

# Project Description & Goals

## Project Description:

*The Stonelick-Williams Corner Road Covered Bridge Rehabilitation project proposes improvements to the existing structure to preserve and protect the historic covered bridge and insure the this important Clermont County landmark can continue to safely carry the loads necessary for 21<sup>st</sup> century traffic.*

## Stonelick-Williams Corner Covered Bridge Facts:

- ❖ Built in 1878 the bridge is a Howe Truss and is listed on the National Register of Historic Places
- ❖ The County Engineer has statutory responsibility to maintain County roads and bridges in the safest and best condition possible to accommodate the travelling public
- ❖ Inspection and load rating analysis performed in the fall of 2008 concluded that the current load carrying capacity is three (3) tons and that without significant structural improvements the bridge will eventually need to be closed to vehicle traffic
- ❖ The truss structure, as with all trusses, are prone to failure due to deterioration of the lower chord and panel point connections. Since there is very little redundancy built into the existing design, failures can occur with very little warning and safety of the travelling public is put at risk

## Project Goals:

- ❖ Preserve and protect the historic bridge while maintaining its status on the National Register of Historic Places
- ❖ Adhere to the guidelines established by the National Historic Covered Bridge Preservation Program (NHCBP) and the Federal Highway Administration (FHWA) Covered Bridge Manual
- ❖ Provide structural reinforcement that will allow for a 12 ton load limit (bridges are normally designed for 40 tons) which takes into account the need to restrict heavy truck traffic across the historic structure

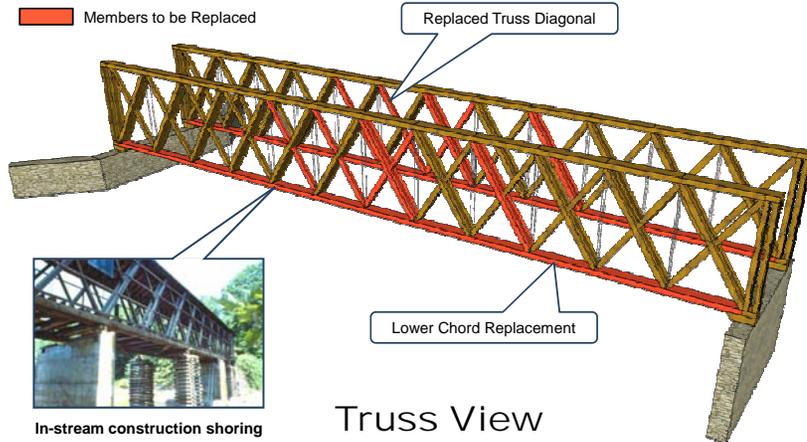
Concern/Comment	Comment Number	Total Number Expressing Concern	Disposition of Comments
<b>Supports Project and Current Design</b>			
Supports rehab and wants increased loading capacity, or bridge replaced with stronger structure to prevent having to detour daily around bridge	10	1	Options 2-5 provide a twelve (12) ton load carrying capacity
<b>Do Not Support Project or Current Design</b>			
Stated that Public Meeting and/or Engineers Office should have presented and considered other alternatives/options and allowed for public input for alternative/option selection, includes request for another public meeting to answer questions	1, 7, 9, 12, 13, 18	6	Agreed.
Stated that project should minimize bridge/road closure time	1, 8	2	Options 1 and 5 have estimated ten (10) month construction time, while Options 2 thru 4 are estimated at twelve (12) months.
Opposes increasing bridge loading capacity. Will increase heavy truck/vehicle traffic and decrease safety, and degrade the nature and character of Stonelick Valley in general	1, 3, 4, 5, 7, 9, 11, 13, 14, 15, 16, 17, 18, 19	14	Option 1 will provide an eight (8) ton capacity and Options 2-5 will provide a twelve (12) ton load capacity. All options will increase safety by providing increased structural integrity to the existing truss, lateral sway bracing, diaphragm bracing, and deck replacement.
Stated that project should restore/preserve/conservate the original design of the bridge with 19th century design elements, and not add to the existing structure (i.e., glue-lam arches). Concern that project could jeopardize NHRP designation	1, 2, 5, 6, 7, 8, 9, 13, 14, 16, 20	11	Option 5 has been approved by the State Historic Preservation Office, the Ohio Department of Transportation, and adheres to the guidelines established by the National Historic Covered Bridge Preservation Program and FHWA's Covered Bridge Manual (Publication No. FHWA-HRT-04-098).
Opposed to traffic signals. Signals will detract from historic character of the bridge, increase travel time, cause unnecessary delay (suggests installation of signal change actuators), may decrease safety and will be aesthetically out of character with historic bridge	1, 5, 11, 14, 17, 18, 19, 20	8	Traffic signals will not be installed as they do not meet the Ohio Manual of Uniform Traffic Control Device signal warrant.
Proposes only considering design to increase loading capacity to 12 tons	3, 15, 20	3	Agreed
Does not support Option 5; too expensive, alters uniqueness and character, unacceptable design, prefers another alternative/option	5, 7, 12, 13, 15, 18	6	Option 5 has been approved by the State Historic Preservation Office, the Ohio Department of Transportation, and adheres to the guidelines established by the National Historic Covered Bridge Preservation Program and FHWA's Covered Bridge Manual (Publication No. FHWA-HRT-04-098). The design employed to develop Option 5 is used throughout the United States and has been recently used in Morgan County, Ohio.
Proposes increasing loading capacity to carry EMS vehicles, only, but not enough to carry heavy trucks/commercial vehicles	8, 19	2	Agreed. The proposed twelve (12) ton load limit for Options 2 thru 5 does not allow for heavy vehicles as displayed for each option.
Proposed that approaches need to be improved for safety	8	1	Federal and State guidelines require that the Covered Bridge rehabilitation project remain on existing alignment. No lane addition/widening is permitted.
Proposes that county acquire right-of-way to build parking lot next to bridge for tourists to stop and take pictures	8	1	Not in project scope.
Feels current design will lead to bridge destruction during next flood event	9, 13	2	Options 4 and 5 lower the bridge profile by approx. 18 inches. However, both options include additional diaphragm bracing, sway bracing, and new floor beams that will provide additional support against debris impact.
Proposes repairs/restoration being done with new materials and technologies	9	1	Need to restore/rehab structure within FHWA Guidelines and the State Historic Preservation Office approval.
Proposes lowering bridge entrance to prevent use by heavy trucks	13, 15	2	Twelve (12) ton load limit does not permit heavy trucks
Questions adequacy of current signage, and/or supports posting of additional signage concerning historic bridge: warning signs at US 50 and/or Craver road restricting use of bridge to cars and pick-ups only, posting of lower speed limit signage prior to bridge approaches, and posting of "One Lane Bridge" signage	9, 13, 14, 15	4	Clermont County will install all signage possible per the Ohio Manual of Uniform Traffic Control Devices to provide advance notice of restricted bridge and to limit the use of the Covered Bridge to twelve (12) tons and under.

