

## ABC Innovative Projects

<b>I-15 / Layton Parkway Bridge</b>					
<b>Location</b>	Over I-15 in the city of Layton in Davis County, north of Salt Lake City				
<b>State</b>	Utah				
<b>Owner</b>	State				
<b>Year Built</b>	2010				
<b>State ID #</b>	S-15-8(211)332				
<b>NBI #</b>	1C1006				
<b>Coordinates</b>	<b>Latitude:</b>	41.056111	<b>Longitude:</b>	-111.960833	
<b>Contact Person</b>	Carmen Swanwick, P.E. Chief Structural Engineer Utah Department of Transportation Phone: 801-965-4981 Email: cswanwick@utah.gov				
<b>Mobility Impact Time</b>	<b>ABC:</b>	Overnight closure of I-15 for each span launch	<b>Conventional:</b>	6 to 12 months of I-15 traffic impacts	
<b>Impact Category</b>	<b>Tier 1</b>	<b>Tier 2</b>	<b>Tier 3</b>	<b>Tier 4</b>	<b>Tier 5</b>
	X				
<b>Primary Driver(s)</b>	reduced onsite construction time; reduced traffic impacts; improved work-zone safety; improved site constructability; improved material quality and product durability				
<b>Description</b>	<ul style="list-style-type: none"> <li>• 217.8-ft long and 134.3-ft wide two-span steel girder bridge longitudinal launch; 1,050-ton 108.8-ft-long span self-weight, 1,050-ton 106.0-ft-long span self-weight</li> <li>• Urban location</li> <li>• Average Daily Traffic count: 92,900 (I-15, 2008)</li> <li>• Traffic management alternative, if constructed conventionally: On I-15, provide traffic detours from northbound to southbound and southbound to northbound for all lanes during bridge superstructure construction. This would mean providing two lanes of traffic for both northbound and southbound during most of the superstructure construction, with further reduction in traffic lanes during critical components of bridge construction.</li> </ul> <p><b>New Bridge:</b> This new bridge was part of the South Layton Interchange Project that replaced a half interchange and flyover with a Single Point Urban Interchange. The project also included replacing an at-grade railroad crossing with a single-span bridge on Layton Parkway a short distance from this bridge.</p> <p>This bridge has two 12-ft-wide traffic lanes and a 15-ft-wide turn lane in each direction, an 8-ft-wide sidewalk and 17-ft-wide shoulder on one side, and a 9-ft-wide bike lane and 13.75-ft-wide shoulder on the other side. The cross-section consists of 12 steel plate girders at 11.67-ft spacing and six flared girders per span, with 9-inch-thick cast-in-place lightweight concrete deck.</p> <p><b>Construction Methods:</b> The ends of the bridge were supported on integral abutments with wrap around 2-stage MSE walls on footings supported by driven piles. The interior support was constructed conventionally. The vertical profile of the bridge was raised 29 ft to lift Layton Parkway over the railroad tracks at the new single-span bridge a short distance away. Poor soil</p>				

conditions at the project site required that 13 ft of surcharge be placed to expedite settlement of new embankments.

The contract required the contractor to limit construction impacts to the traveling public on I-15. To minimize construction activities over I-15, each superstructure span was constructed behind the permanent abutments. The temporary supports for the spans were built high because of the 29-ft-high surcharge placed behind the abutments. Once settlement had occurred and the surcharge was removed, each span was lowered to finished grade using self-climbing jacks. The span was lowered onto a skid beam at the rear end and sliding pads placed on top of slide shoe at forward end.

For the first span launch, the southbound lanes of I-15 were closed in several steps beginning at 7 pm on a Saturday in August, with complete closure of all southbound lanes reached by 11 pm. The west span was then longitudinally launched / slid over I-15 to its final location using large hydraulic rams. The lanes were opened again at 4 am Sunday.

Two weeks later, the northbound lanes of I-15 were closed in several steps beginning at 8 pm on Saturday, with complete closure of all northbound lanes reached by midnight. The east span was then longitudinally launched / slid over I-15 to its final location using large hydraulic rams. The lanes were opened again at 6 am Sunday.

A closure joint over the interior support was placed to tie the two spans together and make the superstructure continuous for live load.

A half-inch-thick polymer overlay was placed to provide a skid resistant long lasting wearing surface and protective system for the bridge deck.

A travel lane interruption disincentive was established to ensure timely construction. Notice to proceed was given in August 2009, and substantial completion was in November 2010.

**Stakeholder Feedback:**  
The ABC method was perceived by owner, designer, and contractor as successful and most likely would be considered for future projects.

**High Performance Materials**

- Lightweight concrete deck

**Photos**



[Additional photos](#)

**Project Planning**

<b>Decision-Making Tools</b>	<i>Site Procurement</i>	<b>Project Delivery</b>	<b>Contracting</b>
<ul style="list-style-type: none"> <li>• State process</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Design-build</li> </ul>	<ul style="list-style-type: none"> <li>• Incentive/disincentive clauses</li> </ul>

**Geotechnical Solutions**

<i>Foundations &amp; Walls</i>	<b>Rapid Embankment</b>
<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Embankment surcharge</li> </ul>

**Structural**

<b>Prefabricated Bridge Elements &amp; Systems</b>	<b>Construction</b>
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<b>Solutions</b>	<b>Elements</b>	<b>Systems</b>	<b>Miscellaneous</b>	<ul style="list-style-type: none"> <li>• Longitudinal skids</li> </ul>
	<ul style="list-style-type: none"> <li>• MSE walls</li> </ul>	<ul style="list-style-type: none"> <li>• Full-width beam span with deck</li> </ul>	<ul style="list-style-type: none"> <li>• CIP reinforced concrete closure joints</li> <li>• Thin-bonded epoxy overlay</li> <li>• LWC deck</li> </ul>	
<b>Costs</b>	\$ 9.3 million construction cost. The contractor priced the risk and staff hours into the bid for accelerated construction. The estimated cost of accelerated techniques was approximately \$1.3 million.			
<b>Funding</b>	<i>Federal only</i>	<b>State only</b>	<i>Federal and State</i>	<i>Other</i>
		X		
<b>Incentive Program (\$)</b>	<i>Highways for LIFE</i>	<i>IBRD</i>	<i>SHRP2</i>	<i>Other</i>
<b>Contract Plans</b>	<b>Complete Set:</b>	<a href="#">As-Built-Permanent Structure</a> (link to pdf)	<b>ABC *:</b>	<a href="#">As-Built-Temporary Structure</a> (link to pdf) <a href="#">Move Monitoring Plan</a> (link to pdf)
<b>Specifications</b>	<b>Complete Set:</b>	Not available.	<b>ABC *:</b>	
<b>Bid Tabs</b>	Not available.			
<b>Schedule</b>	<b>Engineer's:</b>	<a href="#">Approx Des/Constr Schedule</a> (link to pdf)	<b>Actual:</b>	
<b>Other Related Information</b>	<a href="http://www.youtube.com/watch?v=7ezy0Gk5QT0">UTUBE video</a> [http://www.youtube.com/watch?v=7ezy0Gk5QT0] <a href="http://www.udot.utah.gov">UDOT ABC website</a> [http://www.udot.utah.gov (Inside UDOT / Project Development / Structures Design and Bridge Operations / ABC)]			
<b>Photo Credits</b>	Utah Department of Transportation			

\* Specific to the ABC used in the project.