.3** summarizes the roadway crossings and recommended treatment options within Segment 3. The conceptual layout for Segment 3 can be found on pages 7 through 14 out of 18 in **Appendix A**.

Table 4.3: Segment 3 Roadway Crossings & Treatment Options

Roadway	Roadway Classification	Posted Speed	No. Lanes	AADT (if known)*	Crossing Option
TR 229 / Fueston Road	Local	45 mph	One lane / direction		Option 1
Kite Road	Minor Collector	45 mph	One lane / direction	488	Option 1
CR 17 / Runkle Road	Minor Collector	45 mph	One lane / direction	672	Option 1
TR 88 / Troy Hill Road	Local	45 mph	One lane / direction		Option 1
SR 560	Major Collector	55 mph	One lane / direction	2,396	Option 2

* AADT based on available ODOT TIMS data

Approximately 0.34 miles west of the intersection with CR 22 / Kite Road, the proposed trail is south of Graham High School. The stakeholders identified this a key connection to provide access to the school for students traveling from the Village to class. A proposed trail connection is shown in the exhibits in **Appendix A** and in **Exhibit 4.13**. The location and details on this connection will need to be evaluated further during design. The crossing application at this location will follow Option 3, with high visibility markings, signage, a rapid rectangular flashing beacon, and a median refuge island. It is anticipated that many of the crossings will occur during school zone hours, when traffic is legally required to travel at 20 mph. Outside of school zone hours, the rapid rectangular flashing beacon and median refuge will provide additional visibility of the crossing and a traffic calming element to improve crossing safety.

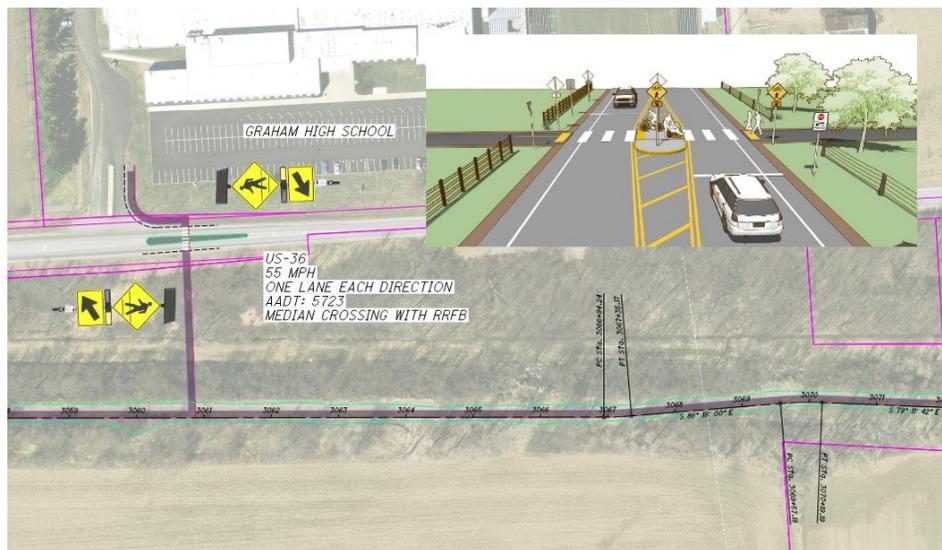


Exhibit 4.13 – Potential Trail Connection to Graham High School

East of the CR 22 / Kite Road crossing, the stakeholders identified a concern about the existing grade of the abandoned railroad ballast, the site visit and available aerial lidar information confirmed that the vertical grade in this area is between 0.75% - 1.8%, with a few areas being slightly flatter or slightly steeper. When evaluating for ADA accessibility, it is required that pedestrian paths that do not follow a roadway grade do not have vertical grades that exceed 5%. If the 5% grade maximum is exceeded, landings with a 2% cross slope and longitudinal slope are required at specific intervals along the grade to provide pedestrians with disabilities a location to rest before continuing up or down the grade. The existing grade within this area of the railroad RW is well within the acceptable continuous grade requirements for trails to meet ADA requirements and not require pull offs to provide resting areas.

West of the CR 17 / Runkle Road crossing, an area of significant erosion was identified by the stakeholders. The erosion occurred due to the collapse of the inlet of an existing culvert. Photos of this area are provided in the existing conditions discussion of this report. In addition to providing an alignment within the abandoned railroad RW, a separate alternative was studied to avoid the erosion and potential significant cost to remediate the culvert and eroded earth. Further geotechnical and other analysis will be required to determine if the eroded area can be avoided or the extent of remediating it.

Alternative 1 maintains an alignment within the abandoned railroad RW. It appears that the existing alignment of the railroad RW is wide enough to permit the trail to pass to the south of the eroded area. It is anticipated that this alignment will require the culvert to be replaced to address the collapsed inlet of the existing culvert and prevent further erosion. With the construction of the new culvert, it is anticipated stabilized embankment will be placed to reconstruct the eroded soil in the washed-out area and prevent further erosion. Further geotechnical investigation will need to be performed to confirm the mitigation needed in this area.

Alternative 2 routes the proposed trail away from the abandoned railroad RW at CR 22 / Kite Road along Kite Road to the south to CR 17 / Runkle Road as a separated path adjacent to the roadway. At Runkle Road, the trail would travel east back to the location where the abandoned railroad RW crosses the roadway and return to the Alternative 1 location. This alternative is approximately 2.5 miles along the county roadway system. See **Exhibit 4.14** below for the Alternative 2 route.

