



FOR COUNCIL MEETING OF: October 25, 2010
AGENDA ITEM NO.: 8 (a)

TO: MAYOR AND CITY COUNCIL
THROUGH:  LINDA NORRIS, CITY MANAGER
FROM:  RICK L. SCOTT, DIRECTOR
URBAN DEVELOPMENT DEPARTMENT
SUBJECT: PUBLIC HEARING: MINTO ISLAND BICYCLE AND
PEDESTRIAN BRIDGE – NEXT STEPS

ISSUE:

Staff is seeking direction from the City Council on how to proceed with the Minto Island Pedestrian Bridge across the Willamette River Slough.

RECOMMENDATION:

Council consideration.

BACKGROUND:

On October 11, 2010, Council directed staff to hold a public hearing regarding next steps to pursue a bridge connecting Minto Island and Riverfront Park. Tonight Council will hear a presentation by OBEC Consulting Engineers on strategies for navigating the US Coast Guard permit process.

As previously directed by Council on March 23, 2009, staff met with the owners of the Willamette Queen to negotiate a strategy and offset the potential business losses from the reduction in navigability up the Willamette Slough should the City decide to place a low tied arch bridge that could restrict access. The City's offer in respect to the owner's loss of access to the Slough was not accepted and the negotiation was not successful.

Staff has subsequently contacted the US Coast Guard to get a better sense of their position on the proposed low tied arch bridge. The Coast Guard made it clear they would not make a definitive decision without a formal application, but indicated a bridge permit for the low level tied arch Bridge will likely not be issued if it will impede commercial traffic on the Slough. The US Coast Guard indicated they will seek input from the owner of the Willamette Queen for any permit application to span the Willamette Slough.

FACTS AND FINDINGS:

Staff requested OBEC Consulting Engineers (OBEC) produce additional information on the impacts and associated cost of a higher bridge (Attachment A).

On October 11, 2011, the owner of the Willamette Queen submitted the *Certificate of Inspection* from the US Coast Guard (Attachment B). This certificate outlines the route and conditions of operation for the Willamette Queen. OBEC engineering reviewed this document and determined that the conditions of operation would not alter the information in the technical memorandum.

Union Street Railroad Bridge – Existing River Control

The Union Street Railroad Bridge has been permanently modified into a fixed span structure under a permit from the US Coast Guard. The Willamette Queen, with stacks down, has river navigability under the Bridge, on average, 80 percent of the year.

L-1 – Low Tied Arch (Council Approved)

This option would place the 600 foot long tied arch bridge one foot above the 100 year flood height at 144.7 feet and would effectively eliminate the Willamette Queen's use of the slough. The Willamette Queen would have river navigability below the Union Street Railroad Bridge on average 80 percent of the year. This option would have the least spatial impact on Riverfront Park and Minto Island. Project planning cost estimate: \$5,618,000.

H-1 – High Tied Arch

This option would place the 1,030 foot long tied arch bridge 12 feet above the 100 year flood height at 156 feet. The Willamette Queen, with stacks down, would have river and slough navigability on average 92 percent of the year. This option would have a greater spatial impact on Riverfront Park and Minto Island. Project planning cost estimate: \$8,327,000.

H-1 + 6' – High Tied Arch +6'

This option would place the 1,250 foot long tied arch bridge 18 feet above the 100 year flood height at 162 feet. The Willamette Queen, with stacks down, would have river and slough navigability on average 98 percent of the year. With stacks up, navigability for the Willamette Queen would be similar to option H-1. This option would have an even greater spatial impact on Riverfront Park and Minto Island. Project planning cost estimate: \$9,713,000.

H-1 + 11'– High Tied Arch +11'

This option would place the 1,520 foot long tied arch bridge 23 feet above the 100 year flood height at 167 feet. The Willamette Queen, with stacks down, would have river and slough navigability on average 99 percent of the year. With stacks up, navigability would be similar to the H-1+6' option, on average 98 percent of the year. This option would have the greatest spatial impact on Riverfront Park and Minto Island. Project planning cost estimate: \$11,414,000.

Key to continued progress on the Bridge is the successful application for a US Coast Guard permit. With each increase in Bridge height, the likelihood of obtaining a US Coast Guard permit increases; however, the cost and impact on Riverfront Park and Minto Island are increased correspondingly.

Next Steps

Staff is seeking Council direction on how to proceed with the Minto Island Bridge crossing. The following options are provided to Council for consideration.

Option 1: Proceed with the low level Bridge – Proceed with the low level tied arch bridge application for a permit from the US Coast Guard.

Option 2: Change approved design to higher level Bridge – Choose a higher level tied arch bridge to present for a US Coast Guard permit based on similar clearance criteria used for the Union Street Railroad Bridge.

Option 3: Re-enter Negotiations – Return to the owner of the Willamette Queen to discuss new bridge information seeking their response, and provide an adjusted offer for their consideration with the goal of an agreeable strategy.

