Preston Nonmotorized Connectivity

Given to Teresa Weinschenk with the City of Preston, Iowa
& David Heiar with the Jackson County Economic Alliance
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Image Source: City of Preston

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Executive Summary

The community of Preston sought assistance from the Iowa Initiative for Sustainable Communities and the University of Iowa College of Engineering to design a better connected non-motorized transportation system for the City of Preston, IA. The community feels it needs to develop a safer and easier method of connectivity throughout the city for the use of all ages.

In collaboration with Preston community representatives, Civil & Environmental Engineering students identified 5 areas of focus: a side path along Highway 64, safe crossings of Highway 64 on Main Street and Mitchell Street, pedestrian facilities along School Street, a new sidewalk in the southwest subdivision, and a trail extension from Copper Creek trailhead south to the local park on West Street. For each focus area, a cost estimate is provided which includes all material purchase, labor, equipment, overhead, profit, contingency, engineering, and administration costs. A breakout of construction costs by item is provided in Appendix B.

Priority one for the community is improvement of the sidewalks along School Street. The community has requested placing sidewalk along the South edge. The Project Team designed three alternatives for the city that can be used separately or in combination to maximize mobility. Alternative 1 is sidewalks installed along the north side of School Street, alternative 2 is sidewalks installed along the south side of School Street, and alternative 3 involves converting the existing parking lane on the south side of School Street into a painted buffer pedestrian lane with the option for a community-engaged mural. The sidewalk design is 5’ wide, roughly 2,200 linear feet long, and paved with 4” deep concrete. The overall cost of alternative 1 is estimated at $18,000, the cost of alternative 2 is estimated at $130,500, and the cost of alternative 3 is estimated at $151,000. The recommended alternative is alternative 1 involving the pedestrian

lane, chosen for its low cost and emphasis on the community engagement with Easton Valley Junior/High School. Details about this design area can be found on drawing sheets 9-20 and Figures 7, 10, 11, 12 and 13.

The second priority is centered around Highway 64, the arterial road that bisects the community. Highway 64, the major highway dividing Preston into north and south, poses a challenge for crossing pedestrians at the intersections with Main Street and Mitchell Street. Accessibility of the crossings is a concern, and if any improvements are made to the intersections, curb ramp orientation, materials, and grades should be changed to meet ADA requirements. The curb ramp slope used at each crossing was the maximum 8.3%. The overall cost of this priority is estimated at $28,800. This design area can be found on drawing sheet 7 as well as Figures 5 and 6.

The third priority area relates to connectivity of Cooper Creek trail, a local trail, to the residential community. Preston would like to extend this trail to a recently new walkway path that goes around a baseball park near West Street. Four alternatives were developed for the city to consider in their plans. Alternative 1 runs along Industrial Lane and crosses Highway 64 at West Street. Alternative 3 uses existing sidewalk along Mitchell Street and a utility ROW parallel to Grant Street. Alternative 2 uses existing sidewalk along Mitchell Street, then runs along Highway 64 west to West Street. Alternative 4 uses existing sidewalk along Mitchell Street, then along Degroat Street to cross West Street. The recommended alternative is alternative 4, due to its low cost and prioritized safety of pedestrians. The trail design is 6’ wide and paved with 5” deep concrete. The overall cost of the recommended alternative is estimated at $17,800. This design area can be found on drawing sheets 24-31 and Figure 9.

The fourth priority for redesign is in the North-East portion of Preston along Highway 64. Preston would like a pedestrian sidewalk connecting Dollar General and Geno’s Pizza to the

existing sidewalk at Winter St and Highway 64. The trail design is 6’ wide and paved with 5” deep concrete. The estimated cost of this priority is estimated at $126,500. This design can be found on drawing sheets 5 and 6 and Figures 3 and 4.

The final priority is to connect the new South-Western neighborhood development to School Street. The sidewalk design is 5’ wide, 895 linear feet long, and paved with 4” deep concrete. The overall cost of this priority is estimated at $64,500. This design area can be found on drawing sheets 21-23 as well as Figure 8.

If the recommended alternatives for each of the 5 focus areas is constructed the total cost would be around $255,500.

Organization, Qualifications, and Experience

The Project Team is comprised of three senior engineering students in the capstone design class at the University of Iowa located at 103 S Capital St. Iowa City IA 52242. The primary contact for this project was Hannah DeBruin. See below for team member introductions and qualifications.

Hannah DeBruin - project manager

I am excited to serve the community of Preston as project manager of this design group. In my time as a transportation focused civil engineering student at the University of Iowa, I have developed relevant technical skills in courses such as Design of Transportation Systems, Traffic Engineering, Transportation Demand Analysis, Transportation Economics, and Transportation Policy and Planning. I have also completed internships with the City of West Des Moines and the Metropolitan Planning Organization of Johnson County that have familiarized me with the local government processes necessary to implement and fund new design. Through coursework and internships, I have also gained experience with software such as Civil 3D, ArcGIS, and Synchro that will be useful to this project. At work I am currently working on a Pedestrian Collision Analysis for the City of Iowa City, and three semesters ago I also designed an outdoor fitness trail as part of a design class. For this project, I was responsible for the Highway 64 crossings and Highway 64 Side Path.

Kalynn Burton – editor

As a senior civil engineering student in the capstone design class, I have taken on the role of report editor. My focus area includes urban and regional planning and transportation. I have previous work experience with the Iowa Department of Transportation which has allowed me to gain exposure to industry standards and requirements as they are applicable to this project.

Additionally, in a related class I have completed a recreational trail design project similar to this proposal. For this project, I was responsible for the School Street design alternatives and subdivision sidewalks.

Ernesto Flores – technical support:

As a senior civil engineering student in the capstone design class, I have taken the role of technical support. My focus area includes transportation. I have work experience with Shive-Hattery, Inc. Architecture and Engineering. The company allowed me to practice using Civil3D and other design methods which could be used for this project. Furthermore, I designed an outdoor fitness trail for a design class last fall. For this project, I was responsible for the Copper Creek Trail extension alternatives.

Design Services

Project Scope

The Project Team has identified problem areas with the current mobility of nonmotorized transportation in Preston and has generated this report to propose some countermeasures to improve the conditions for walking and biking within the city. The Project Team produced an engineering design solution (trail/sidewalk connections, signage, and traffic control) to improve connectivity across the city, with special care given to the Highway 64 crossing at Main Street and Mitchell Street, a trail connection from Copper Creek to the School Street Park, side path connection from Winter Street to Geno's Pizza, sidewalks along School Street, and sidewalks in the new subdivision southwest of town. All design areas are shown in Figure 1. Throughout this design process there has been an emphasis on safe routes to get to and from Easton Valley Junior/High School.

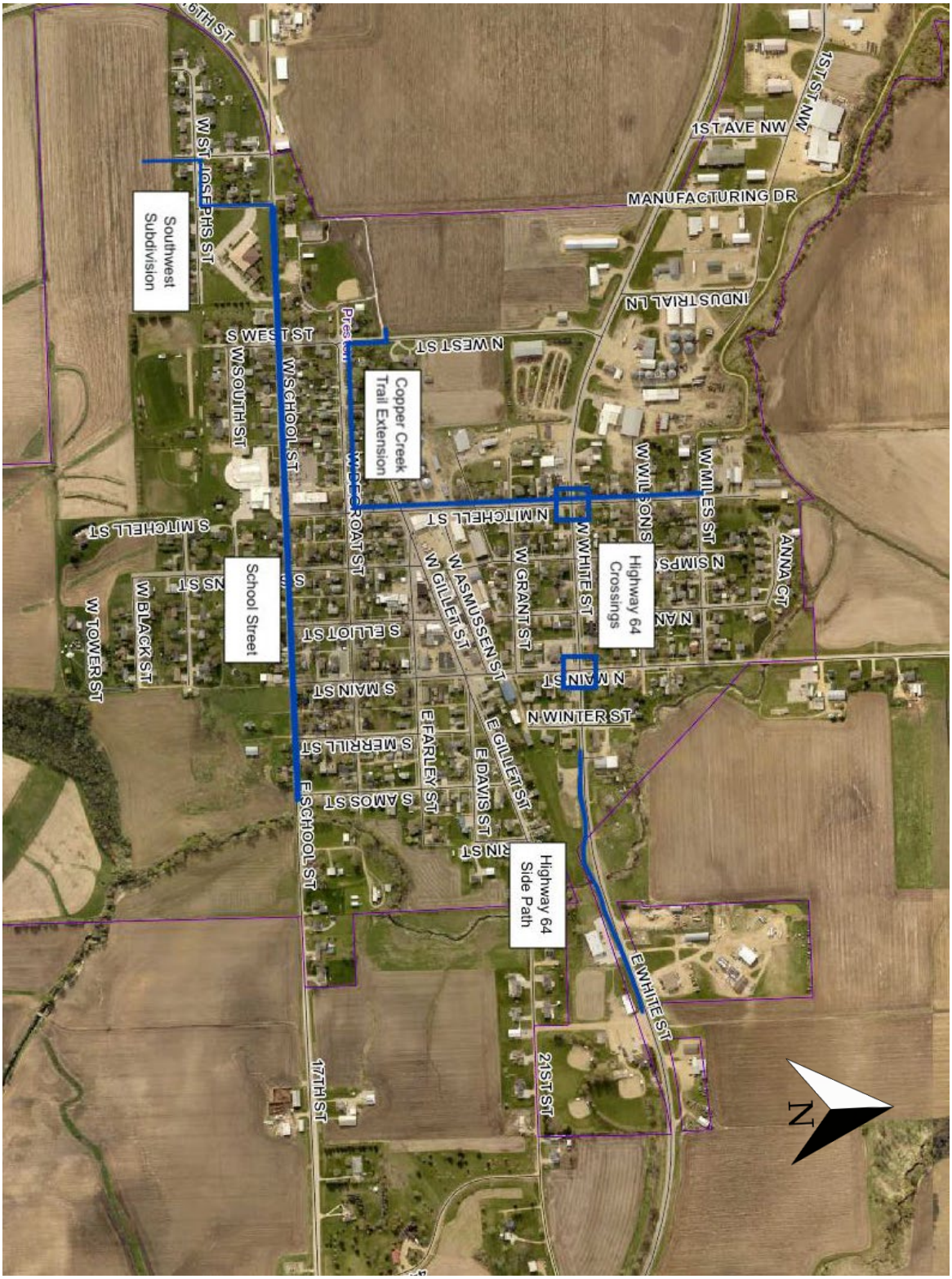


Figure 1: Project area including 5 focus areas[2]

The major tasks for data collection, preparation, preliminary design, design revisions, report creation, and final presentation is shown below in the Gantt Chart. A full detailed Gantt Chart is available in Appendix E.