# Option No. 1

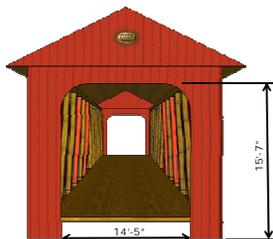
## COMMON TO ALL OPTIONS:

- ✓ Repair of the southeast wingwall and existing mortar joints
- ✓ Replacement of existing bridge lighting
- ✓ Replacement of siding/ roofing
- ✓ Replacement of tension rods and assemblies
- ✓ Replacement of diaphragm bracing
- ✓ Installation of lateral sway bracing
- ✓ Extension of roof overhang
- ✓ Replacement of existing deck.

Members to be Replaced



Truss View



End View

## OPTION 1 DETAILS:

- **50-55% of Historic Truss Remains**
- Complete lower chord replacement.
- Floor System will be replaced with a similar system.
- Diagonals in truss will be replaced as shown below
- Provides a maximum capacity for a single 8 ton vehicle.
- Requires in-stream shoring.
- In-stream construction shoring is needed to support the bridge while replacing structural members and bracing.
- **Temporary shoring is susceptible to wash out during high water events, which would delay construction activities and could lead to loss of the structure during a significant storm event.**
- This option requires replacement of the lower chords, verticals, some truss diagonals (see graphic), and a small portion of the upper chord.
- Temporary wind bracing during construction is needed to stabilize the structure during construction.

