Brent Spence Bridge
Main River Bridge Structure Type Study
Step 1 – Recommendation Memo

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The objective of Step 1 of the Bridge Type Selection Process was to develop and evaluate approximately 18 preliminary bridge concepts. The preliminary bridge concepts were evaluated through a screening process based on functionality and appearance for the purpose of identifying six concepts for the Step 2 conceptual engineering analysis activities. This memo documents the results of the work completed during Step 1 of the Bridge Type Selection Process and presents the six bridge alternatives recommended for further study in Step 2. Those six alternatives are:

1. Arch Bridge: simply supported arch with inclined arch ribs
2. Arch Bridge: continuous arch with vertical arch ribs
3. Cable-stayed Bridge: two towers, three vertical legs/tower
4. Cable-stayed Bridge: two towers, three inclined legs/tower
5. Cable-stayed Bridge: two towers, two inclined legs/tower
6. Cable-stayed Bridge: one tower, two vertical legs/tower

The basis for this recommendation is described below.

The first activity of the Bridge Type Selection process was a meeting with the Project Aesthetic Committee (PAC). On September 25, 2009, the project team met with the PAC to develop key visual and aesthetic criteria, which would be used to assist with evaluating bridge concepts developed during the Step 1 process. Five key visual and aesthetic criteria were developed as a result of the PAC meeting. The five key criteria were:

1. The new bridge should be visually attractive.
2. The new bridge needs to be visible looking “through” the existing bridge (from the east).
3. As much as possible, crossing the new bridge should allow views of the surrounding context (unlike existing bridge).
4. The new bridge should have distinctive characteristics that identify it as a local landmark.
5. The new bridge should have a visual relationship with the existing bridge.

The project team developed a total of 24 bridge concepts during the Step 1 process. Through a series of design meetings with the Federal Highway Administration (FHWA), Kentucky Transportation Cabinet (KYTC), and Ohio Department of Transportation (ODOT) during Step 1, 12 bridge concepts which met the purpose and needs of the project were identified. These 12 bridge concepts were presented to a combined meeting of the PAC and Project Advisory Committee on January 29, 2010. During this PAC meeting, the project team presented the 12 bridge concepts consisting of two truss bridge, three arch bridges and seven cable-stayed bridges. The project team then solicited feedback from the two committees as to which concepts best met the five key visual and aesthetic criteria. During the meeting, the project team presented various bridge components incorporated into the 12 bridge concepts and requested additional feedback on them to aid in the Step 2 bridge design process. The 12 bridge concepts were posted on the project website to solicit public comment as well.

Prior to the January 29th PAC meeting, a criteria matrix (Attachment A) was developed utilizing the key visual and aesthetic criteria and four additional criteria that were developed

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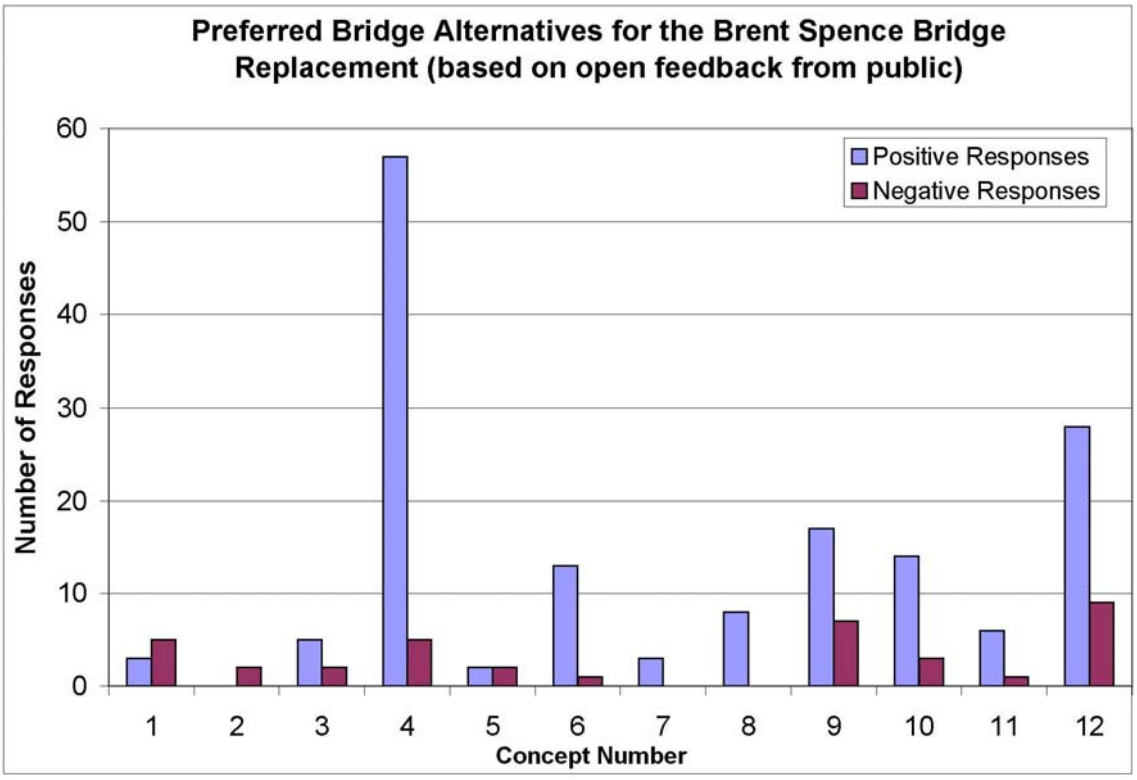
by FHWA, KYTC and ODOT. During the January 29th PAC meeting, the key visual and aesthetic criteria section of the matrix was collaboratively completed by the two committees. The completed criteria matrix can be found in Attachment A. Comments received from the committee members during the meeting were documented and are summarized in Attachment B. Additional comments received from committee members after the meeting, are included in Attachment C.

