

# Appendix D

## Description of the Proposed Action

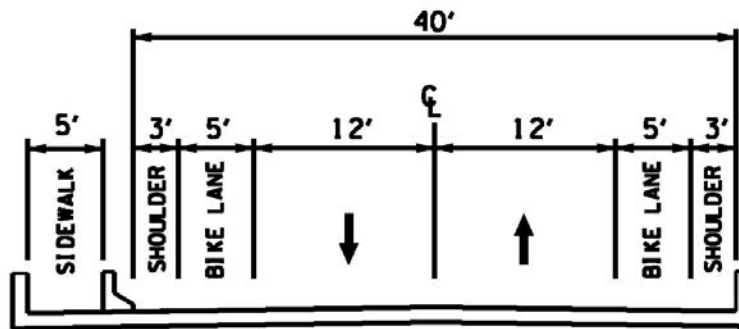
As a design-build project, many of the final design details for the Proposed Action will be determined by the contractor after the project is awarded. Conceptual plans for the alternative are discussed in this appendix to provide a better understanding of the Proposed Action. **Figure D.1** shows the new location alternatives that were considered throughout the alternatives development and evaluation process.

### D.1 Cross-Section

The Proposed Action would provide a 40-foot river crossing, consisting of two 12-foot wide lanes with full 8-foot shoulders. A 5-foot wide sidewalk would be cantilevered off one side of the structure. **Figure D.2** illustrates the cross-section for the river bridge. The 5-foot bike lanes along the roadway are included in the 8-foot wide shoulders.

In the Minimal Approaches scenario, the Superstructure Replacement Alternative includes only the replacement of the existing superstructure with minor approach improvements to transition the widened lanes on the bridge back to the existing lane widths. Other roadways beyond the immediate bridge approaches would retain their existing cross-sectional widths.