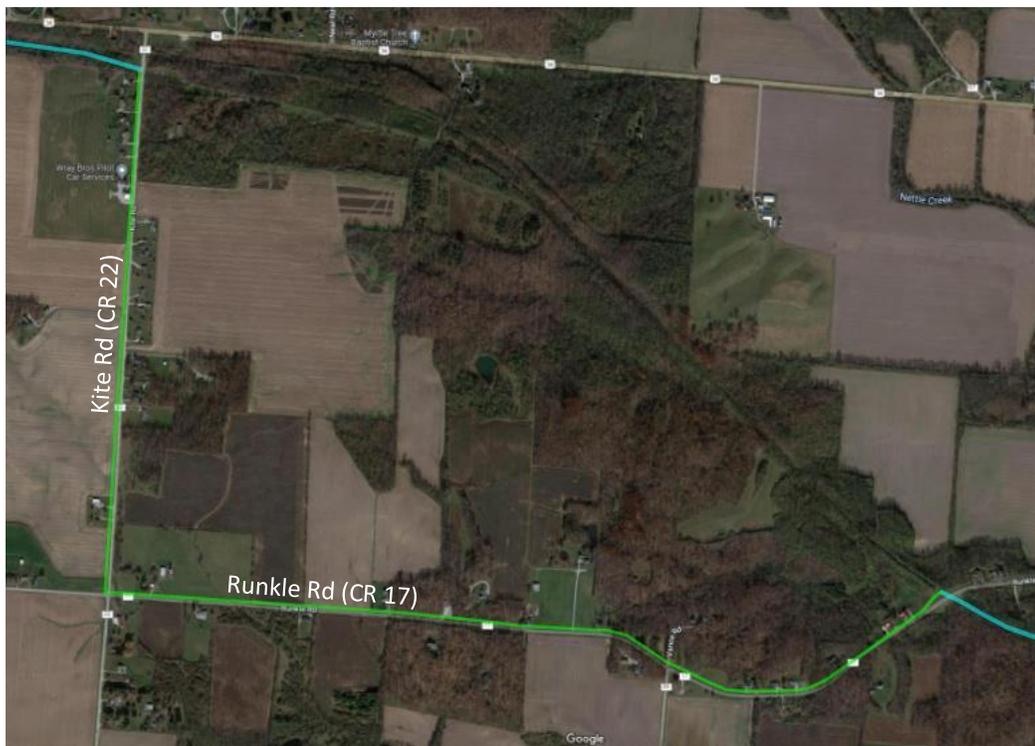


Exhibit 4.14 – Alternative 2 (shown in green) connecting from the abandoned railroad RW at Kite Road (shown in blue) to the abandoned railroad RW at Runkle Road (shown in blue).

At the CR 17 / Runkle Road and TR 88 / Troy Hill Road crossings, the existing fore slopes of existing roadways are relatively steep. To provide a trail crossing that minimizes the length of a maximum 5% vertical grade and avoid the need for landings, the trail is shown sweeping to the north and back to the south as it crosses Runkle Road. At the Runkle Road crossing, the roadway is on a horizontal curve; the horizontal stopping sight distanced is met for drivers to see and stop for trail users. Between TR 88 / Troy Hill Road and SR 560, the alignment crosses an existing culvert, shown on page 13 of 18 in **Appendix A**. The existing culvert appears to be in fair condition and minimal rehabilitation is assumed to be needed with the installation of the path. As the trail approaches the intersection with SR 560, the County materials storage area falls within the abandoned railroad RW. The trail alignment will shift slightly south to avoid the storage areas. A section of fencing may be necessary in this area to provide separation between the trail and the storage area for the trail user’s safety.

Segment 4

The trail in Segment 4 begins at SR 550 and stays within the abandoned railroad RW until just west of the Mad River. Approximately 900 feet west of the TR-89 / Blair Road intersection, an existing outbuilding lies just north of the railroad bed. In this location a short section of fencing may be necessary to provide separation between the trail and the outbuilding, discouraging trespassing. As the trail approaches the TR-89 / Blair Road intersection, coordination of the trail location with the property at this roadway will be necessary. There are two existing bridges over Anderson Creek on the west side of the roadway. The property owner has placed their house on the northern structure and uses the southern structure for their driveway to access the house and the outbuilding 900 feet to the west of the intersection. If the trail alignment follows the railroad bed, the trail would pass over the bridge that the house is placed on. Curving the trail to the south and crossing the southern structure would impact the drive access to the property.

East of the TR-89 / Blair Road intersection, the trail passes over two culverts (Culverts 7 and 8 noted in **Appendix A**) that will likely require minor patching but are otherwise are in fair condition. The trail continues along the abandoned railroad RW for approximately 1 mile past the TR 89 / Blair Road intersection until it reaches the Mad River and the Urbana Materials property line. At this location, the trail divides into three potential alternatives. **Table 4.4** summarizes the roadway crossings and recommended treatment options within Segment 4. The conceptual layouts for Segment 4 can be found on pages 14 through 18 out of 18 in **Appendix A**.