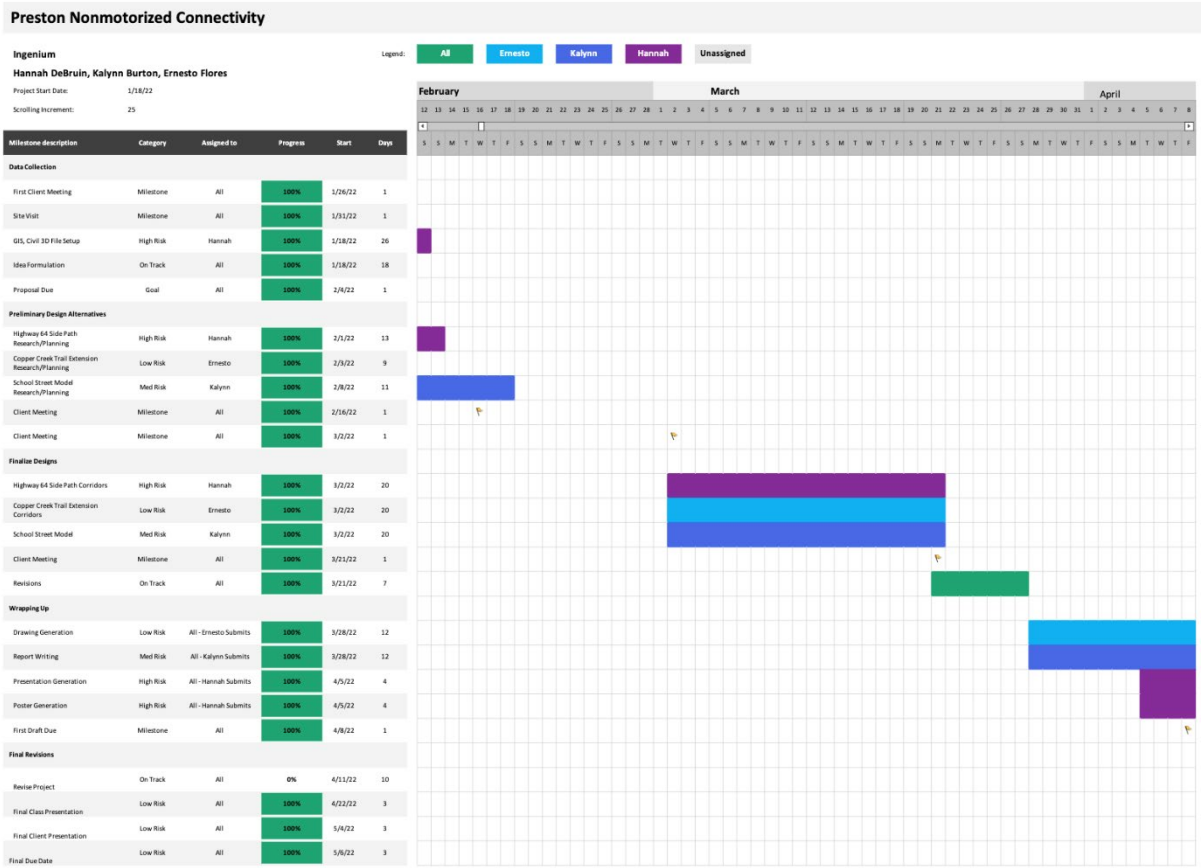


Figure 2: Gantt chart depicting timeline of design services

Methods

For guidance on the data needed to identify and assess factors affecting non-motorized safety and ideas of potential countermeasures, the Project Team utilized the Federal Highway Administration's Non-Motorized User Safety Manual for Local Rural Road Owners. The 2019 World Resources Institute report 'The 8 Principles of Sidewalks' aided decisions about the width, grade, and material of sidewalks. For assistance with dimensioning and marking the

School Street Pedestrian Lane, the team consulted the San Diego Regional Planning Agency's 2002 'Planning and Designing for Pedestrians' document, chapter 4.

Design Guides

In the engineering design of sidewalks, trails, and pedestrian crossing facilities, the team used a combination of resources to insure an accessible, safe, and efficiently constructed design. The Iowa DOT's Design Manual Chapter 12 includes all the necessary dimensions, grades, and material requirements for safe and accessible pedestrian design. Any signage recommendations must follow the Manual for Uniform Traffic Control Devices[12].

Constraints, Challenges, and Impacts

Constraints

The main constraint throughout design was the challenge of designing within existing right-of-way and out of the way of utilities such as electric power poles.

Challenges

A challenge is the installation of sidewalks. Since many of the existing homes do not have sidewalks in the city, changing the minds of homeowners to pay to install and maintain a sidewalk on their property will be difficult. Designs follow all ADA and DOT standards so that the city can be eligible for local, state, and federal funding and grant programs. A collection of the funding sources for each eligible design area is available in Appendix B.

Another challenge to design was a culvert near Dollar General on E White St/Highway 64. The side path designed along Highway 64 uses the existing right-of-way for the highway and crosses over the culvert parallel to the road. However, to address the steep slope and safety of the crossing, guard rails must be installed over the culvert.

Steep slopes and existing retaining wall in the right of way posed a challenge to designing sidewalks along the East end of the South side of School St.

Incorporating a community-engaged mural on the pavement for the School Street pedestrian lane had the challenge of maintenance of the mural year to year and through the winter season. Because the mural is on-street and will be maintained by plows and road salt, the traffic paint will likely fade throughout the course of the year. Working with the Easton Valley Junior/High School on the design was an important step in considering this maintenance—Denise Larson, the art teacher at the school, would be willing to incorporate touch-ups to the mural into her curriculum year to year.

One general challenge throughout the design process was the lack of precise spatial data reflecting the locations of utilities, property lines, and pavement shoulders. The Project Team did their best to digitize this information using aerials and the Beacon property viewer website and designed around those created shape files and lines.

Societal Impacts

As the goal of the proposal is to increase nonmotorized connectivity in Preston, some societal impacts will occur. Increased community connectivity will create a more desirable area thus encouraging population influx. The most likely demographic of new residents will be young adults. This effect was deemed desirable by the community. Another societal impact would be more positive perception of health and safety due to increased pedestrian infrastructure providing a buffer between pedestrians and motorized vehicles. There will be an impact on community resources; recreation resources will be more readily available, but this additional infrastructure could be costly. In order to mitigate the cost, the goals of the project include identifying possible funding sources to alleviate community stress. The work required to implement many of the

possible sidewalk designs will be invasive to individual homeowners. The community and individual homeowners must decide what level of disturbance is allowable to achieve the desired outcome.

Alternative Solutions

Highway 64 Side Path

A side path or sidewalk does exist in the existing Highway 64 right of way, so the Project Team considered locating the design both north and south of the highway. According to the natural gas line supervisor who accompanied the team on the site visit, most of the utilities are on the north side of the street. Because of this convenience, and to avoid crossing Highway 64 unnecessarily farther east of town where the speed limit is higher, the side path or sidewalk was best suited to the south side of Highway 64.

The major design alternatives considered in routing of the path involved where it ties into Dollar General and Geno's Pizza: either into the parking lot (Figure 4) or across driveways (Figure 3). If the path connected through the parking lot, an easement from Dollar General may have been required, and for this reason, the Project Team pursued the alternative crossing driveways.

Figure 3: Sidewalk path bypassing parking lot[2]

Figure 4: Sidewalk path utilizing parking lot[2]

Highway 64 Crossings

To better accommodate pedestrians crossing Highway 64 at Main Street and Mitchell Street, the Project Team considered traffic control on Highway 64, roundabout installation, raised crosswalks, extended curb cuts, and flashing beacon pedestrian crossing warning signage near the intersections. Ultimately, neither traffic signals nor all-way stops were warranted because of Highway 64's traffic volume, and roundabouts, curb cuts, and raised crosswalks prompted concerns about cost and ease of winter maintenance. Flashing beacon pedestrian crossing warning signs were determined to be the best solution for cost savings and increased driver awareness of pedestrian crossings.

Highway 64 has an estimated annual average daily traffic of 2,750 vehicles along the segment that runs through Preston, and the speed limit varies from 55 mph outside of town down to 30 mph between Degroat Street and Winter Street. There are not many physical roadway changes between the 55 mph and 30 mph segments, which may contribute to speeding driver behavior through the town. Currently, signage and painted crosswalks exist warning drivers of pedestrian crossings at Main Street and Mitchell Street. However, there is still concern about the safety and accessibility of pedestrian crossings at these two locations.

The City of Preston has submitted a request to the Iowa DOT about installing Rectangular Rapid Flashing Beacons for the crossings at Main Street and Mitchell Street, and the DOT has been hesitant about the project because the intersections are currently not ADA compliant. Considering this, for the best chance at approval, a complete upgrade of the intersection incorporating ADA-accessible curb ramps as discussed in SUDAS has been designed.