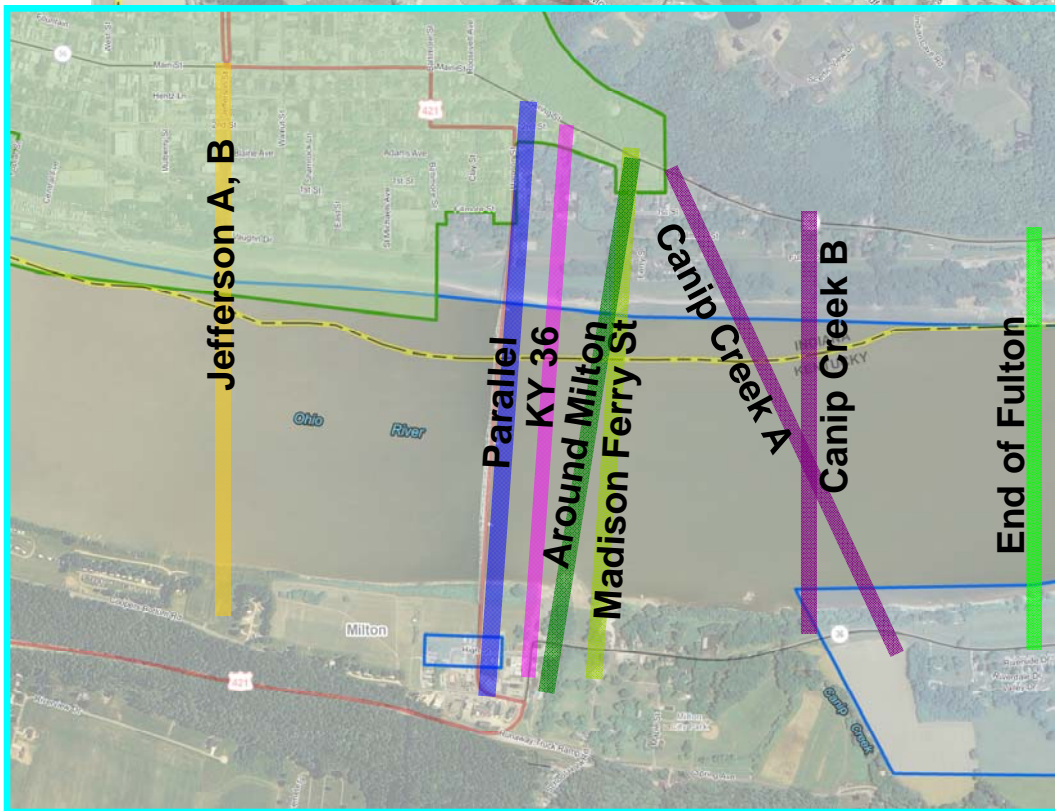
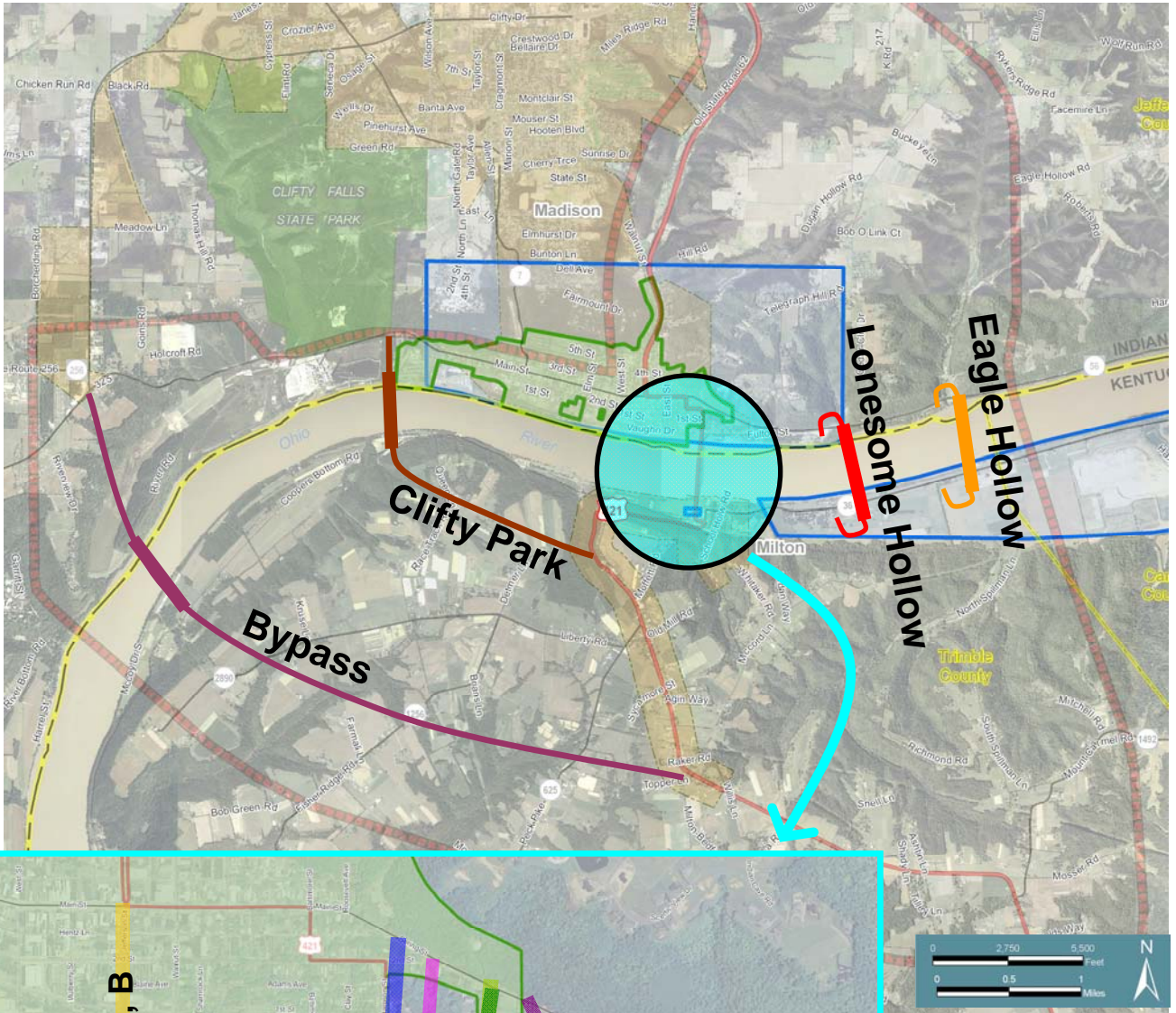
Figure D.2 – Proposed Bridge Cross-Section