Table 4.4: Segment 4 Roadway Crossings & Treatment Options

Roadway	Roadway Classification	Posted Speed	No. Lanes	AADT (if known)*	Crossing Option
TR 89 / Bair Road	Local	45 mph	One lane / direction		Option 1
Muzzy Road	Local	45 mph	One lane / direction		
S Edgewood Avenue	Major Collector	25 mph	One lane / direction	2,293	

Alternative 1 continues easterly along the railroad bed across an existing structure spanning the Mad River. It is assumed the existing substructure can be reutilized with a new superstructure to carry the trail over the Mad River, but this will need to be confirmed with a formal structural inspection. Once over the Mad River, the trail continues along the existing railroad bed. Within the Urbana Materials property east of the Mad River, the trail will need to be coordinated with existing gravel pit equipment including a conveyor system. The abandoned railroad RW terminates just west of the Muzzy Road crossing, where an active rail line begins that services the gravel company and surrounding businesses. At this location, the proposed trail turns to the south to cross the small drainage channel on a new structure, crosses the quarry access roadway, and continues along the south side of Muzzy Road as a separated shared use path to the South Edgewood Avenue stop-controlled intersection. At this location, the trail crosses South Edgewood Avenue and continues along the south side of Mad River Pike on a shared use path, which has a 25-mph posted speed limit. At the pallet company approximately 1,000 east of South Edgewood Avenue, the trail transitions to an on-road facility due to the narrow width of the existing roadway and overhead railroad bridge. The trail then connects to the Simon Kenton trail via the existing connection off College Way. Alternative 1 is shown in **Exhibit 4.15** as the red line.

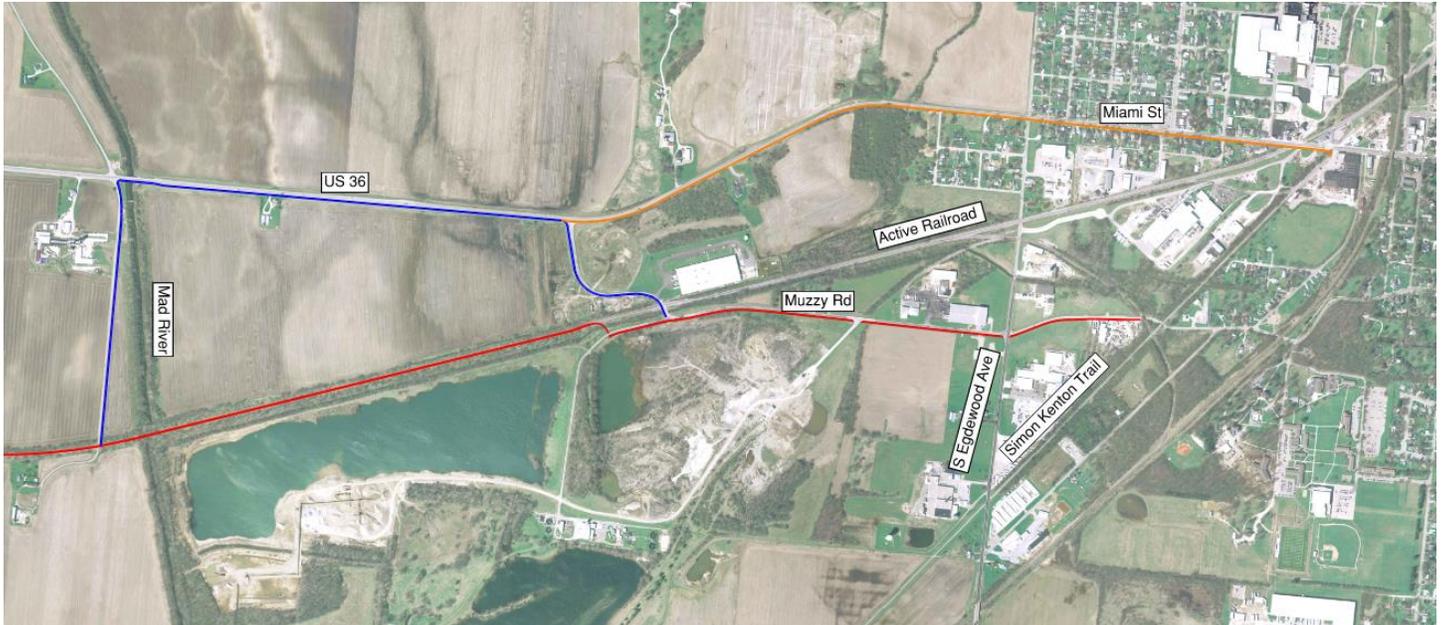


Exhibit 4.15 – Segment 4 Alternative Alignments

Alternative 2 turns north at the Urbana Materials property line on the west side of the Mad River and follows the property line to US 36. At this location the trail turns easterly and continues as a shared use path along the south side of US 36 to the intersection with Muzzy Road. At Muzzy Road, the trail turns to the south and follows Muzzy Road on the west side of the roadway as a shared use path to the crossing of the active rail line, where Alternative 2 meets Alternative 1 and continues along Muzzy Road to the Simon Kenton tie in point. This alternative would require modifications to the US 36 structure over the Mad River and the Muzzy Road crossing over the small drainage channel by the active rail line. At US 36 and at Muzzy Road, it is anticipated the structures will require minor widening to accommodate a barrier separated shared use path on the south side (US 36) or (west side) (Muzzy Road) of the structure. The alternative does cross an active rail line on Muzzy Road, adjacent to the Urbana Materials property. This crossing currently does not provide gates or lights, likely due to the line being located at adjacent to the termination point of the active rail line. It is anticipated that trains crossing Muzzy Road at this location are traveling very slowly and trail users will not need additional warning devices other than signage to safely navigate this crossing. Alternative 2 is shown in **Exhibit 4.15** as the blue line.