Figure 5: Highway 64 Crossing focus area[2]

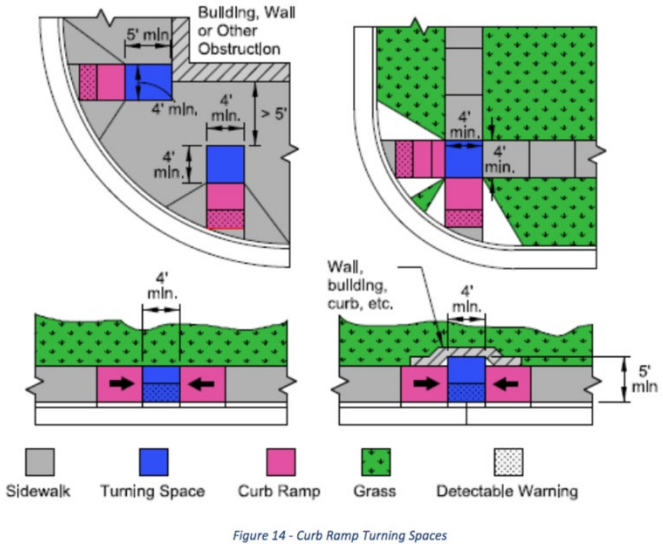


Figure 14 - Curb Ramp Turning Spaces

Figure 6: Example intersections[13]

School Street

The design alternatives provided for this area are sidewalk along the North side of School St, sidewalk along the South side of School St. and a pedestrian lane in School St. adjacent to the south curb line. All three alternatives have been fully designed and the recommended design alternative is alternative 1 based on cost. For more background on the area; the local junior and senior high school is located on an East-West road School Street. School St. is a 2-lane paved road with on street parking allowed on both sides. Currently, minimal sidewalk infrastructure exists on the North side of the road, West of the school. This section is outlined in orange in Figure 7. Students and residents currently walk in the road to access nearby religious institutions. The intention of this section of development is to provide pedestrian infrastructure preferably on the south side of the road to minimize pedestrian, car intersections. Additional design options include a sidewalk on the north side of the road, or a reduction in on street parking to allow space for an on-street pedestrian and bike lane. It may be beneficial to consider alternative solutions on the East side of the school. To the East of the school, on the South side of the road a need for

retaining wall is evident to place sidewalk. This area of concern is identified in yellow on Figure 7. Additionally, homeowners have installed their own retaining walls in this area that will pose difficult and expensive to remove and redesign. To the West of the school, a community priority is placed to put the sidewalk on the South of the road. A drainage ditch may be difficult to fill to construct sidewalk. This is identified in blue on Figure 7. The final design recommended is alternative 1 on the basis of low cost. As pedestrians are currently using the roadway for the same use with no safety issues, there is no evidence to suggest that the pedestrian lane will pose a safety concern.

Figure 7: School Street focus area[1]

South-West Neighborhood Development

The design options for this area focus on installing sidewalks on the East or West sides of Hope St or the East or West sides of Faith St. Additionally it may have been necessary to include sidewalk along St. Joseph Street. This focus area is in the South-West portion of Preston and has been recently developed. Further neighborhood expansion is anticipated to the immediate south. A sidewalk requirement is included in the subdivision ordinance for this new neighborhood however, there is a small portion of roadway along Hope St. or Faith St. where adding sidewalks would greatly increase connectivity to School St. Currently, the South side of School St between Hope St. and Faith St is utilized as a drainage ditch. In order to install sidewalk in the area, the ditch would need to be filled and storm sewer would need to be installed. The final design for the Southwest Neighborhood development included sidewalk along the West side of Faith St. to

connect School St. to St Joseph St. The sidewalk then proceeds West to Hope St. along the North side of St Joseph St. This design was chosen to avoid large costs associated with filling in the ditch along the South side of School St between Hope St. and Faith St

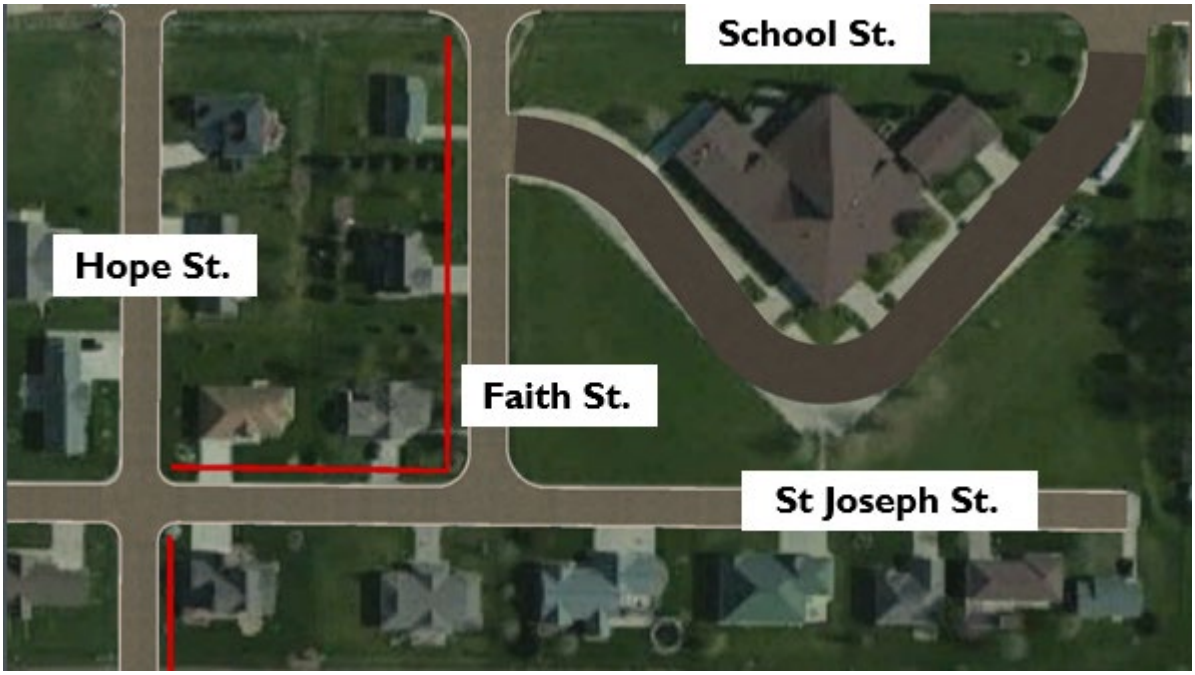


Figure 8: South-West Neighborhood Development focus area and final design[1]

Copper Creek Trail Connection

The design options for this area focus on installing sidewalks that are to connect to Copper Creek Trail and the existing walking path south of the city along West St. Four alternatives have been designed and Alternative 4 is the recommended choice. Highway 64 crossing currently has a speed limit of 45-mph west of town which would need to decrease in order to install a safe pedestrian crossing as marked in orange in Figure 9. The Iowa DOT will likely not reduce the speed leaving us to produce other options. Alternative 2 will be utilizing the existing crossing at Mitchell St since that is where the trail ends. It would run along Mitchell St cross onto Highway 64 and run along the highway until crossing onto West St and going south, it is the blue line in

Figure 9. Alternative 3 will again using the existing sidewalk running along Mitchell St until reaching Grant St and head west and then cross West St, the green line in Figure 9. Finally, the 4th alternative will be using the existing sidewalk along Mitchell St and West of Degroat St, then head north until reaching the existing walking path, the red line in Figure10. The Project Team recommend choosing Alternative 3 because it is cost-effective. For a large part of this alternative the existing sidewalk would be used creating an easier construction project.

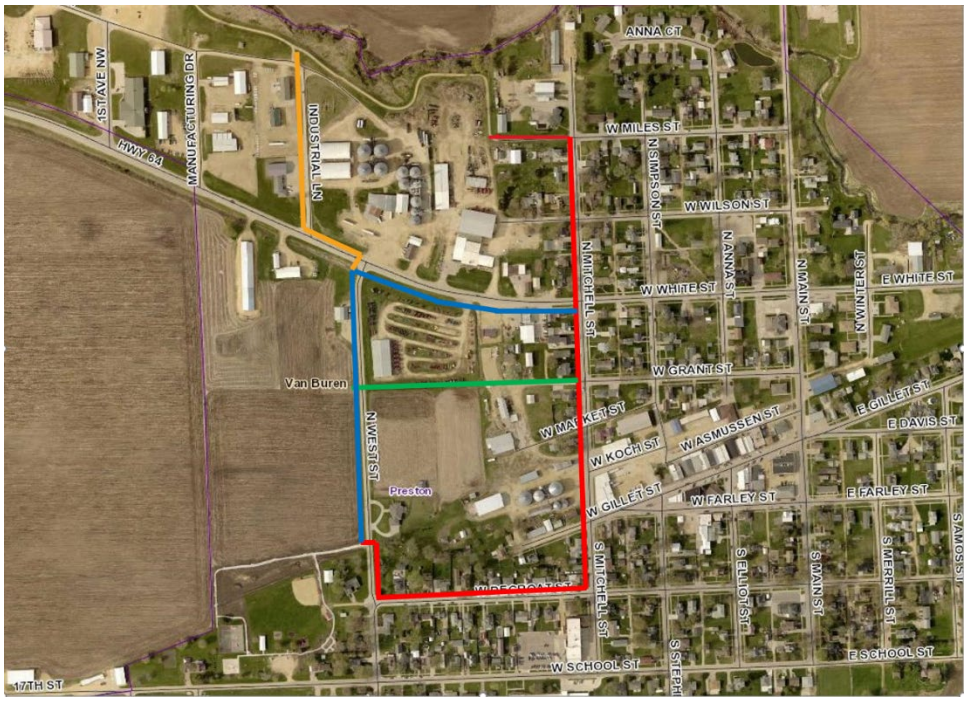


Figure 9: Copper Creek Trail focus area[2]

Final Design Details

Highway 64 Side path

To avoid issues with ROW acquisition crossing the Dollar General parking lot, the Project Team pursued the design alternative that follows the ROW of Highway 64 on the south side of the highway from Winter Street east to Geno's Pizza. To determine the width of the trail and

horizontal and vertical alignment variables, Chapter 12B-2 of the Iowa DOT Design Manual provided specific guidance on Shared Use Path Design.

Because the path is adjacent to a roadway, it is identified as Type 1. Ideally, the width of this path to accommodate two-way cyclist traffic is 10 feet. However, due to a constrained width of ROW, the location of power poles on this side of the street, and the trail's focus on elderly pedestrian mobility more so than on recreational cycling, the width was changed to 6 feet.

Because the focus was on slower-moving pedestrians, the design speed was also chosen at the lower end of the spectrum at 12 mph, which (factoring in a cyclist's lean angle) corresponded with a 27' minimum design radius. This calculation is attached in Appendix F.

Horizontal routing of the trail was created on Civil 3D using the horizontal alignment tool tangent-tangent with curves, with special consideration given to the horizontal clearance widths required by the Iowa DOT Design Manual. There was a required 5' separation from the roadway and 1' minimum offset between the edge of the path and power poles when the poles are marked with object markers. The decided route's plan-profile drawings are on sheets 5-6.

Closest to Winter Street, to meet all radius and offset requirements, 5' of ROW acquisition from parcel #882028308043000 would be required and 10' of ROW acquisition from parcel #882028308044000 would be required. The value of that land per square foot was assessed from the Jackson County property viewer Beacon, then multiplied by the area required from each property (675 square feet from parcel #882028308043000 and 600 square feet from parcel #882028308044000) to determine a cost estimate. The cost estimate is likely low, as it's based on assessed value and not comparative market value.