## 8 TON LOAD LIMIT

### ALLOWED VEHICLES

✓		1-2 Tons
✓		2-6 Tons
✓		4-8 Tons
X		6-12 Tons (Short Bus)
X		6-12 Tons (Small Truck)
X		13+ Tons

**Construction Time: 10 Months**

### Difficulty of Construction

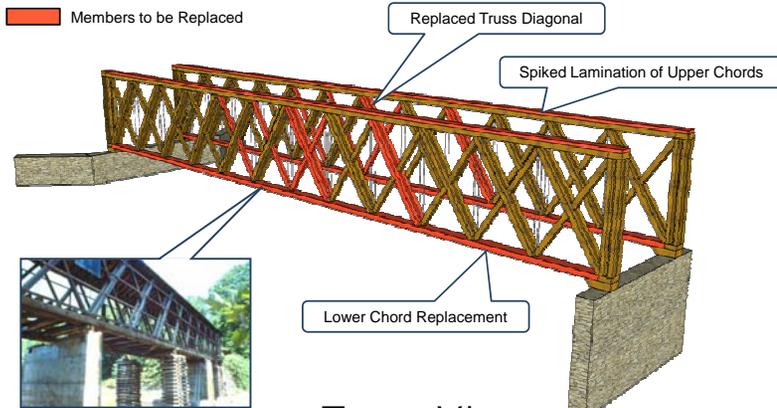


Estimated Construction Cost  
\$717,282.50

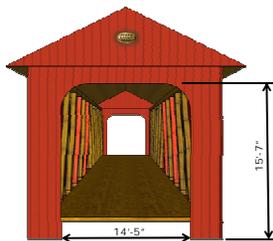
# Option No.2

## COMMON TO ALL OPTIONS:

- ✓ Repair of the southeast wingwall and existing mortar joints
- ✓ Replacement of existing bridge lighting
- ✓ Replacement of siding/ roofing
- ✓ Replacement of tension rods and assemblies
- ✓ Replacement of diaphragm bracing
- ✓ Installation of lateral sway bracing
- ✓ Extension of roof overhang
- ✓ Replacement of existing deck.



Truss View



End View

## OPTION 2 DETAILS:

- **40-45% of Historic Truss Remains**
- Complete lower chord replacement.
- Spike Lamination of Upper Chords.
- Floor System will be replaced with a similar system.
- Diagonals in truss will be replaced as shown below
- Provides a maximum capacity for a single 12 ton vehicle.
- Requires in-stream shoring.
- In-stream construction shoring is needed to support the bridge while replacing structural members and bracing.
- **Temporary shoring is susceptible to wash out during high water events, which would delay construction activities and could lead to loss of the structure during a significant storm event.**
- This option requires replacement of the lower chords, verticals, some truss diagonals (see graphic), and a small portion of the upper chord.
- Temporary wind bracing during construction is needed to stabilize the structure during construction.
- Complete Roof System will need to be replaced.

## 12 TON LOAD LIMIT ALLOWED VEHICLES

✓		1-2 Tons
✓		2-6 Tons
✓		4-8 Tons
✓		6-12 Tons (Short Bus)
✓		6-12 Tons (Small Truck)
X		13+ Tons

**Construction Time: 12 Months**

**Difficulty of Construction**

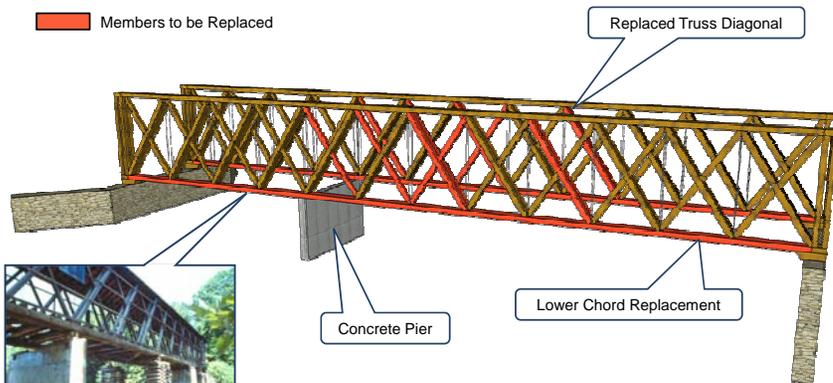
Estimated Construction Cost  
\$836,676.50

# Option No.3

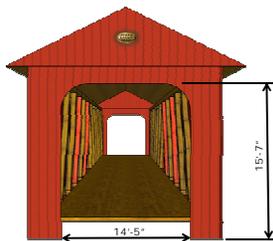
## COMMON TO ALL OPTIONS:

- ✓ Repair of the southeast wingwall and existing mortar joints
- ✓ Replacement of existing bridge lighting
- ✓ Replacement of siding/ roofing
- ✓ Replacement of tension rods and assemblies
- ✓ Replacement of diaphragm bracing
- ✓ Installation of lateral sway bracing
- ✓ Extension of roof overhang
- ✓ Replacement of existing deck.