Alternative 3 follows the Alternative 2 alignment along the Urbana Materials property line and US 36 as a shared use path. Where Alternative 2 turns to the south to follow Muzzy Road, Alternative 3 continues along the southern side of US 36 into Urbana. From the intersection of US 36 and Muzzy Road / N Edgewood Avenue, the trail continues as a shared use path along the south side of US 36 for approximately 0.5 miles, crossing an active rail line and intersecting with the Simon Kenton Trail. At the active rail line, coordination will be necessary to provide a safe crossing for the trail users, potentially requiring the installation of crossing gates and lights at the trail crossing. The installation of the shared use path along US 36 within Urbana may require the removal of mature trees to accommodate the path. It is possible that an on-street alternative, such as a cycle track, could be studied within this reach of the trail; an on-street option that does not share a travel lane with vehicles would require elimination of parking. If an on-street option was utilized, pedestrians could walk along existing sidewalk to continue on the trail to the Simon Kenton Trail. Alternative 3 is shown in **Exhibit 4.15** as the orange line.

Section 5.0: Evaluation of Segments and Alternatives

Evaluation Criteria

The various alternatives discussed in Section 4 were reviewed and evaluated based on the following criteria.

- Safety at roadway
- Safety at active rail grade crossings
- Reuse of existing structures
- Right-of-Way
- Comfort for trail users
- Connection to key locations
- Construction cost

Safety at roadway crossings

Within all of the segments, roadway crossing applications were identified to optimize safety for the trail users. Since all alternatives addressed this criterion, it is not a differentiating factor and was not included in the individual discussions below.

Safety at active rail crossings

The safety at active rail grade crossings applies to Segment 1 and Segment 4. This criterion considers the separation of the trail user from the railroad (at-grade or grade separated) and the existence of at-grade warning devices (lights, gates, signage).

Reuse of existing structures

The reuse of existing structures considers the ability of an alternative to utilize an existing structure, whether a culvert or a bridge. The consideration includes the need to rehabilitate or build structural elements and coordination needs (such as with railroad owners). Assumptions were made for the purpose of this study based on what was evident from the field and drone photos. Additional inspections will be required to confirm the condition of these structures when a final alignment is selected.

Right-of-way

Since right-of-way is necessary for the extents of the abandoned railroad RW, evaluation of the alternatives within this specific area was not considered in this criterion unless the proposed alternative directly impacted an existing residential or commercial structure. This criterion also identified potential acquisition needs, impacts, and potential challenges for areas outside of the abandoned railroad footprint.

Comfort for trail users

The comfort of trail users considers the surrounding context of the trail location. This could include proximity to high speed roadways, amount of tree cover, grade of the trail, and overall sense of security.

Connection to key locations

Connection to key locations considers the ability of the trail to provide access to those locations identified by the stakeholder group. These locations include the Pony Wagon Museum, Harmon Memorial Park, Graham High School, and the Simon Kenton Trail.

Construction costs

Costs were estimated for major items such as the path pavement and street resurfacing, structure and culvert replacement or repair, excavation and embankment, street crossing applications, and bike railing. Mobilization costs were captured for each alternative and segment. To account for additional items that would be necessary for the trail construction, a 30% contingency was applied to the subtotal of the construction estimate. Construction dollars were calculated in 2021 dollars based on current ODOT bid tabulations and other relevant data associated with the trail construction elements, and inflated to a 2025 cost, assuming an 18% inflation factor based on ODOT's inflation calculator spreadsheet.

Segment 1

The evaluation criteria listed above was used to assess the four alternatives identified within the Village of St Paris. **Figure 5.1** shows the evaluation matrix for the alternatives within Segment 1.

Comparison Measure	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Safety at active rail grade crossings				
Reuse of existing structures			N/A	N/A
Right-of-Way				
Comfort for trail users				
Connection to key locations				
Construction Cost				

Symbol Key

Best
 Good
 Acceptable
 Poor
 Very Poor

Figure 5.1: Segment 1 Alternatives Evaluation Matrix

Safety at active rail grade crossings – Alternatives 1 and 2 provide the highest level of safety for trail users by providing a grade separated crossing at the active rail line. Alternative 4 provides the second highest level of safety for trail users by utilizing the existing US 36 at-grade crossing that already has gates and lights installed. Alternative 3 provides the lowest level of safety for trail users at the existing at-grade crossing on Troy Street. This crossing currently does not have lights or a gate to warn trail users of oncoming trains and would require coordination with the railroad company to install the gates and lights.

Reuse of existing structures – Alternatives 1 and 2 are the only alternatives that reuse the existing abutments for the former grade separated crossing at the active rail line. While it is advantageous to reuse the existing abutments, a new superstructure is necessary. The coordination of this superstructure with the railroad could be complex and time consuming. There is a possibility that the railroad owner could deny the reconstruction of a grade separated crossing since the superstructure was removed. This is a coordination point that would need to be confirmed at a later date as the study progresses. Considering the complex coordination and the potential for the railroad owner to deny the crossing, the alternatives are considered acceptable.