Because the side path is crossing a gravel driveway on parcel #882028308010000, the DOT Design Manual Chapter 12B-2 requires that driveway to be paved within 20’ of the trail to reduce the amount of gravel/debris tracked over the trail. The existing driveway width (28’) and turning radius (6’) were determined from the aerial, and drawing sheet 4 mapped out the area where 6” concrete slab should be poured to meet this requirement.

The vertical routing of the trail used the Civil 3D profile creation tool to try to balance cut and fill volumes and maintain an ADA accessible max running slope of 5%. A design maximum running slope of 3% was used for better accessibility, and the recommended cross slope of 1.5% was used for stormwater runoff. Using the design speed of 12 mph and maximum grade of 3% and typically coefficient of friction for a bicycle, 0.16, the stopping sight distance calculated using Equation 12B-2.02 was about 70 feet. Using Equation 12B-2.01, this stopping sight distance corresponds to a minimum length of vertical curve of about 32 feet. These calculations are attached in Appendix F.

Because the path crosses over an existing culvert, the design manual requires guard rail protecting trail users from a steep drop. According to the Iowa DOT Design Manual Chapter 12B-2, guard rail must be 3.5’ high, and to cross the culvert the segment must be 25’ long.

The pavement and subbase thickness were determined by the Iowa DOT manual requirement that pavement crossing driveways be 6” and the Preston City Ordinance requirement that the subbase thickness be 4” of compact, clean, coarse gravel. The cross-section of this pavement and the rebar reinforcement structure can be seen in drawing sheet 3.

As part of the side path connection to Winter Street, ADA-compliant curb ramps and tactile warning tiles were planned in alignment with the start of the path and crossing Winter Street.

Using the Iowa DOT Design Manual Chapter 12A-2, the maximum curb ramp slope is 8.3%. The curb depth was about 6” throughout Preston, so the curb ramp required 6.05’ of length. Two feet of that length was required to be tactile/detectable warning tile. These details are shown on drawing sheet 2.

Highway 64 Crossings

At the Main Street and Mitchell Street crossings of Highway 64, the Project Team pursued the design using flashing pedestrian beacons as a low-cost and effective. This design involved upgrading the intersections to be ADA accessible. The Project Team found that upgrading is not technically required for DOT approval of sign installation as, per Section 12A-2 of the Iowa DOT Design Manual, installing additional signage does not constitute an improvement to the intersection. However, these crossing locations are essential for mobility within Preston and should be universally accessible.

Curb ramps were the focus of this improvement. Using the Iowa DOT Design Manual Chapter 12A-2, the maximum curb ramp slope is 8.3%. The curb depth was about 6” throughout Preston, so the curb ramp required 6.05’ of length. Two feet of that length was required to be tactile/detectable warning tile. At the Main Street intersection, one-way perpendicular ramps were possible on all approaches. On Mitchell Street, there was only space for long enough curb ramps on the northeast corner without moving existing sidewalks. The other three corners of the Mitchell Street intersection required a two-way retrofit curb ramp swept along the curb radius.

Crosswalks were deemed necessary crossing Highway 64 only because of the high traffic volumes. The flashing beacon warning signs were selected by the client and placed on the outsides of town to warn vehicles of pedestrians in the crosswalk. The posts were placed within one foot of the curb ramp waiting area to meet ADA standards.

School Street

With the goal of providing safe connections between Easton Valley School and St. Joseph Catholic Church, 3 design alternatives have been created. Cost estimates for the alternatives can be found in Appendix B and a maintenance plan can be found in Appendix C.

School Street Alternative 1

Alternative 1 for the School Street design includes use of a pedestrian lane extending from St. Joseph Catholic Church to Main St. This design alternative was considered to reduce cost and allow for alternatives for homeowners who are resistant to sidewalk installation. On street parking on the South side of the road will be removed in order to allow space for the pedestrian lane and buffer zone. The pedestrian lane is 8 ft. wide with a 2 ft. painted buffer to separate traffic from the pedestrian zone[10]. Flexible delineators were considered in the buffer zone as well, but ultimately were not recommended. The delineators would rapidly degrade pavement quality as they require attachment to the pavement with the most long-lasting option including screwing a baseplate to the existing roadway. Additionally, the baseplates could be caught by snowplows and be ripped from the roadway causing damage to both the pavement and plow. Maintenance and replacement of these devices would be costly and outweighs the benefits provided. The pedestrian lane design was completed to the standards set forth in the article Pedestrian Lane written by the Small Town and Rural Design Guide in coordination with the Federal Highway Administration. No crosswalk painting will be required on the basis of MUTCD design standards. This design alternative can be seen in drawing sheets 10-12 as well as below in Figures 10 and 11.

Figure 10 Alignment of pedestrian lane in School St.[1]

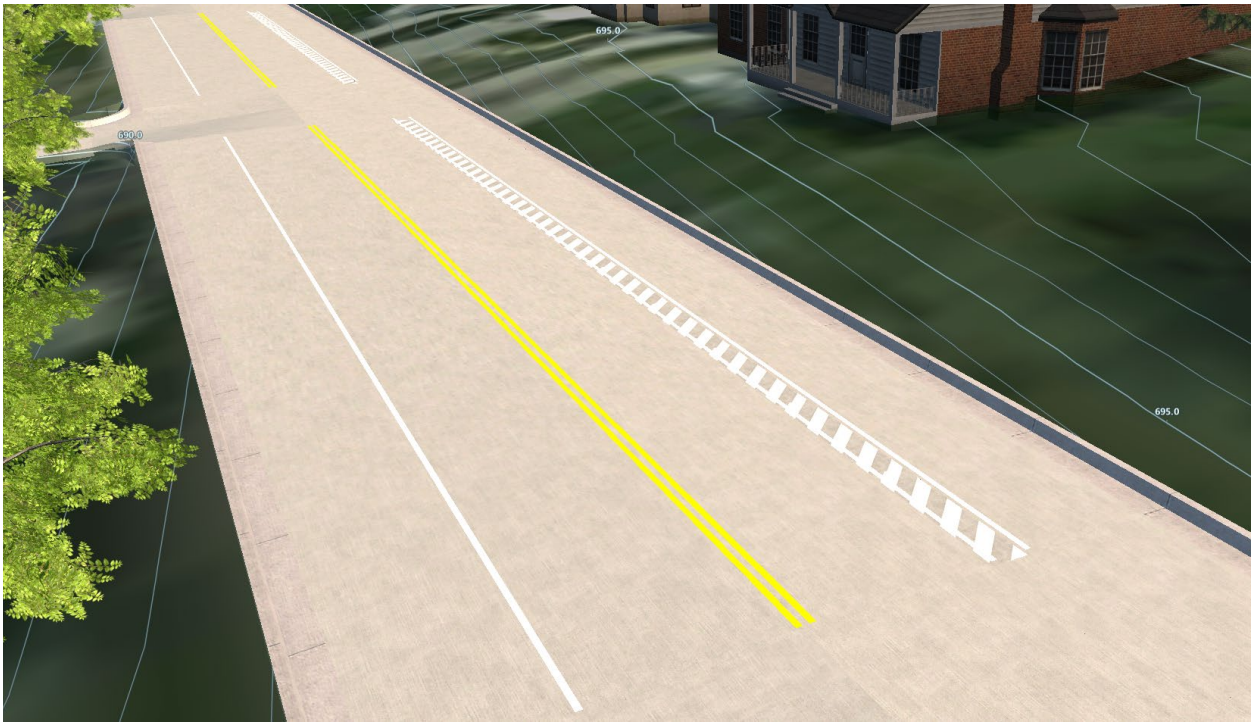


Figure 11 Graphic of 3D rendering of pedestrian lane showing lane paint markings[1]

The creative piece of this alternative is the community-engaged mural. Art students at Easton Valley Junior/High School in coordination with teacher Denise Larson provided design ideas for a painted pavement segment 150’ long directly in front of the school building. Details about the final design selection, materials used, approval process, and installation process are included in the comprehensive public art report (Appendix G).

School Street Alternative 2

This alternative design for School Street included installation of sidewalks along the North side of School St. between Main Street and Mitchell Street as well as Degroat Street and Hope Street. The sidewalk is considered a Class B sidewalk. As a portion of the roadway has existing sidewalk along the North side of the road, 2 alignments were created around the existing infrastructure. The new sidewalks meet all ADA requirements; 5 foot width, no horizontal curves, vertical curves less that 5%, cross slopes less than 1.5%, and inclusion of curb ramps and detectible warnings anywhere sidewalk crosses the roadway. No crosswalk painting will be required on the basis of MUTCD design standards. This alternative can be seen in drawing sheets 13 and 14 as well as Figure 12.

Figure 12 Infraworks model depicting School St. Alternative 2[1]

School Street Alternative 3

The final School Street alternative includes instillation along the South side of the roadway extending between Main Street and Hope Street. No sidewalk currently exists along this portion of the road. A portion of the roadway starting 180 ft. East of Stephens St. is anticipated to need retaining wall. For this reason, the sidewalk will remain closer to the roadway to limit costs associated with soil removal and additional retaining wall height. The retaining wall design used is Iowa DOT standard road plan MI 221. In this portion of the pedestrian roadway, the sidewalk will be combined with the retaining wall to both save space and provide stability. The sidewalk in both this area and the remainder of the sidewalk for this alternative meets all ADA requirements; 5 foot width, no horizontal curves, vertical curves less that 5%, cross slopes less

than 1.5%, and inclusion of curb ramps and detectible warnings anywhere sidewalk crosses the roadway. No crosswalk painting will be required on the basis of MUTCD design standards. This alternative can be seen in drawing sheets 15-18. It is recommended if this alternative is to be constructed that new construction coincides with repairs or replacement of existing retaining wall. There are 4 homes along the East end of the project that currently have retaining wall in the right of way. As the retaining walls are all in varying condition, it would be appropriate to wait until each property's retaining wall is in need of repairs or replacement to install new sidewalk rather than attempting to install the new path all at once. This method should decrease cost and hardships to the property owner. Additionally, sidewalks should be placed as close to the road as is deemed fit by Prestons' City Council. Currently, Preston's code of ordinances requires the outside edge of sidewalk be placed on the property line however, in this situation it is recommended that the Council considers approval of aligning the sidewalk closer to the roadway to limit cost. Reducing space between curb line and sidewalk will reduce cost related to retaining wall and excavation. Figure 13 shows an alignment wherein red represents traditional sidewalk and blue represents the sidewalk and retaining wall design MI 221 from the Iowa DOT.