### D.2 Strengthening and Widening of the Existing Piers

An investigation undertaken in early 2009 evaluated the condition of the existing river piers to determine the remaining service life. The results of this analysis are detailed in the *Evaluation of Milton Madison Bridge Substructures Report*, published July 2009, and are available on the project website. The evaluation included a hands-on field inspection to document the existing conditions in the field, along with the use of non-destructive testing techniques and the extraction of concrete samples for laboratory testing.

**Figure D.1: Suggested New Location Alternatives**



Results of the field investigation revealed the presence of delaminated areas (a dense outer layer of concrete subject to cracking that is separated from inner layers of concrete by a thin barrier of air or water), cracking, and spalling (cracking resulting from exposure to high temperatures or pressures) in different portions of the pier faces. The average compressive strength was 10,300 psi. Aside from areas experiencing cracking and along liftlines, the concrete was found to be of good quality with an estimated 80-year service life remaining. An area on pier 5 (the river pier nearest the Indiana shore) contains eroded concrete with an exposed section of corroding reinforcing steel.

Based on this pier analysis, the other river piers (piers 6, 7, and 8) could be reused as the substructure for a new river crossing but would require strengthening and widening. Pier 5 is not recommended for reuse and may be eliminated to reduce uplift forces. To ensure the piers are adequate to withstand lateral loads (e.g. wind loadings and barge impacts), the pier foundations would have to be retrofitted. While analysis is still underway to determine the most appropriate mitigation measures, this could include scour mitigations and/or strengthening measures like increasing the size of the foundations or drilling shafts to add stability. The bridge would remain open to traffic throughout the pier mitigation construction activities.

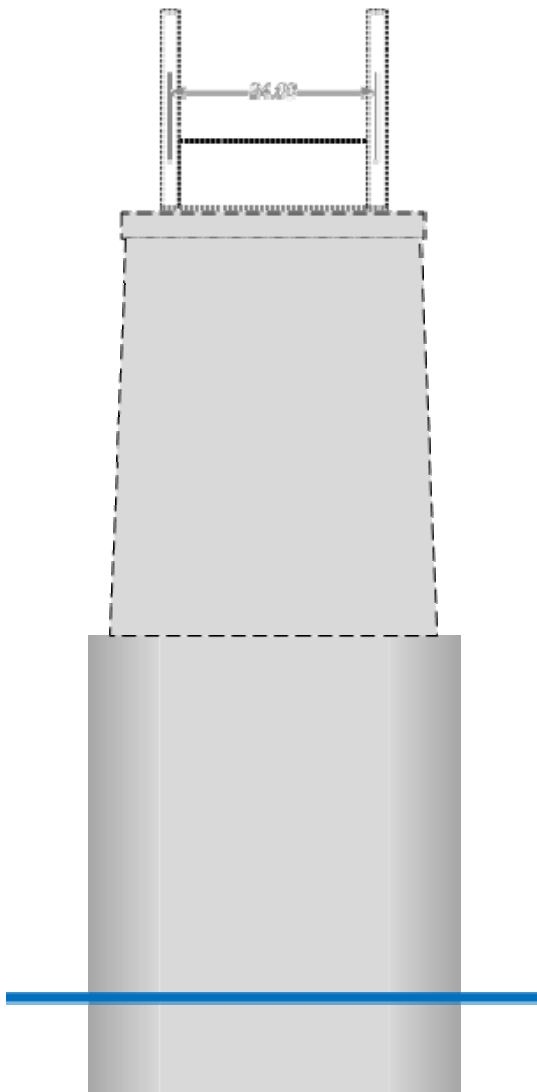
In addition, the existing piers would also need to be widened to support the wider superstructure. Although details will be determined during final design stages, the existing piers would be encased in new concrete that would flare wider at the top than in the current conditions. Preliminary checks of the pier shafts indicate that the section is under reinforced for some of the bending loads and may require additional reinforcement. Pier reconstruction would begin early in the construction sequence, prior to the closure of the bridge, to minimize the length of time the bridge would be closed to traffic. **Figure D.3** shows a conceptual drawing of the necessary pier widening that would be required to support the wider superstructure.