Right-of-way – Alternative 1 uses public right-of-way until the alternative comes back to the abandoned railroad RW at S Springfield Street. At this location, acquisition of right-of-way along the Pony Wagon Museum property will be necessary to construct the trail. Based on stakeholder discussion, acquisition of right-of-way adjacent to the Pony Wagon Museum should not be complex, scoring Alternative 1 as a good alternative. Alternative 2 utilizes public right-of-way to Washington Street, then requires acquisition along the Pony Wagon Museum property and scores similarly to Alternative 1. Alternative 4 utilizes this same path as Alternative 1 to Washington Street. Once on Washington Street, Alternative 4 takes advantage of public right-of-way along Washington Street, Walnut Street, Ashland Avenue, and US 36 to move trail users across the active rail line. As Alternative 4 travels along US 36, there may be a

need for a small amount right-of-way acquisition to accommodate the trail, or an easement to accommodate grading. Similarly, along CR 26 / Heck Hill Road, Alternative 4 may need a small amount of right-of-way or easement to connect with the abandoned railroad RW. The right-of-way acquisition for Alternative 4 is anticipated to be minor, scoring Alternative 4 as a good alternative. Alternative 3 utilizes public right-of-way for most of the alternative alignment along Village streets and Troy Street. Right-of-way acquisition will be necessary from the Bollinger property on the east side of the active rail line. It is unknown if this acquisition could be challenging. Given this, Alternative 3 is acceptable for right-of-way impacts.

Comfort of Trail Users – Within the Village, all four alternatives utilize some portions of existing public right-of-way on public streets or alleys. The streets within St Paris are all low speed and low volume. Several have existing sidewalk for pedestrians on the trail to utilize. The streets within the Village are relatively shaded with mature street trees. While a shared street may not be as ideal as a separated trail, the Village streets are well suited for a shared street scenario and do provide trail users with a higher level of comfort.

Alternatives 1 and 2 will score the highest in this category since both alternatives return to the densely wooded abandoned railroad RW immediately east of Washington Street. This maximizes trail user comfort and provides a scenic trail. As Alternative 3 travels east of Washington Street on Troy Street, the roadway does become more open with less tree coverage. The traffic volume should decrease significantly since Troy Street serves the single residential property east of town. Once past the active rail line crossing, Alternative 3 returns to abandoned railroad RW. Alternative 3 would score as good for comfort level. Alternative 4 has a high level of comfort when within the Village streets. However, this level of comfort decreases as the trail turns to the east and travels adjacent to US 36. While the design criteria for trails adjacent to roadways is applied, the high-speed nature and open terrain along US 36 could make this portion of the trail less desirable from a comfort standpoint for trail users. Given this, Alternative 4 would be acceptable from a comfort standpoint.

Connection to Key Places – All of the alternatives proposed within the Village do not provide direct access to Harmon Memorial Park. However, it is anticipated that trail blazing sign can be placed on S High Street to direct trail users to the park. Alternatives 1, 2, and 4 provide direct access to the Pony Wagon Museum. Alternative 3 does not provide direct access to the museum and would require additional trail blazing signage. Alternative 4 provides an additional advantage with the opportunity to provide an additional crossing to the Graham Elementary School or Middle School and provide access to those campuses for students. While the elementary and middle schools were not identified as key locations, this potential connection does differentiate Alternative 4 as a better alternative compared to Alternatives 1 and 2. Alternative 3 scores the lowest in this category due to the lack of direct access.

Construction Costs – Construction costs are summarized in **Table 5.1** below for Segment 1 and the various alternatives.

Table 5.1 – Segment 1 Construction Costs

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Roadway (pavement, rail / fence)	\$676,000	\$686,000	\$696,000	\$680,000
Embankment / Excavation	\$343,000	\$350,000	\$254,00	\$310,000
Traffic Control	\$13,000	\$13,000	\$13,000	\$13,000
Culvert Repair	\$0	\$0	\$0	\$0
Structures	\$420,000	\$420,000	\$0	\$0
Mobilization	\$114,000	\$114,000	\$114,000	\$114,000
30% Contingency	\$471,000	\$475,000	\$322,000	\$335,000
2021 Costs	\$2,037,000	\$2,058,000	\$1,399,000	\$1,452,000
2025 Costs (18% Inflation)	\$2,405,000	\$2,430,000	\$1,652,000	\$1,715,000

Segment 2

Segment 2 did not encompass any alternatives. There were no active rail line crossings within Segment 2, negating this from the evaluation criteria. It is assumed the existing culverts within this section can predominately be reused with some minor work. Overall, Segment 2 stays within the abandoned railroad RW and does not require additional RW purchase outside of the abandoned railroad footprint. The trail stays within the abandoned railroad RW which is predominately tree covered through this segment. There are no key locations within the corridor. The estimated construction cost is summarized in **Table 5.2** below.

Table 5.2 – Segment 2 Construction Costs

Segment 2	
Roadway (pavement, rail / fence)	\$394,000
Embankment / Excavation	\$318,000
Traffic Control	\$46,000
Culvert Repair	\$0
Structures	\$0
Mobilization	\$20,000
30% Contingency	\$234,000
2021 Costs	\$1,102,000
2025 Costs (18% Inflation)	\$1,195,000

Segment 3

In general, no portion of Segment 3 crossed an active rail line and other than a connection to Graham High School, the alternatives did not provide any connections to key locations. These criteria were not used in any evaluation of alternatives. The other evaluation criteria were used to assess the two alternatives identified at the site where significant erosion has occurred. **Figure 5.2** shows the evaluation matrix for the alternatives within Segment 3.