Figure 13 Infraworks model depicting School St. Alternative 3[1]

Southwest Neighborhood Development

This portion of sidewalk was deemed a Class B sidewalk by Chapter 12A-1 of the Iowa DOT design manual and design speed was set at 5 miles per hour as the path is anticipated to be used primarily for foot traffic. Three separate alignments were created for each portion of sidewalk in

the neighborhood. The existing alignment successfully connects School Street to the anticipated development South of St. Joseph St. The chosen path differs from the original concept to avoid installing additional sidewalk along the south side of School St. as this area is currently used for drainage. The sidewalk design was created to meet all ADA requirements. The width is set at 5 feet, no horizontal curves were included, and all vertical curves remain under the 5% limit. Curb ramps and detectable warnings will be installed in all areas where sidewalks cross roadways. No crosswalk painting will be required on the basis of MUTCD design standards. This design can be seen in drawing sheets 19-21 as well as Figure 8.

Copper Creek Trail Connection

Copper Creek Alternative 1

The class of the sidewalk was determined to be Class B using SUDAS, Chapter 12A-1, Section B. Since an average person walks about 3 to 4 miles per hour, the design speed was set at 5 mph. A minimum of 10 feet was calculated using minimum radius equations. For design calculations, see Appendix F. It should be generally planar within the pedestrian access routes and must be smooth to accommodate for wheelchairs, scooters, and walkers. The maximum running slope is 5% anything less acceptable using SUDAS, Chapter 12A-1, Section E2a. The width of the sidewalk will be 6 feet wide to accommodate two-way traffic for walking pedestrians. The minimum width is 4 feet, but 5 feet are encouraged and may be required in some jurisdictions using SUDAS Chapter 12A-2, Section E2c. The cross slope has a maximum of 2% with a target value of 1.5% SUDAS, Chapter 12A-2, Section E2b. The pavement thickness of the sidewalk will be 5 inches of PCC using Preston City Ordinance pg. 219. The subbase thickness will be 4 inches of compact, clean, coarse gravel, Preston City Ordinance pg. 219. Refer to drawing sheet 3 for the pavement cross section showing these dimensions.

A crossing is placed on Industrial Lane to cross from the west side of the street onto the east side of the street. Two ADA tactile devices will be installed. A crossing is placed on Highway 64 to cross from the north side of the road onto West St. Two ADA tactile devises will be installed. A form will be sent to the DOT to change the original speed limit of 45 mph to a safer speed limit of 30 mph for pedestrians that cross.

Copper Creek Alternative 2

The class of the sidewalk was determined to be Class B using SUDAS, Chapter 12A-1, Section B. Since an average person walks about 3 to 4 miles per hour, the design speed was set at 5 mph. A minimum of 10 feet was calculated using minimum radius equations. For design calculations, see Appendix F. It should be generally planar within the pedestrian access routes and must be smooth to accommodate for wheelchairs, scooters, and walkers. The maximum running slope is 5% anything less acceptable using SUDAS, Chapter 12A-1, Section E2a. The width of the sidewalk will be 6 feet wide to accommodate two-way traffic for walking pedestrians. The minimum width is 4 feet, but 5 feet are encouraged and may be required in some jurisdictions using SUDAS Chapter 12A-2, Section E2c. The cross slope has a maximum of 2% with a target value of 1.5% SUDAS, Chapter 12A-2, Section E2b. The pavement thickness of the sidewalk will be 5 inches of PCC using Preston City Ordinance pg. 219. The subbase thickness will be 4 inches of compact, clean, coarse gravel, Preston City Ordinance pg. 219. Refer to drawing sheet 3 for the pavement cross section showing these dimensions.

Pedestrians will be able to cross Highway 64 by using the existing crossing marking of N Mitchell St. A crossing is placed on West St to cross from the east side Highway 64 onto the west side of Highway 64. Four ADA tactile devices will be installed.

Copper Creek Alternative 3

The class of the sidewalk was determined to be Class B using SUDAS, Chapter 12A-1, Section B. Since an average person walks about 3 to 4 miles per hour, the design speed was set at 5 mph. A minimum of 10 feet was calculated using minimum radius equations. For design calculations, see Appendix F. It should be planar within the pedestrian access routes and must be smooth to accommodate for wheelchairs, scooters, and walkers. The maximum running slope is 5% anything less acceptable using SUDAS, Chapter 12A-1, Section. The width of the sidewalk will be 6 feet wide to accommodate two-way traffic for walking pedestrians. The minimum width is 4 feet, but 5 feet are encouraged and may be required in some Jurisdiction using SUDAS Chapter 12A-2, Section E2c. The cross slope has a maximum of 2% with a target value of 1.5% SUDAS, Chapter 12A-2, Section E2b. The pavement thickness of the sidewalk will be 5 inches of PCC using Preston City Ordinance pg. 219. The subbase thickness will be 4 inches of compact, clean, coarse gravel, Preston City Ordinance pg. 219. Refer to drawing sheet 3 for the pavement cross section showing these dimensions.

A crossing is placed on West St to cross from the east side of the extended sidewalk of Grant St onto the south side of West St. Four ADA tactile devises will be installed. See drawing sheet 9 for the crossing locations.

Copper Creek Alternative 4

The class of the sidewalk was determined to be Class B using SUDAS, Chapter 12A-1, Section B. Since an average person walks about 3 to 4 miles per hour, the design speed was set at 5 mph. A minimum of 10 feet was calculated using minimum radius equations. For design calculations, see Appendix F. It should be planar within the pedestrian access routes and must be smooth to accommodate for wheelchairs, scooters, and walkers. The maximum running slope is 5%

anything less acceptable using SUDAS, Chapter 12A-1, Section E2a. The width of the sidewalk will be 6 feet wide to accommodate two-way traffic for walking pedestrians. The minimum width is 4 feet, but 5 feet are encouraged and may be required in some jurisdictions using SUDAS Chapter 12A-2, Section E2c. The cross slope has a maximum of 2% with a target value of 1.5% SUDAS, Chapter 12A-2, Section E2b. The pavement thickness of the sidewalk will be 5 inches of PCC using Preston City Ordinance pg. 219. The subbase thickness will be 4 inches of compact, clean, coarse gravel, Preston City Ordinance pg. 219. Refer to drawing sheet 3 for the pavement cross section showing these dimensions.

A crossing is placed on West St to cross from the east side of the road onto the west side of the road. Two ADA tactile devices will be installed. See drawing sheet 9 for the crossing locations.

Cost Proposal

Construction Estimate

All cost estimates determined using Iowa DOT awarded contract prices, letting date April 19th 2022. For all estimates, construction cost includes all material purchase, labor, equipment, overhead and profit. Contingency cost is included to cover any unexpected costs throughout construction and reflects the industry standard, 10% of construction costs. Engineering and administration costs pay for project management during construction. The amount is based on an industry standard of 20% of construction costs. If the recommended alternatives for each of the 5 focus areas is constructed, the total cost would be around $255,500.

Highway 64 Side Path

A cost estimate for the Highway 64 side path is as follows. A small amount of property acquisition will be needed for this project. The items included in construction costs are concrete

sidewalk, subbase, reinforcing steel, detectable warnings, curb, object marker signs, curb removal, sidewalk removal, and handrail. The total project cost is estimated at $126,500 and a cost breakdown can be found in appendix B

Highway 64 Crossings

A cost estimate for the Highway 64 crossings is as follows. The items included in construction costs are concrete sidewalk, subbase, reinforcing steel, detectable warnings, curb, flashing beacons, cross walk paint, curb removal, and sidewalk removal. The total project cost is estimated at $28,800 and a cost breakdown can be found in appendix B

School St.

Cost estimates for each School St. alternative are as follows. As a reminder, alternative 1 is a roadway pedestrian lane, alternative 2 is sidewalk along the North side of the road and alternative 3 is sidewalk along the South side of the road. The items included in construction costs vary between alternatives and can be found in appendix B. Generally, the items included are painted symbols, painted lines, signs, concrete sidewalk, subbase, reinforcing steel, detectable warnings, curb, and curb removal. The total project cost for alternative 1 is estimated at $18,000, alternative 2 is estimated at $128,000, and alternative 3 is estimated at $138,500. Cost breakdowns by alternative are provided in appendix B.

South-West Neighborhood Development

A cost estimate South-West Neighborhood development focus area is as follows. The items included in construction costs are concrete sidewalk, subbase, reinforcing steel, detectable

warnings, curb, and curb removal. The total project cost is estimated at $64,500 and a cost breakdown can be found in appendix B

Copper Creek Trail Connection

Cost estimates for each Copper Creek Trail connection alternative are as follows. The differences in alternatives can be found in the final design section on pages 26-29. The items included in construction costs vary between alternatives and can be found in appendix B. Generally, the items included are concrete sidewalk, subbase, reinforcing steel, detectable warnings, curb, curb removal, and cross walk paint. Alternative 1 cost is estimated at $123,500, alternative 2 $93,000, alternative 3 $116,500, and alternative 4 which is the recommended alternative $17,800. Cost breakdowns by alternative are provided in appendix B.