### ***D.3 Demolition of the Existing Superstructure***

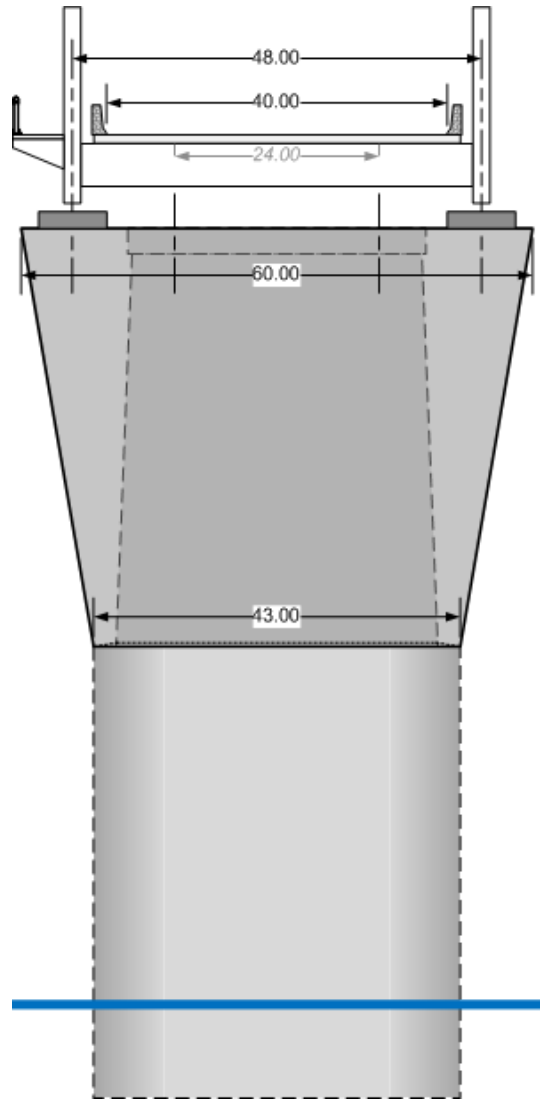
The existing bridge truss would have to be taken down from the piers. Demolition would likely occur using a combination of piece-by-piece removal and explosives to drop parts of the structure into the river. Any pieces dropped should be recovered. Although much of the procedural details would be determined by the contractor, the process would be designed to minimize damage to elements that must be reused, minimize the period of time the bridge must be closed, minimize the period of time the navigational channel must be closed, and comply with navigational requirements established by the US Coast Guard.

Overall, the bridge between the communities would be closed for an estimated 9-12 months for the widening of the pier caps, demolition, and replacement of the superstructure. The prolonged closure could result in economic losses for both communities. The nearest Ohio River Bridge is the Markland Dam, located 26 miles upstream near Markland, Indiana. It is expected that KYTC and INDOT would offer incentives to the contractor to minimize the length of time the bridge is closed.

