

Webinar Q&A Documentation
Slide In Bridge Construction (SIBC) from Owner/Policy Maker Perspective - November 21, 2013

No.	Questions Submitted in Advance of Webinar	Q&A Panel Responses
1	<p>Several examples of decision making tools were mentioned in the presentation, can you elaborate on the benefits of some over others? Are some better than others depending on the situation? (Analytical Hierarchy Process [AHP], etc.?)</p>	<p>Response: There are two decision making tools being used. The goal of each is the same; i.e. to help an owner in the decision process using different formats. The decision making framework is a qualitative approach and generally guides a decision maker using the criteria that are common to owners. This tool has three formats – flowchart, matrix, and narratives. The flowchart is an easy read. The matrix is more elaborate with extended questions and the more “yes” you get, the more justified it is to go Accelerated Bridge Construction (ABC). The narratives guide a designer through the consideration of the main key items that might impact a project decision. However, it doesn’t provide a quantitative assessment based on the input provided. When compared between two or more alternatives, the AHP is a better tool. Some managers may want to have quantitative values in addition to the qualitative discussions in the decision results and the AHP will give you that. Another feature I like about the AHP tool is the documentation part. Once one runs the analyses, it produces bar charts and pie charts for the whole package of criteria that are selected early on in setting up the decision making process. The criteria and sub-criteria are quite extensive and most often one can pick and choose the criteria and sub-criteria most relevant to the project.</p>
2	<p>Is the bridge slide method for system moves feasible for implementation in highway bridge replacement projects as a standard business practice and why?</p>	<p>Response: Yes. This is the closest ABC practice to conventional bridge construction. Contractors have access to readily available heavy duty equipment (hydraulic jacks, push-pull force systems, roller bearings or Teflon plates that could be used on temporary falsework). There have been many projects demonstrated successfully which show how practical it is. The SIBC Implementation Guide will discuss the practicality of SIBC and give some cost examples to demonstrate the efficiency of it.</p>

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3	It was mentioned in the beginning of the webinar that there would be a "Slide In Bridge Construction Guide " developed. Can you elaborate more on what the guide will cover and when it will be available for use?	Response: The SIBC guide will demonstrate the advantages of SIBC and document how state and local agencies can implement SIBC in typical bridge replacements as part of their standard business practices. The guide will discuss items for owners to consider for project delivery and implementation, and design and construction methods and details to demonstrate how SIBC has been performed on recent projects. The guide is in Final Revision stage and will be completed by the end of the year. It will be posted on the FHWA website shortly after.
4	As an owner, how can I estimate the project cost of building a bridge using slide-in construction ? How do I estimate the project direct costs, and the indirect cost such as road user costs?	Response: For indirect costs, there are all kinds of tools available. Oregon uses the HYRISK tool for calculating user delay costs. It looks at Detour Mileage Cost (DMC) = Duration * Length Detour (L) * Cost/Length (CpL) *ADT. It is also used to determine incentives/disincentives and bonuses. The StrBENCOST developed as part of the NCHRP project is another one used on the Elkton Project. A suggestion for the direct costs - Develop a regular design engineer's estimate on all bid items for the bridge like for a normal conventional design along with the demolition of the existing bridge. Add the separate items related to the bridge slide-in with a few other items associated with the move in through consultation with the heavy move equipment vendors (like Mommoet, Mega Morgan or Sarens). You can bid those items individually or you can lump sum them into the project for items like construction of the temporary supports for the bridge move, or handling of traffic during the short window when the bridge is actually being moved.