Appendices

Table of Contents

Appendix A (Redacted)

Appendix B - Cost Breakout

Highway 64 Side Path

Item	Unit	Unit Cost	Quantity	Cost
PCC-6 in	SY	68.38	1112.993	75000
Subbase-4 in	SY	5.373333	1112.993	5975
Reinforcing Steel	LB	1.45	5231.068	7575
ADA tactile devices	EACH	46.94	20	940
Curb	LF	44.68	12	535
Type A object marker signs	SF	24.16	30	725
Curb removal	STA	827.31	0.24	200
Sidewalk Removal	SY	11.88	83.33333	990
Hand rail	LF	130.47	25	3250
Land acquisition	SF	0.772852	1275	980
Construction Subtotal				97500
10% Contingencies				9725
20% Engineering and Administration				19500
Total Cost				126500

Highway 64 Crossings

Item	Unit	Unit Cost	Quantity	Cost
PCC-6 in	SY	68.38	26.66667	1825
Subbase-4 in	SY	5.373333	26.66667	145
Reinforcing Steel	LB	1.45	120.32	175
ADA tactile devices	EACH	46.94	200	9400
Curb	LF	44.68	0.7	31
Flashing Beacon	EACH	2217.38	4	8875
Cross walk paint	STA	43.74	1.4	61
Curb removal	STA	827.31	1.56	1300
Sidewalk Removal	SY	11.88	26.66667	315
Construction Subtotal				22000
10% Contingencies				2200
20% Engineering and Administration				4425
Total Cost				28700

School St. Alternative 1

Item	Unit	Unit Cost	Quantity	Cost
Painted Symbols	Each	113.59	12	1375
Painted Lines	LF	0.8748	13215.12	11600
Signage	SF	24.16	37.5	905
Construction Subtotal				13800
10% Contingencies				1375
20% Engineering and Administration				2775
Total Cost				18000

School St. Alternative 2

Item	Unit	Unit Cost	Quantity	Cost
PCC-6 in	SY	68.38	1261.58	86500
Subbase-4 in	SY	5.373333	1261.58	6800
Reinforcing Steel	LB	1.45	622.0986	900
ADA tactile devices	EACH	46.94	80	3750
Curb	LF	44.68	48	2150
Curb removal	STA	827.31	0.96	795
Construction Subtotal				100500
10% Contingencies				10000
20% Engineering and Administration				20100
Total Cost				130500

School St. Alternative 3

Item	Unit	Unit Cost	Quantity	Cost
PCC- 6 in	SY	68.38	1261.58	86500
Subbase-4 in	SY	5.373333	1261.58	6775
Reinforcing Steel	LB	1.45	6043.582	8775
ADA tactile devices	EACH	46.94	80	3750
Curb	LF	44.68	48	2150
Curb removal	STA	827.31	0.96	7945
Construction Subtotal				116000
10% Contingencies				11600
20% Engineering and Administration				151000
Total Cost				

South-West Neighborhood Development

Item	Unit	Unit Cost	Quantity	Cost
PCC-6 in	SY	68.38	596.7867	40800
Subbase-4 in	SY	5.373333	596.7867	3200
Reinforcing Steel	LB	1.45	2804.897	4075
ADA tactile devices	EACH	46.94	20	940
Curb	LF	44.68	12	535
Curb removal	STA	827.31	0.24	200
Construction Subtotal				49800
10% Contingencies				4975
20% Engineering and Administration				9950
Total Cost				64500

Copper Creek Alternative 1

Item	Unit	Unit Cost	Quantity	Cost
PCC- 5 in	SY	52.46	1427.233	74872.66
Subbase-4 in	SY	5.373333	1427.233	7669
Reinforcing Steel	LB	1.45	6707.996	9726.594
ADA tactile devices	EACH	46.94	60	2816.4
Cross walk paint	STA	43.74	0.26	11.3724
Construction Subtotal				95096.03
10% Contingencies				9509.603
20% Engineering and Administration				19019.21
Total Cost				123624.8

Copper Creek Alternative 2

Item	Unit	Unit Cost	Quantity	Cost
PCC-5 in	SY	52.46	1109.233	58000
Subbase-4 in	SY	5.373333	1109.233	5950
Reinforcing Steel	LB	1.45	5213.396	7550
Cross walk paint	STA	43.74	0.26	11
Construction Subtotal				71500
10% Contingencies				7175
20% Engineering and Administration				14300
Total Cost				93000

Copper Creek Alternative 3

Item	Unit	Unit Cost	Quantity	Cost
PCC-6 in	SY	68.38	1083.527	74000
Subbase-4 in	SY	5.373333	1083.527	5820
Reinforcing Steel	LB	1.45	5092.575	7375
ADA tactile devices	EACH	46.94	40	1875
Curb	LF	44.68	6	270
Curb removal	STA	827.31	0.12	100
Construction Subtotal				89500
10% Contingencies				8950
20% Engineering and Administration				17900
Total Cost				116500

Copper Creek Alternative 4

Item	Unit	Unit Cost	Quantity	Cost
PCC- 5 in	SY	52.46	196.8667	10300
Subbase-4 in	SY	5.373333	196.8667	1050
Reinforcing Steel	LB	1.45	925.2732	1350
ADA tactile devices	EACH	46.94	20	935
Construction Subtotal				13700
10% Contingencies				1375
20% Engineering and Administration				2725
Total Cost				17800

Appendix C - Maintenance Plan

Roadway Paint Markings

Waterborne or solvent based paint is recommended for painted lines and symbols on the roadway. Waterborne or solvent based paint requires yearly maintenance[7]. Cost per linear foot of line is estimated at $.15[6]. Cost per painted symbol is estimated at $113.59[6]. An alternative option is durable paint as defined in section 2527 of the standard specifications written by the Iowa DOT. It is anticipated the durable paint will need maintenance every 4 years[7] and costs on average $.94 per linear foot of paint line[6]. Cost per painted symbol is estimated at $334.9[6]. As both the paint lines and symbols directly impact pedestrian safety, maintenance on these items should not be deferred.

Mural

Anticipated maintenance or repaint required every year. Sherwin Williams Park Pro traffic paint is recommended by local mural artist working in Preston. As this feature does not impact safety, maintenance could be deferred with the understanding that mural quality will degrade. Cost is dependent on mural size but will average $2.55 per square foot[9] for paint.

Signs

Replacement of signs is anticipated to be required every 10 years[11]. Cost is currently estimated at $24.16 per square foot[6]. A rotating schedule of replacements may be beneficial to avoid accruing large costs at one time.

Appendix D - Funding Table

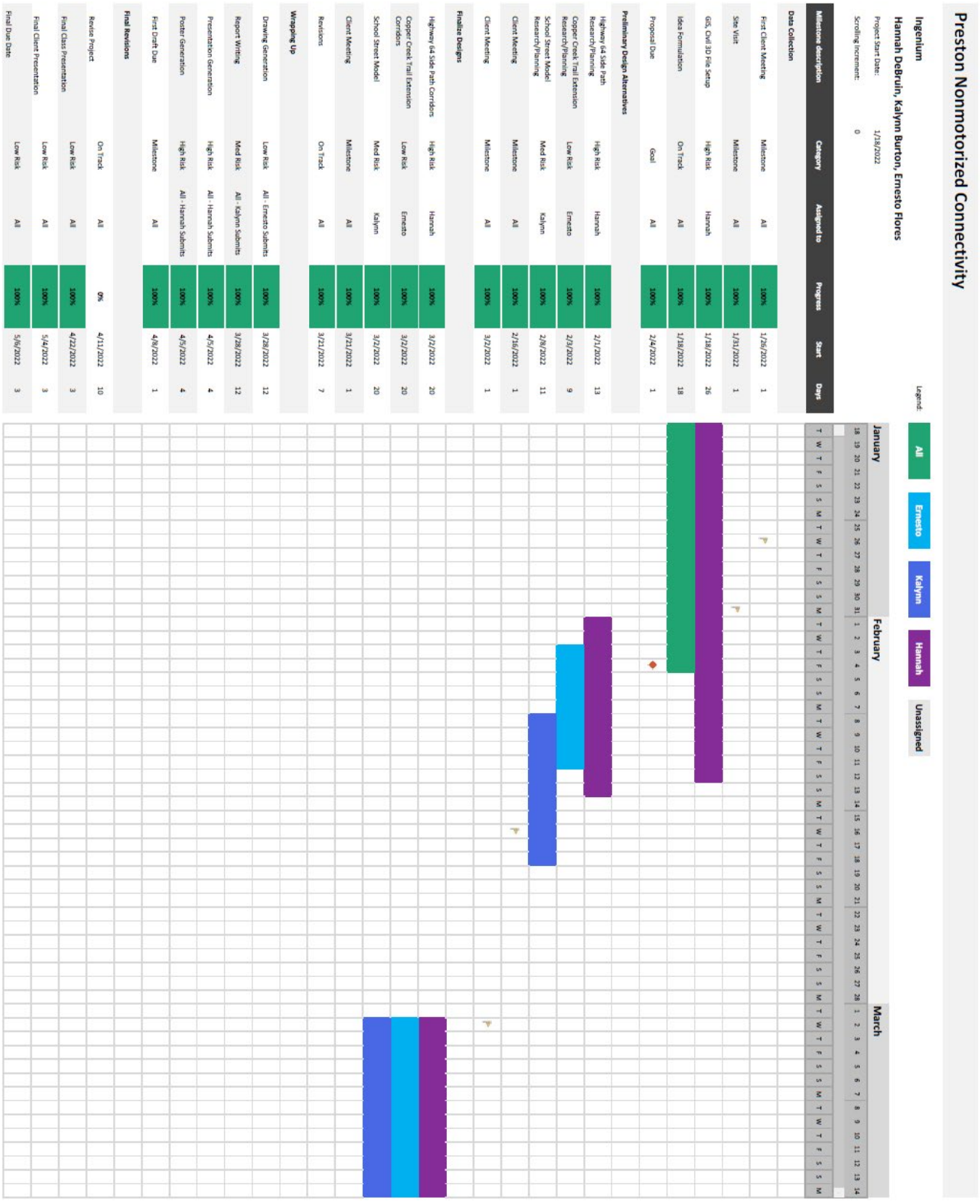
To assist with the financial burden of these projects, we've compiled a list of potential funding sources and important information about the amounts available and application deadlines for each source.