Comparison Measure	Alternative 1	Alternative 2
Safety at active rail grade crossings	N/A	N/A
Reuse of existing structures		
Right-of-Way		
Comfort for trail users		
Connection to key locations	N/A	N/A
Construction Cost		



Figure 5.2: Segment 3 Alternatives Evaluation Matrix

Reuse of existing structures – Alternative 1 is located to avoid the eroded area and culvert while remaining within the abandoned railroad RW corridor. The alternative does propose replacing the damaged culvert and repairing the erosion to avoid further degradation of the area. While this work is more costly than avoiding the area and any repairs, it does address a concern for the stakeholders and prevents further erosion. Alternative 2 routes trail users outside of the abandoned railroad corridor and avoid this area. While this alternative avoids additional costs associated with the culvert replacement and embankment repair, no remediation of the current conditions is provided. Without remediation, the eroded conditions will likely continue to worsen. These considerations resulted in Alternative 1 ranking as the best and Alternatives 2 ranking as very poor.

Right-of-way – Alternative 1 ranked the best since the trail stays within the abandoned railroad RW corridor. Alternative 2 follows existing public roadways. The existing right-of-way adjacent to these roadways is typically 60’ wide, with approximately 20’ of available

space from the edge of the paved shoulder to the right-of-way. The proposed trail adjacent to the roadways will likely fit within the existing right-of-way. It is possible that minimal grading easements or small strip takes for a proposed drainage swale may be needed. Since these right-of-way needs would be small, this alternative ranked as good.

Comfort of Trail Users – With Alternative 1 staying along the abandoned railroad RW corridor, trail users will stay within a heavily wooded area, providing a scenic ride and shade and shelter from the elements. Alternative 2 follows existing roadways that have no shade or shelter from the elements and general provides views that are less scenic than the abandoned railroad RW. Additionally, the length of Alternative 2 is significantly longer than Alternative 1. This results in a best rating for Alternative 1 and a poor rating for Alternative 2.

Construction Costs – Construction costs for the Segment 3 alternatives are summarized in **Table 5.3**.

Table 5.3 – Segment 3 Construction Costs

	Alternative 1	Alternative 2
Roadway (pavement, rail / fence)	\$1,903,000	\$2,020,000
Embankment / Excavation	\$705,000	\$798,000
Traffic Control	\$67,000	\$67,000
Culvert Repair	\$467,000	\$467,000
Structures	\$960,000	\$1,320,000
Mobilization	\$100,000	\$100,000
30% Contingency	\$1,262,000	\$1,433,000
2021 Costs	\$5,464,000	\$6,205,000
2025 Costs (18% Inflation)	\$6,448,000	\$7,323,000

Segment 4

Segment 4 identified three alternatives at the Urbana Materials property. These alternatives were evaluated using all six criteria identified as key items. **Figure 5.3** shows the evaluation matrix for the alternatives within Segment 4.

Comparison Measure	Alternative 1	Alternative 2	Alternative 3
Safety at active rail grade crossings			
Reuse of existing structures			
Right-of-Way			
Comfort for trail users			
Connection to key locations			
Construction Cost			

Symbol Key

Best
 Good
 Acceptable
 Poor
 Very Poor

Figure 5.3: Segment 4 Alternatives Evaluation Matrix

Safety at Active Rail Grade Crossings – Alternative 1 does not require an active rail line crossing and rates as best out of the alternatives. Alternative 2 requires an at grade crossing at Muzzy Road. The crossing is located adjacent to the termination of the active line and it is anticipated that trains are traveling slowly, and trail users can safely navigate the crossing. This alternative was ranked as good. Alternative 3 crosses the active rail line just west of the tie into the Simon Kenton Trail. The location of the shared use path at this location places trail users behind the existing gates and lights for vehicles. This will require the installation of gates and lights specifically for the trail to provide warning and gating controls for trail users. This alternative ranked lowest as acceptable after the installation of gates and lights.

Reuse of existing structures – All 3 alternatives require the use of existing structures to complete the connections Segment 4 is achieving. Alternative 1 utilizes the existing railroad Mad River crossing and requires a new superstructure to cross the river. Alternatives 2 and 3 can repurpose the existing bridge deck of the US 36 structure over Mad River with minor modifications to install a barrier separated shared use path. Alternative 2 also requires widening of an existing structure over the drainage ditch along the active rail line. Based on these needs, Alternative 1 scored the lowest, Alternative 2 second lowest, and Alternative 3 the highest based on impacts and size of improvements.

Right-of-way – Alternative 1 requires acquisition of property from Urbana Materials adjacent to the gravel pits and Muzzy Road where existing gravel equipment is located. While this is part of the abandoned railroad RW, the utilization of the property by the quarry may make acquisition challenging. Alternatives 2 and 3 require some acquisition from the Urbana Materials outside of the abandoned railroad RW to provide a connection that does not go through the company’s property near Muzzy Road where existing gravel equipment is located. Outside of the Urbana Materials, all three alternatives utilize existing roadway right-of-way for the trail or shared use path. Minor strip takes may be required to accommodate the path or to provide ditch drainage in some locations. With the potential challenges within the Urbana Materials property, Alternative 1 ranks the lowest of the three alternatives. Alternatives 2 and 3 are comparable and rank the same.