 Members to be Replaced



Truss View



End View

## OPTION 3 DETAILS:

- **50-55% of Historic Truss Remains**
- Complete lower chord replacement.
- Floor System will be replaced with a similar system.
- Diagonals in truss will be replaced as shown below
- Provides a maximum capacity for a single 12 ton vehicle.
- Requires in-stream shoring.
- In-stream construction shoring is needed to support the bridge while replacing structural members and bracing.
- **Temporary shoring is susceptible to wash out during high water events, which would delay construction activities and could lead to loss of the structure during a significant storm event.**
- This option requires replacement of the lower chords, verticals, some truss diagonals (see graphic), and a pier in the creek to reduce the Trusses span.
- Temporary wind bracing during construction is needed to stabilize the structure during construction.

## 12 TON LOAD LIMIT ALLOWED VEHICLES

✓		1-2 Tons
✓		2-6 Tons
✓		4-8 Tons
✓		6-12 Tons (Short Bus)
✓		6-12 Tons (Small Truck)
X		13+ Tons

**Construction Time: 12 Months**

**Difficulty of Construction**  

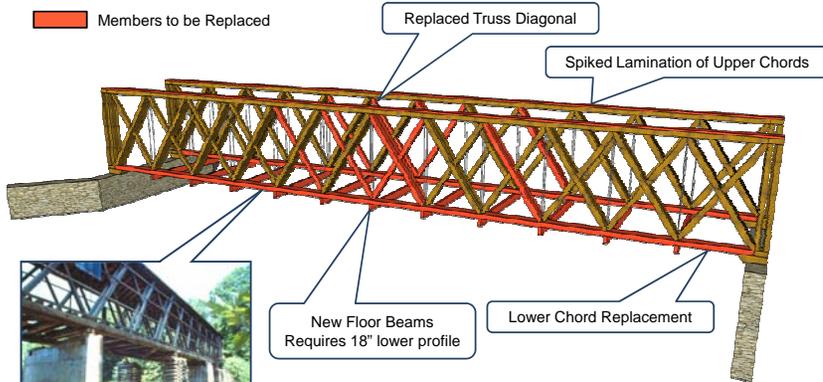

Estimated Construction Cost  
\$859,914.00

# Option No.4

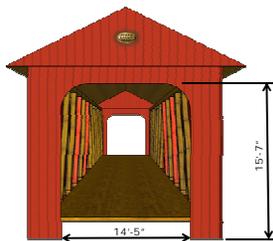
## COMMON TO ALL OPTIONS:

- ✓ Repair of the southeast wingwall and existing mortar joints
- ✓ Replacement of existing bridge lighting
- ✓ Replacement of siding/ roofing
- ✓ Replacement of tension rods and assemblies
- ✓ Replacement of diaphragm bracing
- ✓ Installation of lateral sway bracing
- ✓ Extension of roof overhang
- ✓ Replacement of existing deck.

 Members to be Replaced



Truss View



End View

## OPTION 4 DETAILS:

- **45-50% of Historic Truss Remains**
- Complete lower chord replacement.
- Spike Lamination of Upper Chords.
- Diagonals in truss will be replaced as shown below
- Provides a maximum capacity for a single 12 ton vehicle.
- Requires in-stream shoring.
- In-stream construction shoring is needed to support the bridge while replacing structural members and bracing.
- **Temporary shoring is susceptible to wash out during high water events, which would delay construction activities and could lead to loss of the structure during a significant storm event.**
- This option requires replacement of the lower chords, verticals, some truss diagonals (see graphic), and a small portion of the upper chord.
- Temporary wind bracing during construction is needed to stabilize the structure during construction.
- Lower bottom of Truss 18" due to Floor Beam Replacement.
- Top Chord reinforcement requires significant roof system replacement

## 12 TON LOAD LIMIT ALLOWED VEHICLES

✓		1-2 Tons
✓		2-6 Tons
✓		4-8 Tons
✓		6-12 Tons (Short Bus)
✓		6-12 Tons (Small Truck)
X		13+ Tons