Project Description	**Potential Funding Source**	**Notes**
Highway 64 Crossings	TAP, RCTP	Qualifies as a safe routes to school project
School Street Additional Sidewalks/Introduce pedestrian lane	TAP	Qualifies as a safe routes to school project
(Optional) School Street Pedestrian Lane Mural	Creative Places Project Grant, Strengthening Communities Grant	
Copper Creek Trail extension south to park off Degroat Street	TAP, State Rec Trail Program	Qualifies under 'Recreational Trails Program under Section 206 of Title 23'
New sidewalks along Hope Street	NA	

Highway 64 Side Path out to Dollar General	TAP, RCTP, State Rec Trail Program	

Funding Source Name	**Available Amount/Matching Breakdown**	**Application Deadline(s)**
TAP (Transportation Alternatives Program)	Work with Chandra Ravada, Dan Fox	Work with Chandra Ravada, Dan Fox
RCTP (Rural County Transportation Application)	Maximum $25,000 provided by RCTP, minimum of 20% of project cost needs to be covered by entity	Work with Chandra Ravada, Dan Fox
State Recreational Trail Program	At least 25% matching funds, funds may be granted up to a maximum 80%. Matching funds can't include other grant revenue.	January 2 and July 1 deadlines
Creative Places Project Grant	$500-$2,500 with a 1:1 match requirement	May 2, August 1, November 1, February 1
Strengthening Communities Grant	$10,000-$100,000 with a required 1:1.5 match	November 22, 2021 (has to go through a nonprofit)

Appendix E – Gantt Chart



Preston Nonmotorized Connectivity

Ingenium

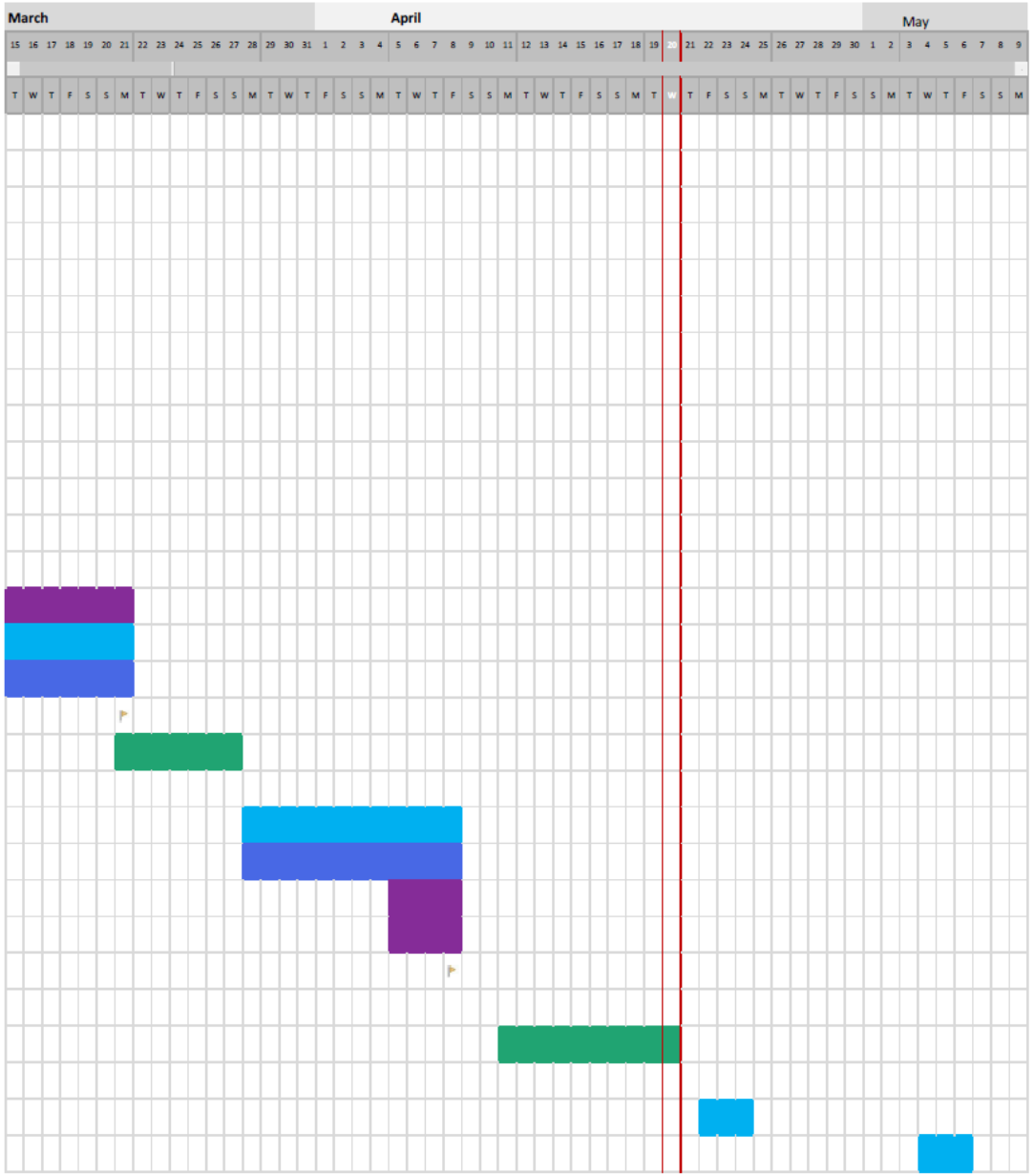
Hannah DeBruin, Kalynn Burton, Ernesto Flores

Project Start Date: 1/18/2022

Scrolling Increment: 56

Legend: All | Ernesto | Kalynn | Hannah | Unassigned

Milestone description	Category	Assigned to	Progress	Start	Days
Data Collection					
First Client Meeting	Milestone	All	100%	1/26/2022	1
Site Visit	Milestone	All	100%	1/31/2022	1
GIS, Civil 3D File Setup	High Risk	Hannah	100%	1/18/2022	26
Idea Formulation	On Track	All	100%	1/18/2022	18
Proposal Due	Goal	All	100%	2/4/2022	1
Preliminary Design Alternatives					
Highway 64 Side Path Research/Planning	High Risk	Hannah	100%	2/1/2022	13
Copper Creek Trail Extension Research/Planning	Low Risk	Ernesto	100%	2/3/2022	9
School Street Model Research/Planning	Med Risk	Kalynn	100%	2/8/2022	11
Client Meeting	Milestone	All	100%	2/16/2022	1
Client Meeting	Milestone	All	100%	3/2/2022	1
Finalize Designs					
Highway 64 Side Path Corridors	High Risk	Hannah	100%	3/2/2022	20
Copper Creek Trail Extension Corridors	Low Risk	Ernesto	100%	3/2/2022	20
School Street Model	Med Risk	Kalynn	100%	3/2/2022	20
Client Meeting	Milestone	All	100%	3/21/2022	1
Revisions	On Track	All	100%	3/21/2022	7
Wrapping Up					
Drawing Generation	Low Risk	All - Ernesto Submits	100%	3/28/2022	12
Report Writing	Med Risk	All - Kalynn Submits	100%	3/28/2022	12
Presentation Generation	High Risk	All - Hannah Submits	100%	4/5/2022	4
Poster Generation	High Risk	All - Hannah Submits	100%	4/5/2022	4
First Draft Due	Milestone	All	100%	4/8/2022	1
Final Revisions					
Revise Project	On Track	All	0%	4/11/2022	10
Final Class Presentation	Low Risk	All	100%	4/22/2022	3
Final Client Presentation	Low Risk	All	100%	5/4/2022	3
Final Due Date	Low Risk	All	100%	5/6/2022	3



Appendix F – Design Calculations

Minimum Radius Calculation for Highway 64 Side Path:

R	27	actual	26.50766	calculated
V	12	mph		
Theta	20	degrees		

U.S. Customary

$$R = \frac{0.067V^2}{\tan\theta}$$

where:

R	=	minimum radius of curvature (ft)
V	=	design speed (mph)
θ	=	lean angle from the vertical (degrees)

From AASHTO Guide for the Development of Bicycle Facilities

Minimum Radius Calculation for Copper Creek Trail Extensions involving Curves:

R	10	actual	6.666667	calculated
V	4	mph		
f	0.16			
e	0			

U.S. Customary

$$R = \frac{V^2}{15\left(\frac{e}{100} + f\right)}$$

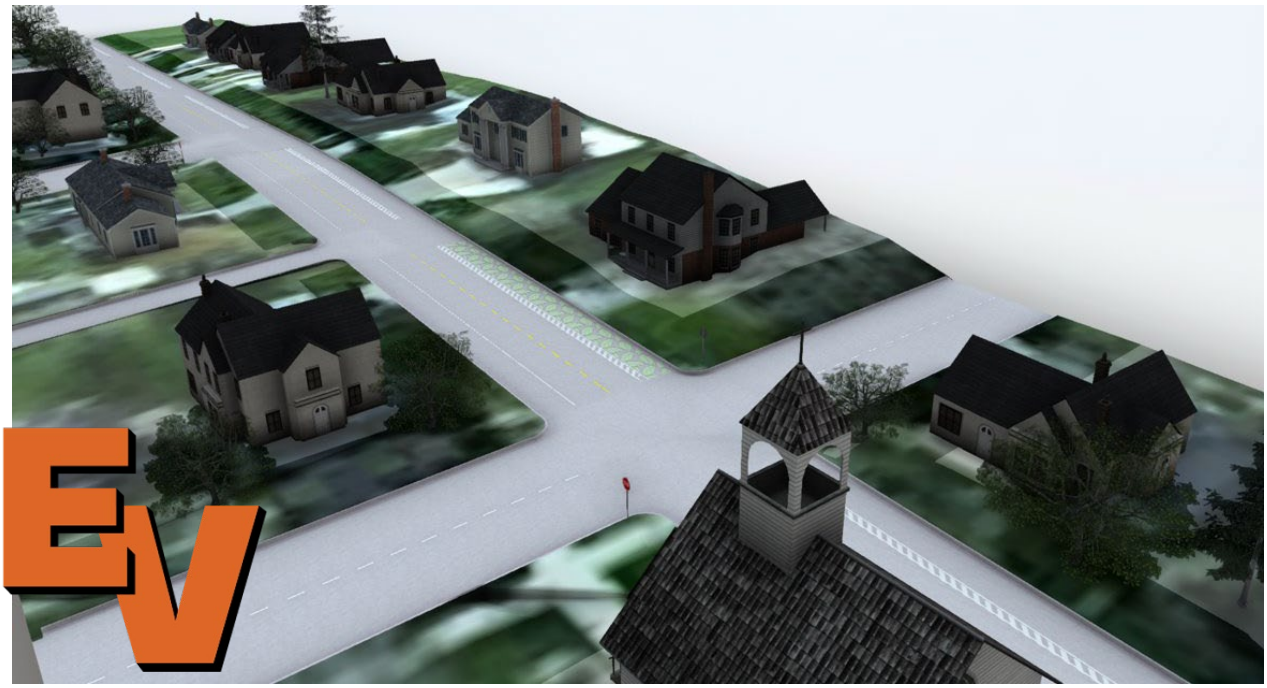
where:

R	=	minimum radius of curvature (ft)
V	=	design speed (mph)
e	=	rate of bikeway superelevation (percent)
f	=	coefficient of friction

Appendix G – Comprehensive Public Art Report

School Street Pedestrian Lane Pavement Mural

Preston, Iowa
Hannah DeBruin
Working in collaboration with Denise Larson
and art students at Easton Valley Junior/High School