A one-week comment period followed the January 29th PAC meeting, which provided the public an opportunity to comment on the 12 bridge concepts. Comments were received via email, faxes, phone calls, and postings to the project website. During the public comment period for the 12 Bridge Concepts, PB gathered individual comments either through the project website or via telephone message; those comments are compiled in Attachment D.

The comments were analyzed and used to quantify the trends in the public's preferences and concerns regarding the overall project and the various bridge concepts. Table A is a visual representation of those trends. In order to generate the bar chart in Table A, those comments which liked all or none of the bridge concepts, or which showed no preference (neutral) are not included in the table. In general, up to three positive or three negative comments from each commenter were included in the analysis. Showing a preference for one concept over another was not considered a negative comment for the less preferred concept, unless a specifically negative comment was made about that concept.

The bar chart in Table A provides a clear impression of public opinions on the bridge concepts, and was used as one source of input for PB's recommendation.

Table A



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Based on the results of the January 29th PAC and Project Advisory Committee meeting and the public comments received, the project team developed two options for bridge concepts to be carried forward into Step 2 of the Bridge Type Selection Process. They are noted as Option 1 and Option 2. In each option, the bridge concepts presented in Step 1 have been assigned a Bridge Alternative Number which will be utilized during Step 2.

Option 1:

1. Arch Bridge:
   - Simply supported arch
   - Inclined arch ribs (Concept 4)
2. Arch Bridge: (New concept)
   - Continuous arch
   - Vertical arch ribs
3. Cable-stayed Bridge: two towers, three vertical legs/tower
   - Various stay cable arrangements (developed from Concepts 6 and 7)
4. Cable-stayed Bridge: two towers, three inclined legs/tower
   - Harp stay cable arrangement (Concept 10)
5. Cable-stayed Bridge: two towers, two inclined legs/tower
   - Various stay cable arrangements (developed from Concept 9)
6. Cable-stayed Bridge: one tower, two vertical legs/tower
   - Harp stay cable arrangement (Concept 12)

Alternative:	1	2	3
			
Concept:	4	New	6 and 7

Alternative:	4	5	6
			
Concept:	10	developed from 9	12

Advantages of Option 1:

- Combines popular features from the original 12 concepts, allowing the addition of hybrid alternatives.
- Keeps the most preferred concepts from the PAC meeting.
- Incorporates PAC comments (specifically, the request for more two legs/tower cable-stayed options).
- Provides two arch bridge concepts for consideration.

Disadvantages of Option 1:

- Only four basic different types.

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Option 2:

1. Arch Bridge
   - Simply supported arch
   - Inclined arch ribs (Concept 4)
2. Cable-stayed Bridge: two towers, three vertical legs/tower
   - Various stay cable arrangements (developed from Concepts 6 and 7)
3. Cable-stayed Bridge: two towers, two A-shaped legs/tower
   - Semi-fan stay cable arrangement (Concept 8)
4. Cable-stayed Bridge: two towers, three vertical legs/tower
   - Various stay cable arrangements (Concept 9)
5. Cable-stayed Bridge: two arch-shaped towers
   - Semi-fan stay cable arrangement (Concept 11)
6. Cable-stayed Bridge: one tower, two vertical legs/tower
   - Harp stay cable arrangement (Concept 12)

Alternative:	1	2	3
			
Concept:	4	6 and 7	8

Alternative:	4	5	6
			
Concept:	9	11	12

Advantages of Option 2:

- Includes the preferred concepts from the PAC meeting.
- Includes two concepts which showed some modest support from the general public.
- Six distinct types for selection in the next stage.

Disadvantages of Option 2:

- Not in line with the feedback from the PAC meeting, specifically the strong objections to Concepts 8 and 11 and the request to see more two legs/tower cable stayed options.

As noted above, the design team's recommendation is to proceed with Option 1 as it is in line with the feedback received from the January 29th PAC meeting and from the public's comments.

The design team does not recommend Option 2. As noted above, Option 2 includes Concepts 8 and 11, which received very negative feedback from the PAC and does not include additional two legged tower cable-stayed options, as requested by both the PAC and by members of the public.

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