**Construction Time: 12 Months**

### Difficulty of Construction

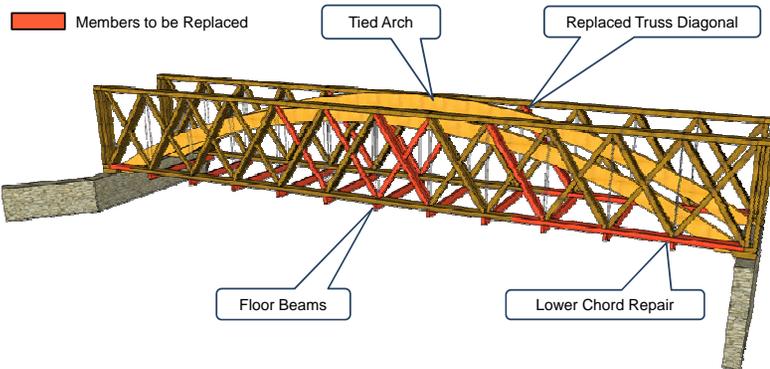


Estimated Construction Cost  
\$783,150.50

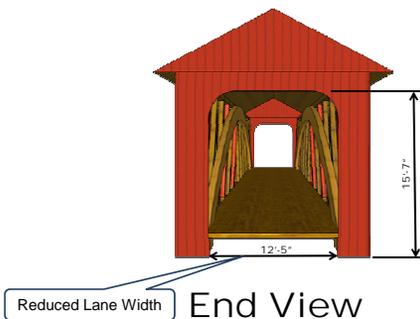
# Option No.5

## COMMON TO ALL OPTIONS:

- ✓ Repair of the southeast wingwall and existing mortar joints
- ✓ Replacement of existing bridge lighting
- ✓ Replacement of siding/ roofing
- ✓ Replacement of tension rods and assemblies
- ✓ Replacement of diaphragm bracing
- ✓ Installation of lateral sway bracing
- ✓ Extension of roof overhang
- ✓ Replacement of existing deck.



Truss View



## OPTION 5 DETAILS:

- **75-80% of Historic Truss Remains**
- Diagonals in truss will be replaced as shown below
- Provides a maximum capacity for a single 12 ton vehicle.
- **No in-stream shoring required.**
- This option requires partial repairs of the lower chords, replacement of verticals, some truss diagonals (see graphic).
- Lower bottom of Truss 18" due to Floor Beam replacement.
- Allows for retention of the majority of the roof system.
- Minimal replacement of timbers due to Arches carrying majority of loads.
- Reduced width of traveling lane. From 14'-5" to approx. 12'-5"
- Results in a structure with a higher factor of safety against critical failure.

## 12 TON LOAD LIMIT ALLOWED VEHICLES

- ✓ 1-2 Tons
- ✓ 2-6 Tons
- ✓ 4-8 Tons
- ✓ 6-12 Tons (Short Bus)
- ✓ 6-12 Tons (Small Truck)
- X 13+ Tons

**Construction Time: 10 Months**

**Difficulty of Construction**

Estimated Construction Cost  
\$1,112,551.00

## Purpose and Need:

The proposed project involves rehabilitation and repairs to the Stonelick Creek Covered Bridge to correct deterioration from use, and structural improvements to increase the existing load capacity from the current posted limit of three tons to a minimum of 12 tons without affecting the bridge's historic significance. The current loading capacity limit of three tons prevents the use of the bridge by emergency services and other heavy trucks must travel circuitous routes in order to provide services to areas on either side of the bridge.

## General Guidelines (Goals)

- Maintain the historical integrity of the bridge

Proposed actions must follow the Secretary of the Interior's Standards for the Treatment of Historic Properties and guidelines established by the National Historic Covered Bridge Preservation Program and FHWA's Covered Bridge Manual (Publication No. FHWA-HRT-04-078).

Proposed work will be reviewed by the State Historic Preservation Office to assure that industry accepted standards and historic preservation guidelines are met.

*The National Historic Covered Bridge Preservation Program allows for the strengthening of historic covered bridges to carry modern traffic.*

- Retain the original bridge features/components to the extent possible
- Maintain the bridge a single-lane facility (no widening or lane addition)
- No added roadway capacity (keep the existing two-lane roadway on existing alignment)
- Minimize impacts to the Stonelick Creek channel and floodplain
- Minimize bridge closure time during construction

## Transportation Need

1. Deteriorating conditions of the existing structure is a safety concern. The current loading capacity limit of three tons prevents the use of the bridge by emergency services and other heavy trucks must travel circuitous routes in order to provide services to areas on either side of the bridge.

2. The existing structure was not designed to carry modern vehicles or high volumes of traffic. Based on inspection and structural analysis, the bridge has a load rating of 3 tons, which means that the current bridge can sufficiently carry vehicles no greater than the size of a SUV.

3. It is the responsibility of the County Engineer to provide safe facilities that accommodate the traveling public, including emergency services and school bus vehicles.

*Option #5*