Comfort of Trail Users – Alternative 1 maintains an alignment along the abandoned railroad RW and then follows a low speed roadway to the Simon Kenton Trail tie in. This alignment is the most direct and likely the most comfortable for trail users. Alternatives 2 and 3 are more circuitous and require trail users to follow portions of US 36, which is high speed (55 mph) within a portion of the proposed alternative alignment. With the higher truck volume on Muzzy Road, as observed by stakeholders, Alternative 2 is likely less comfortable than Alternative 3 along portions of the alignment.

Connection to Key Places – All three alternatives provide a connection to the Simon Kenton trail. An additional advantage to Alternative 3 is a connection to multiple businesses in Urbana along US 36, such as the Farmer’s Daughter, Pappy’s, Crabills Hamburger Shoppe, and Depot Coffee House. The additional connections to local businesses rank Alternative 3 higher than Alternatives 1 and 2.

Construction Costs – Construction costs are summarized in Table 5.4 below for Segment 4 and the various alternatives.

	Alternative 1	Alternative 2	Alternative 3
Roadway (pavement, rail / fence)	\$588,000	\$667,000	\$713,000
Embankment / Excavation	\$475,000	\$475,000	\$475,000
Traffic Control	\$19,000	\$19,000	\$19,000
Culvert Repair	\$59,000	\$59,000	\$59,000
Structures	\$2,190,000	\$690,000	\$892,000
Mobilization	\$120,000	\$120,000	\$120,000
30% Contingency	\$1,036,000	\$609,000	\$684,000
2021 Costs	\$4,487,000	\$2,639,000	\$2,962,000
2025 Costs (18% Inflation)	\$5,296,000	\$2,840,000	\$3,189,000

Table 5.4 – Segment 4 Construction Costs

Rankings Summary

Feasible alignments which could be advanced to further preliminary engineering evaluation include:

- **Segment 1** – Alternatives 1, 2, and 4. The stakeholders identified these three alternatives as preferred alternatives. Alternatives 1 and 2 were the most desirable due to the grade separated crossing. Alternative 4 was the second preferred option due to the use of the at grade crossing on US 36 with the existing gates and lights.
- **Segment 3** – Alternative 1. This alternative utilizes the abandoned railroad RW through the entire corridor. While the area with significant erosion is adjacent to the trail, the alternative proposes repairing the erosion and replacing the damaged culvert, creating a better situation at this location than is currently provided.
- **Segment 4** – Alternatives 2 and 3. Alternatives 2 and 3 provide the best ratings and lower costs of the three alternatives and will likely have less right-of-way acquisition challenges than Alternative 1.

Section 6.0: Environmental Considerations

As a 14-mile corridor, it is anticipated the project will be constructed in phases, potentially with disparate funding sources. Care must be taken in phasing the project, to ensure that the individual phases have logical termini, independent utility, and do not preclude consideration of additional alternatives for future phases.

The following is a summary of environmental resources within the project area and anticipated involvement with those resources. Of the Alternatives, any segments and alternatives following the abandoned railroad corridor will have the greatest impact on environmental resources. The no build alternative and on-road options will have no to minimal impacts.

Streams and Wetlands: The No Build and on-road alternatives will have no impact on streams or wetlands.

There are multiple stream crossings within segments and alternatives following the abandoned railroad corridor. Additionally, streams and railroad ditches parallel the former rail line. Under the segments and alternatives following the abandoned railroad corridor, the corridor will need to be evaluated to identify impacts to regulated waterways/wetlands and jurisdictional ditches.

Excluding the far east end of the corridor, the entire segments and alternatives following the abandoned railroad corridor is located within areas that are ineligible and potentially eligible for the 401 Water Quality Certification. As a linear transportation project, it should be assumed that impacts to waterways will require an individual 401 permit or Director's Authorization, with stream mitigation.

The project is not located within 1000 feet of a designated wild or scenic river.

Floodplain: The No Build Alternative and on-road alternatives are likely to be exempt from floodplain permitting. If the project is funded with federal funds, compliance with Executive Order 11988 must be documented for all build alternatives.

The segments and alternatives following the abandoned railroad corridor extends through the designated special flood hazard areas associated with Nettle Creek, Anderson Creek, the Mad River, and Dugan Run. Portions of the corridor cross the designated floodways of Anderson Creek, the Mad River, and Dugan Run. The project must be designed to comply with the National Flood Insurance Program, including documenting no net rise in the base flood elevation within the floodways.

Threatened and Endangered Species: The No Build Alternative and on-road alternatives are expected to be exempt from ecological survey requirements, as these alternatives will not include instream work, tree removal or more than minor earth-disturbing activities. The exception will be those areas where the trail transitions to a shared use path adjacent to a roadway with vegetation, especially trees, within the corridor, or are crossing or adjacent to roadside ditches, streams, or channels.

The segments and alternatives following the abandoned railroad corridor will include instream work, tree removals and earth-disturbing activities. An ecological survey report will be required for these alternatives.

Champaign County is within the known habitat ranges of the Indiana and northern long-eared bats, the bald eagle, and the eastern massasauga rattlesnake.

- The segments and alternatives following the abandoned railroad corridor are not located within established buffers for Indiana or northern long-eared bats. The segments and alternatives following the abandoned railroad corridor will be subject to cutting restriction dates.
- The segments and alternatives following the abandoned railroad corridor is not within one-half mile of a known bald eagle nest. The segments and alternatives following the abandoned railroad corridor is not within an established buffer for the eastern massasauga; a buffer is present south of the eastern portion of the corridor. If the project will impact wetlands or areas upland of wetland areas, additional consideration for impacts to and protection of the eastern massasauga will be needed.