Target Audience

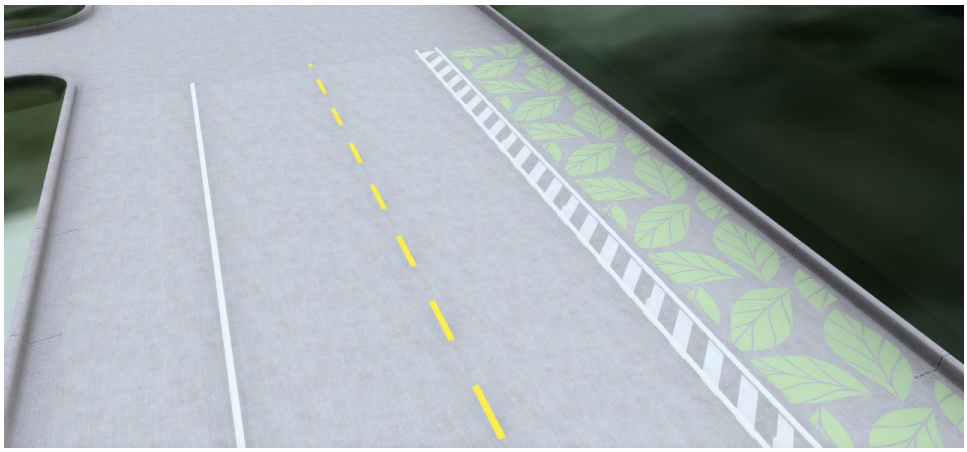
The target audience of this piece is the community of Preston, Iowa and specifically students of the Easton Valley Junior/High School. A sample of these students (those enrolled in an art class) directly contributed to the design of the pavement mural and will continue to help maintain it in future years. The intention of the piece is really to give students some experience with a public art project and pride in their hometown, even as they graduate or move away from the region. The piece also serves as a representation of how Preston prioritizes community and collaboration.

Location

The pavement mural will be on School Street in Preston, on an 8’ wide by 150’ long segment of road (converted into pedestrian lane) directly in front of the school building. It is highlighted in red in the below figure.

Fig. 1: Pavement Mural Location

Fig. 2: Pavement Mural Location on Street



Regulatory Hurdles

The MUTCD guidance website explains that the Manual for Uniform Traffic Control Devices does not directly apply to street artwork. However, if the design impacts traffic safety, the MUTCD recommends against them. Because the pedestrian lane will be delineated with a normal buffer marking and marked with Pedestrians on Roadway and No Parking On Pavement signs, traffic safety concerns should be met. Ultimately, the MUTCD requirements for this project are met, so as long as the design isn't overly reflective or distracting, there shouldn't be any regulatory hurdles.

Fig. 3: MUTCD FAQ about Street Artwork

4. **Q: Does the MUTCD allow intersection murals or widespread application of artwork to the street?**

   A: Exclusive of a crosswalk that may be present, intersection murals and street artwork are not traffic control devices and the MUTCD most likely does not directly apply. Intersection murals and street artwork then become a right-of-way issue. Paragraph (b) of 23 CFR 1.23 provides that all property within the right-of-way boundaries shall be devoted exclusively to public highway purposes. Intersection murals and street artwork have a potential to compromise motorist safety by interfering with, detracting from, or obscuring official traffic control devices. They can also encourage road users—especially bicycles and pedestrians—to directly participate in the design, loiter in the street, or give reason to not vacate the street in an expedient or predictable manner. For these reasons, exceptions for intersection murals and street art are not made in accordance with Paragraph (c) of 23 CFR 1.23.

Approval Process

According to the Preston Code of Ordinances section 3-3-8, the Chief of Police has to approve the designation of the pedestrian lane and any paint markings. Because the pedestrian lane design will also be presented to City Council, the mural will likely go through the normal approval process with public comment and a vote.

Fig. 4: Code of Ordinances Section

3-3-8 CHIEF OF POLICE TO DESIGNATE CROSSWALKS, ESTABLISH, AND MARK TRAFFIC LANES. The Chief of Police is hereby authorized:

1. To designate and maintain by appropriate devices, marks or lines upon the surface of the roadway, crosswalks at intersections where, due to traffic conditions, there is particular danger to pedestrians crossing the street or roadway, and at such other places as traffic conditions require.

2. To mark lanes for traffic on street pavements at such places as traffic conditions require, consistent with the traffic Code of this City. Where traffic lanes have been marked, it shall be unlawful for the operator of any vehicle to fail or refuse to keep such vehicle within the boundaries of a lane except when lawfully passing another vehicle or preparatory to making a lawful turning movement.

3-3-9 PLAY STREETS. The Chief of Police has the authority to declare any street or part thereof a play street and to place appropriate signs or devices in the roadway indicating and helping to protect the same.

Whenever authorized signs are erected indicating any street or part thereof as a play street, no person shall drive a vehicle upon the street or any portion thereof except drivers of vehicles having business or whose residences are within the closed area, and then the driver shall exercise the greatest care in driving upon the street or portion thereof.

Design Renderings

Designs were created by Easton Valley Junior/High School art students, voted upon as a class, and stitched together by teacher Denise Larson. The attached designs aren't final renderings, but solid ideas a group of students will move forward with to finalize and standardize the design.

Fig. 5: Pavement Mural Design to Scale

Fig. 6: Scaled Up for Details – Pavement Mural Designs

Required Materials

After consulting with local muralist Alexandra Hval who has experience with crosswalk painting, several brands of traffic paint were recommended. Three coats of traffic paint and a top epoxy coating with traction beads mixed were recommended as well. A power washer should be used on the site initially. Rollers, brushes, trays, and drop cloths will be the main tools used.

Site Preparation

The site will need traffic control on installation day. Ideally, the lane would already have a painted buffer pedestrian lane when the paint is applied, and vehicles will not be allowed in the space. Temporary traffic cones marking out the space could also function well. A traffic safety official should be assigned on application day to ensure the safety of all participants.

The lane should be power-washed with soap and water for best chance at the paint lasting.

Funding Requirements

Using a conservative coverage estimate of about 100 square feet per gallon of traffic paint for coverage and the recommended three coats of paint for the whole 150’ by 8’ area, about 36 gallons are needed for the project. The following cost estimate for materials was generated:

Table 1: Cost Estimate

Item	Quantity	Cost	Link
Red	2	$729.90	https://www.sherwin-williams.com/painting-contractors/products/propark-waterborne-traffic-marking-paint
White	2	$596.90	https://www.sherwin-williams.com/painting-contractors/products/propark-waterborne-traffic-marking-paint
Black	1	$298.45	https://www.sherwin-williams.com/painting-contractors/products/propark-waterborne-traffic-marking-paint
Blue	1	$364.95	https://www.sherwin-williams.com/painting-contractors/products/propark-waterborne-traffic-marking-paint
Yellow	2	$596.90	https://www.sherwin-williams.com/painting-contractors/products/propark-waterborne-traffic-marking-paint
All Paint	8	$2,587.10	
Rollers	15	$36.60	https://www.menards.com/main/paint/paint-sprayers-applicators/paint-roller-frames/rubberset-reg-9-5-wire-consumer-grade-paint-roller-frame/99073290/p-1444452821653-c-8126.htm?tid=-7867218356265939189&ipos=6
Roller Covers	15	$34.95	https://www.menards.com/main/paint/paint-sprayers-applicators/paint-roller-covers/quick-solutions-trade-9-x-3-8-paint-roller-covers-3-pack/690280400/p-1552890791035-c-8115.htm?tid=4164447381748341978&ipos=3
Roller Tray	15	$49.35	https://www.menards.com/main/paint/paint-sprayers-applicators/paint-trays-buckets/bestt-liebco-reg-9-plastic-dimple-paint-roller-tray/990077199/p-7720120059427842-c-13972.htm?tid=-3550505162780005135&ipos=1
Detail Brushes	15	$79.95	https://www.menards.com/main/paint/paint-sprayers-applicators/paint-brushes/value-painter-paint-brush-set-3-piece/997140900/p-1552890791089-c-8098.htm?tid=495853139589517047 6&ipos=6
Power washer	1	$204.69	https://www.menards.com/main/outdoors/outdoor-power-equipment/pressure-washers/masterforce-reg-2000-psi-1-7-gpm-13-amp-corded-electric-pressure-washer/mfx2u2000/p-7720120058342936-c-10113.htm?tid=245299944709527624 3&ipos=5

Epoxy coating with traction	4	$618.80	https://store.interstateproducts.com/products/Non-Slip-Coatings/Traction-N-More-Epoxy-Based-Master-Kit-Covers-Up-To-300-Sq-Ft-
		$3,611.44	total cost

All design, painting, and maintenance of the pavement mural will be performed by volunteers and high school art classes, lead by teacher Denise Larson, so there are minimal labor costs.

Funding Resources

The pedestrian lane as a whole is eligible funding opportunities focused on transportation as well as funding focused on creative placemaking. The Iowa Department of Cultural Affairs, Iowa DOT, and Eastern Central Intergovernmental Association (ECIA) all provide potential funding for nonmotorized connectivity and creative placemaking efforts. Because School Street is identified as a Safe Routes to School Project with ECIA, the pedestrian lane is eligible for the Transportation Alternatives Program, as well as other funding sources identified in the table below.

Table 2: Funding

Funding Source Name	**Available Amount/Matching Breakdown**	**Application Deadline(s)**
TAP (Transportation Alternatives Program)	Work with Chandra Ravada, Dan Fox	Work with Chandra Ravada, Dan Fox from ECIA
Creative Places Project Grant	$500-$2,500 with a 1:1 match requirement	May 2, August 1, November 1, February 1
Strengthening Communities Grant	$10,000-$100,000 with a required 1:1.5 match	November 22, 2021 (has to go through a nonprofit)

Another potential funding option could include community fundraising through coordination between the school district, the city, and other local community and church organizations.

Engagement Plan

Art classes at Easton Valley Junior/High School used class time April 19 and 20 to develop ideas for the space. The ideas were collected by block period and the final design was combined into one by teacher Denise Larson. The mural will be open to public comment when the city council approves the idea.

Media Campaign Outline

With installation planned in the fall of the first eligible school year, this project would mostly utilize the school district's communications connections to build public awareness. Additionally, the Preston Times Online local newspaper and social media could be used to spread information. The media campaign could have the dual purpose of promoting the artwork as well as educating the public on how to drive or walk on School Street when the pedestrian lane is installed.

Appendix H – Sources

1-Autodesk. *Infraworks 2022*

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