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5	In developing project special provision specifications, how does an owner insure that the project or bridge gets built with quality, and yet has the flexibility to include the contractor's innovation and economy.	<p>Response: The prefabricated elements used in ABC will have improved quality over components constructed on a project site. Contractor's QA/QC plan can be better enforced when the work is off-line and not on the critical path. Owner will continue to implement the QA and testing program. FHWA, AASHTO and the industry have been developing HPC and HPS in the last 20 plus years. We have improved corrosion protection strategies in design and construction specifications. These are a big improvement providing a 100-year life on our bridges using these HPMS and corrosion protection systems. Designs are producing improved durability and performance. Bundling projects is another way to take advantage of the economy of scale. The use of Performance Based Specifications can be used to achieve what the owner wants while allowing maximum flexibility to the designer or contractor. You must determine what is important to you as an owner. Those items that are of utmost importance, safety, durability, seismic response, etc. should be dictated in your design specifications. But be aware that similar to Design-Build type projects, the more you dictate to the designer or contractor the less innovation and potentially higher costs. Also consider liability you will accept for the design and construction if the owner dictates most of the final product.</p>
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6	<p>It appears that most of the projects are completed using design-build. How do you go about doing a design-bid-build for bridge slide-in?</p>	<p>Response: There are at least two ways that one can do a design-bid-build. One is to limit the time the contractor can close the bridge for the move-in and how traffic control is to be managed. This way you focus on “what the owner wants” and let the contractor be responsible for the “how-to” piece. The “what the owner wants” is the things the owner can control before, during and after the move. When you look at a long weekend job, there is no time to do your conventional forming and pouring concrete. One can show how it is expected it to be done using a slide-in method or show them the video as part of the prequalification or prebid meeting. One can consider the pay items separately pertaining to the bridge slide-in method (like jacking/moving the bridge, temporary supports system, separate traffic control items, etc...) or lump sum into the bridge slide-in item. Require the designer to design and detail the plans the way the bridge will be built and allow the contractor an option to build with a different method. If they don't have any preference, they can build what the designer provided.</p>
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No.	Questions Submitted in Q&A or Chat Box During Webinar	Q&A Panel Responses
1	How were the new bridge elements put in place on the temp supports?	Response: The contractor built the bridge on temporary falsework using conventional methods; i.e., lay beams, formed and poured the deck and rails.
2	What about new abutment construction? Is traffic shifted & abutments constructed in stages?	Response: For Bridge Crossing No. 3 - Abutment 1 was supported on spread footings built adjacent to the existing bridge while under traffic. Abutment 4 is a bent cap supported on piles and was also built adjacent to the existing bridge while under traffic.
3	What is the longest integral abutment constructed without an expansion joint for a slide in bridge, any problems noted?	Response: This will take some research, and we will post this response later to avoid any delays.
4	Can you touch on the Liquidated Damages (per-minute) justification? What factors did you use to calculate the amount?	Response: Normally Oregon uses the HYRISK tool for calculating user delay costs which is calculated using Detour Mileage Cost (DMC) = Duration * Length Detour (L) * Cost/Length (CpL) * ADT. It is also used to determine incentives/disincentives and bonuses. The StrBENCOST developed as part of the NCHRP project was used on the Elkton Project. The variables considered in the analysis are average peak-period travel in the work zone in miles per hour; peak-period vehicle-to-crash ratio in the work zone; extra travel time costs; extra accident costs; extra vehicle operating costs; and extra environmental costs. In the case of the Program, the word "extra" refers to additional economic costs imposed as a result of performing the construction activities, versus the costs of standard free-flowing traffic in a normal situation.
5	What are some of the methods for building substructure under existing bridge?	Response: An additional method to construct an abutment under an existing structure is to use a straddle abutment. Install piles outside the existing bridge footprint and then construct an abutment cap spanning the piles.
6	Any good examples of building a bridge using gantry crane with top-down construction method?	Response: Segmental construction uses this method except members of this training project team have not seen one done as a slide-in.
7	What is the longest bridge that has been slid into place to date?	Response: We believe the longest bridge slid into place to date is the Sellwood Bridge in Multnomah County Oregon, approximately 1100 feet.

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8	Have you charted or graphed the savings/advantages e.g. time, money, public impact?	Response: Yes. For more info, here is a link to the report: http://www.fhwa.dot.gov/hfl/summary/or/
9	What things factored into "escalation savings" for OR38?	Response: The savings in construction costs are estimated based on what an additional 12 months of duration would have required in terms of a cost premium to account for rising costs of materials and labor beyond normal inflation (escalation). The estimated cash flows of the project were drawn out an additional year and loaded to match an extended schedule. The cash flows were then adjusted with the new midpoint of construction to calculate the savings based on the historical escalation incurred during the time horizon of construction in relative year of expenditure dollars. Using this method it is estimated that the project had potential cost savings of approximately \$1.596 million (or 3.3% of construction value).
10	Do you see any advantages in using alternative contracting methods(CMGC, D-B) for SIBC?	Response: Yes. The Elkton Project was done as a design-build which was effective and efficient for the contractor; he had full control on the design and construction and worked closely with his design consultant to meet the governing windows for road closure and reopening to traffic. Contractor was able to use innovation to deliver the project ahead of schedule. FHWA has a more detailed write-up on the pros and cons for each contract method.
11	Is the slide-in resource material developed by Utah available?	Response: Yes, it will be posted (final version) on the FHWA website once it has gone through formal publishing. A link to the Guide will also be provided at www.slideinbridgeconstruction.com .
12	Are their monitoring requirements; tensometers, dynamic loads, etc.; for structure components while in transit into position?	Response: For the Elkton Bridges, the contractor submitted elaborated jacking plans and monitored the deflections with basic surveying tools. The span was only supported on two points (simple span) during the move and all the contractor was required to show was that the deck concrete was not going to crack. For the Sellwood Bridge move which was more complicated and required differential movements, they used strain gages, laser levels and prisms to monitor the differential limits.