



Washington State
Department of Transportation

SR 520 Bridge Replacement and HOV Program



March 2015

Pontoon construction complete for new floating bridge

Building a safer SR 520 floating bridge

The existing, four-lane SR 520 floating bridge on Lake Washington is vulnerable to windstorms. Studies show the aging bridge could break apart in a severe storm. Moreover, without shoulders or lanes for carpools and transit, the cross-lake bridge creates daily delays for commuters. Now more than 50 years old, the bridge needs to be replaced.

As part of the SR 520 Bridge Replacement and HOV Program, WSDOT is building a new, six-lane floating bridge – one that can move more people more reliably and withstand stronger windstorms and waves.

The backbone of the new bridge is its pontoons – 77 massive, concrete structures that will keep the new, wider bridge stable and afloat.



SR 520 pontoon and floating bridge construction sites



An aerial view (top) of pontoons under construction at the Grays Harbor casting facility; an ironworker (lower-left), perched three stories above the concrete floor of a pontoon, fastens rebar for the pontoon's wall; a 75-foot-wide pontoon (lower-right) squeezes through the Hiram M. Chittenden Locks in Seattle.

Crews wrap up pontoon construction in March 2015

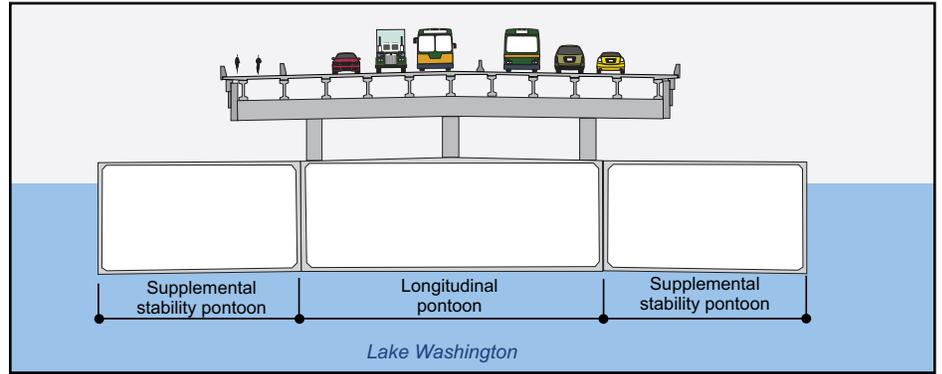
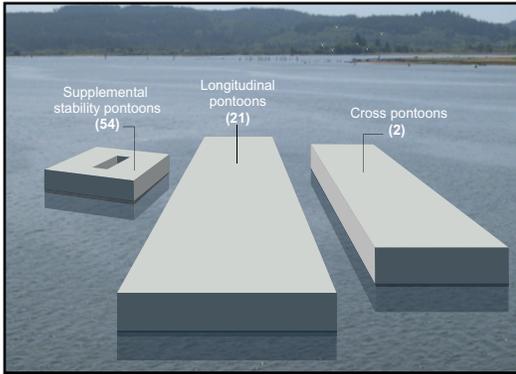
The effort to build pontoons for the new, 1.4-mile-long floating bridge began in early 2011 with the construction of a new casting facility in Aberdeen. Late that year, crews started building the first of 33 pontoons to be built in Grays Harbor. Construction of the bridge's 44 other pontoons also began in late 2011 at a facility at the Port of Tacoma, and wrapped up there in late 2014.

Built in cycles of six to eight pontoons at a time, the first completed cycles floated out of the Aberdeen and Tacoma casting basins in mid-2012. At the peak of construction, more than 650 workers – steelworkers, carpenters, concrete specialists, welders, crane operators, and others – were on the job building pontoons between the two locations.

In mid-2014, crews on Lake Washington began aligning and joining the immense, longitudinal pontoons – using 80 bolts, each up to 20 feet long and 800 pounds, to fasten each pontoon joint. As of March 2015, nearly two-thirds of the pontoons had been joined and anchored in their final positions on the lake. All 77 pontoons are scheduled to be aligned and joined by the end of 2015. The new floating bridge is expected to open to traffic in spring 2016.

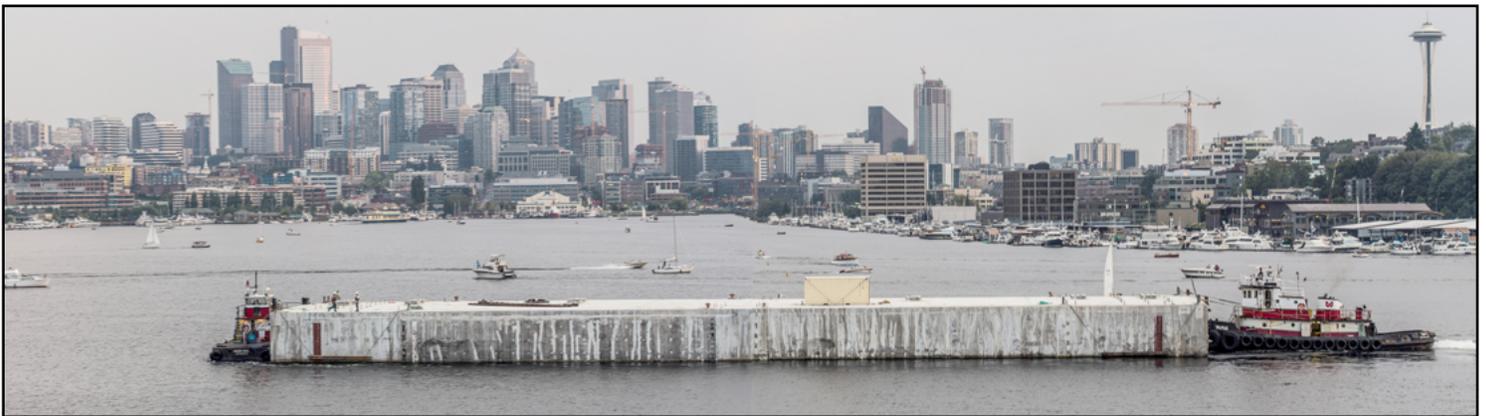
Pontoons – the foundation of a floating bridge

Bridge pontoons are the foundation of a floating bridge. These massive, hollow, concrete boxes are designed to support the weight of the road and the cars, trucks, buses, bicyclists and pedestrians that will use the bridge every day. The largest, longitudinal pontoons for the SR 520 bridge, all built in Aberdeen, are 360 feet long – as long as a football field. Each one weighs a little more than 11,000 tons – roughly equal to 23 Boeing 747 jets. Constructing all 21 of these jumbo pontoons required 112,000 cubic yards of concrete, 35,000 tons of steel rebar, and 2.7 million square feet of plywood formwork. The bridge's 54 supplemental stability pontoons, roughly one-third of the size of the larger pontoons, give the bridge added stability and flotation.



A pontoon's voyage to Lake Washington

After each cycle of concrete and steel pontoons was constructed in one of the two water-free casting basins, large gates opened to flood the basin. The pontoons – usually six or eight in a cycle – were then floated and towed out, either into the Chehalis River or Commencement Bay. Inspectors then thoroughly examine each pontoon, inside and out – even underwater – to ensure it meets the bridge's 75-year design standard. Finally, the pontoons were towed, by tugboat, to Lake Washington. Depending on ocean conditions, the 260-nautical-mile journey from Grays Harbor to Lake Washington took about four or five days. The shorter trip from Tacoma took less than a day.



An Aberdeen-built longitudinal pontoon, guided by tugboats, crosses Lake Union en route to Lake Washington.

For more information

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SR 520 Program Website:
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