**Figure D.3**  
Pier Widening Activities



Existing Pier



Proposed  
New Pier

### D.4 Temporary Ferry Service

To maintain travel between the two communities, the project team would provide a ferry service across the river that would operate for the duration of the bridge closure. Although many of the operational details would be arranged by the contractor, the service will run between the boat ramp in Milton east of the bridge the former Ferry Street boat ramp in Madison. **Figure D.4** shows the likely route the ferry service would take.

Figure D.4 –Ferry Routing



Assumptions about the costs, conceptual docking improvements, and capacity are discussed in some detail in **Appendix F** of the project’s EA.

### D.5 Kentucky Approach

The Kentucky approach, illustrated in **Figure D.5**, extends approximately 100 feet from the abutment. An abutment and four new piers would be constructed on the Kentucky shore, replacing the existing piers. The existing clearance over High Street would be preserved.

A sidewalk would be cantilevered to the downstream side of the bridge in this scenario. The sidewalk would cross the river and descend to ground level via a series of ADA-compliant ramps located near the riverfront in Milton, west of the structure. A connection to the east and south would provide connectivity to the sidewalk along Ferry Street.

In this scenario, the bridge remains entirely on state-owned right-of-way although it passes through the Third Street Historic District. Right-of-way impacts, relocations, and other environmental effects to the community and to the Third Street Historic District are discussed in the project’s Environmental Assessment.

### **D.6 Indiana Approach**

The Indiana approach, illustrated in **Figure D.6**, extends approximately 100 feet north from the bridge abutment. A larger abutment and four new piers would be constructed on the Indiana shore, replacing the existing land piers.

A sidewalk would be cantilevered to the downstream side of the bridge in this scenario. The sidewalk would cross the river and run along the western side of the new bridge approach, looping to the west with an ADA-compliant ramp that ties into Vaughn Drive near Jaycee Park in Madison. Alternately, a sidewalk extension could continue north along Harrison Street to connect into the existing sidewalk network there.

The approach encroaches on the Madison Historic District and is adjacent to the National Historic Landmark. However, the bridge and approaches remain entirely within state-owned right-of-way. Additional right-of-way impacts, relocations, and other environmental effects to the community and the Madison Historic District are discussed in the project’s Environmental Assessment.

### **D.7 Renderings and Visualizations**

The following images contain images of the existing bridge side-by-side with renderings of the Proposed Action. As a design-build project, final designs will be developed by the contractor.

Shown in **Figure D.7**, the new bridge would appear wider than the existing; the cross-sectional width of the highway increases from 20 feet to 40 feet in this scenario. A view along the existing truss is shown on the left; the rendering of the proposed bridge is on the right. Although the contractor will determine final design details, the new superstructure would appear less complex than the existing truss.

**Figure D.7 – View along Highway crossing Bridge**



**Figure D.8** shows a comparison of the view towards the bridge from the Madison riverfront. This is a representative illustration of the viewshed from riverfront properties within the National Historic Landmark. The existing bridge is shown on the top; a rendering of the Superstructure Replacement truss is shown on the bottom.

**Figure D.5**  
Kentucky Approach



**Figure D.6**  
Indiana Approach



**Figure D.8 – View from Madison Riverfront**



From this perspective, the differences in the size and complexity between the two structures are less apparent. The viewshed from the National Historic Landmark would be largely unchanged. Modifications to the piers would be visible but the general appearance remains similar to the current arrangement and pier type.

**Figure D.9** shows a comparison of the views from the Milton boat dock, east of the existing bridge. This view also presents historic downtown Madison, visible beyond the structure. The existing bridge is shown on the top; a rendering of the Superstructure Replacement truss is shown on the bottom.

Additional coordination with Section 106 consulting parties and PAG members occurred in December 2009 to identify aesthetic preferences for other features: barrier and railing treatments, the color of the truss, the abutment and pier appearances, etc. These elements will be coordinated throughout the design process to ensure the replacement structure and modified piers fit the historic context of the area.

**Figure D.9 – View from Milton Boat Ramp**