The ODNR Natural Heritage Database was reviewed, for records of protected species in proximity to the segments and alternatives following the abandoned railroad corridor. There is a record for prairie dropseed (state-listed endangered) between US 36 and the rail line. There are multiple records for the tongue-tied minnow (state-listed threatened) within the Mad River and tributaries of the Mad River. Additional evaluation for this species will be needed as part of the ecological survey report.

Cultural Resources: The No Build Alternative and on-road alternatives are work types that have minimal potential to cause effects to historic properties.

Along the segments and alternatives following the abandoned railroad corridor, there are no National Historic Landmarks or sites that have been determined eligible for the National Register of Historic Places. Ohio Historic Inventory Forms have been completed for the railroad (CHP0099310) and for the railroad tower located near the east end of the corridor near Urbana (CHP0099410).

Ohio Historic Inventory forms have also been completed for many properties within St. Paris. Ohio Archaeological Inventory forms have been complete for several sites along the Mad River, in proximity to the corridor.

Under the segments and alternatives following the abandoned railroad corridor, additional efforts to identify and consider impacts to historic/archaeological resources will be needed if right-of-way will be required from properties. In particular, any railroad bridges or stone culverts that will be impacted by construction (replace or rehabilitated) will require further evaluation, as the rail line dates to circa 1853 and the bridges and culverts on the line have not been previously inventoried.

Recreational Section 4(f)/6(f) Resources: The No Build Alternative and on-road alternatives will not directly impact or restrict access to any publicly owned recreational resources.

The Mad River Water Trail extends under the segments and alternatives following the abandoned railroad corridor. If construction activities will restrict access to the water trail, Section 4(f) coordination will be required, including consideration for provision of portage within the immediate project area.

There are no evident parks funded with Land & Water Conservation Funds (Section 6(f) resources) adjacent to any of the build alternatives.

Air Quality: As a bike/ped facility, all build alternatives are expected to be exempt from analysis for mobile source air toxics. The project is not located in an area that is currently in non-attainment for criteria air pollutants under the National Ambient Air Quality Standards.

Noise Levels: The project is not a Type I project for noise. That is, it does not add motor vehicle capacity, is not a new highway on new location, does not significantly change the horizontal or vertical alignment of a roadway, or add an auxiliary lane. Therefore, a noise analysis is not required under any build alternative.

Drinking Water Resources: The project is partially located within the boundaries of a designated sole source aquifer. The project is also located within the source water protection areas of the St. Paris water supply. Under all build alternatives, a plan note to protect groundwater resources will be included in the project plans.

Farmland: If right-of-way will be required, consideration under the Farmland Protection Policy Act will be required if federal funds are utilized. If the project is funded with federal transportation funds, the project will likely meet the Farmland Memorandum of

Understanding. Additionally, acquisition under this project is unlikely to exceed the coordination thresholds of ORC 929.05 (10 acres from an individual property).

Regulated Materials: Multiple properties of concern are located adjacent to the corridor, including the following:

- Sohioagro Service Co at 7436 N. Bollinger Road, DERR 555000748
- Urbana Mad River Wellfield, DERR 511001440
- Johnson Welded Products at 625 S. Edgwood Avenue, CERCLA Non-NPL OHN000508148

Additional investigation may be warranted if the selected alternative's footprint requires additional involvement with identified properties of concern.

Underserved Populations: The project corridor is 14 miles in length and mostly extends through undeveloped/agricultural land with widely separated residential housing. Near St. Paris, the project will include work adjacent to denser housing/commercial development.

The project will not require relocations. Under all build alternatives, right-of-way acquisition, if any, will be minimal. Under all build alternatives, the project will improve bicycle access for local residents and visitors. The segments and alternatives following the abandoned railroad corridor, which will provide a multi-use trail facility, will also improve pedestrian access. Under the build alternatives, the project is not expected to result in disproportionate adverse impacts to underserved populations. Consideration for ensuring existing pedestrian access is maintained will be necessary for work in areas with existing pedestrian facilities and/or known pedestrian use.

Public Involvement: If the project is funded with federal transportation funds, public involvement will be undertaken and public input will be considered, prior to advancing a build alternative to detailed design, consistent with ODOT's public involvement guidance.

Section 7.0: Recommended Next Steps

The Village of St. Paris is pursuing funding opportunities to move Segment 1 into the next stages of the project development process, along with planning to move the other phases forward, potentially through partnerships with other agencies. The recommended next step is to initiate a detailed preliminary engineering study of Segment 1 to verify the feasibility of the alignment and alternatives. Specific items that are recommended to be performed during the next phases of this project include the following.

- Field verify the potential environmental issues to determine mitigation strategies, and complete and ecological survey report (ESR)
- Further refine conceptual layouts for the chosen alternative to obtain better estimates for construction and right of way costs
- Perform structural inspections of the existing culverts and bridges to confirm the assumptions made in this study
- Perform geotechnical work to determine soil and slope stability
- Investigate conceptual best management practices (BMP's) that will be required for the project
- Depending on funding source, engage public and other stakeholders
- Obtain detailed field survey to be used in detailed design once final alignment is established

As funding for other segments is identified, further studies of those segments are recommended to finalize the alignment and preferred alternative.