ATTACHMENT A: OBEC Consulting Engineers Technical Memorandum

ATTACHMENT B: Certificate of Inspection for the Willamette Queen

Report Prepared by: Todd Klocke, Project Coordinator, Urban Development Department
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OBEC CONSULTING ENGINEERS PROJECT TECHNICAL MEMORANDUM

Project No.: 298-7.2

Date: Sept. 28, 2010

Designer: Gary Rayor, PE, SE

Reviewer: John Kalveleg, PE

Project: Minto-Brown Island Pedestrian/Bicycle Bridge

RE: Navigation under Proposed Bridge Alternatives

To: City of Salem

Introduction

The City of Salem is planning a pedestrian bridge connection from downtown Salem and Riverfront Park to Minto-Brown Island. The proposed bridge would span Willamette Slough between Riverfront Park and Minto-Brown Island upstream from the confluence of Willamette River and Willamette Slough.

The City of Salem (City) has retained OBEC Consulting Engineers (OBEC) to study preliminary bridge concepts for this project. The City has also requested a navigation study for four arch bridge alternatives of varying height above the slough; the four alternatives are as follows:

- Alternative L-1: Low-level pedestrian arch bridge (bottom of deck El. 144.7) clear-spanning Willamette Slough and providing clearance for smaller recreational boating and 100-year high water (this option previously approved by City Council on March 23, 2009)
- Alternative H-1: High-level pedestrian bridge (bottom of deck El. 156.0) clear-spanning Willamette Slough and providing incremental navigational clearance improvement for the Willamette Queen Sternwheeler
- Alternative H-1 + 6 feet: Higher-level pedestrian bridge (bottom of deck El. 162.0) clear-spanning Willamette Slough and providing incremental navigational clearance improvement for the Willamette Queen Sternwheeler
- Alternative H-1 + 11 feet: Highest-level pedestrian bridge (bottom of deck El. 167.0) clear-spanning Willamette Slough and providing incremental navigational clearance improvement for the Willamette Queen Sternwheeler

Background

The Minto-Brown Island Bicycle and Pedestrian Bridge has been a goal of the community for more than three decades. This new footbridge would connect Minto-Brown Island Park with

Riverfront Park and downtown Salem. The roughly 350-foot-long main span bridge, with approach ramps as required, would be constructed for pedestrian and bicycle use, and span the Willamette Slough from the south end of Riverfront Park to the north end of Minto Island. The bridge is identified as a project in the Riverfront-Downtown Urban Renewal Plan, the Salem Transportation System Plan, and the Salem Comprehensive Park System Master Plan. The bridge is also a City Council goal and is included as an important connectivity element in the Salem Vision 2020 Action Plan.

Previous Studies

OBEC prepared a Final Bridge Concept Study for Minto-Brown Island Pedestrian Bridge on August 29, 2008. Most of the data used in this memorandum is derived from that report. At the City's request, one change has been made from the 2008 report: modify Alternative H-1 to provide high water navigation for the entire width of Willamette Slough rather than only for the apparent navigation channel on the west side of the slough. Therefore, in this memorandum the cost of the alternative has been adjusted to reflect the change.

Willamette Queen Sternwheeler

Currently, the Willamette Queen uses Willamette Slough for excursions only during the winter when adequate water flow in the Willamette River allows backwater into the slough. The City provided the following information regarding the sternwheeler for use in this study:

- Minimum draft: 3.5 feet
- Minimum river flow to use Willamette Slough: 20,000 cubic feet/second (cfs) in main stem Willamette River
- Sternwheeler height above water with stacks raised: 38 feet; height above water with stacks lowered: 33 feet

The bottom of the high-level crossing will be set to accommodate the sternwheeler at most average winter flows. This is discussed in more detail in the hydraulic section of this study.

U.S. Coast Guard Permitting

A U.S. Coast Guard (USCG) Navigation Permit is required for this project. Generally, the City must follow the application process for a bridge that affects navigation; the USGC notifies mariners of the proposed changes in navigability during a public notification period. It is understood that the operator of the sternwheeler boat is opposed to a reduction in navigability. The purpose of this memorandum is to quantify the reduction in navigability of the bridge alternatives so the information can be used in a formal permit application.

Union Street Railroad Pedestrian/Bicycle Bridge

The former Union Pacific Railroad (RR) Bridge, located downstream from the proposed pedestrian bridge at River Mile 83.9, has been modified by the City into a pedestrian/bicycle bridge. The lift span of the existing bridge has been permanently modified into a fixed-span structure. The USCG permit for this project indicates that the bottom of the bridge in the main

channel is at El. 150.9, which corresponds to the bridge modification design drawings corrected to USCG, U.S. Army Corps of Engineers (ACOE), and Federal Emergency Management Agency (FEMA) flood data datum (NGVD29).

The approved USCG permit for this project was based on a 34-foot clearance under the Union Street Pedestrian/Bicycle RR Bridge (low stack plus 1 foot clearance), the maximum water surface elevation needed for the sternwheeler to pass under this bridge is El. 116.9, corresponding approximately to a flow of 34,000 cfs in the river. The sternwheeler likely cannot pass under the bridge with higher flows.

Hydraulics

River hydraulic conditions at the site are reasonably well defined. The proposed bridge site is located at River Mile 84.5. River gage 14191000 is located at River Mile 84.1, between the proposed bridge site and the Union Street Pedestrian/Bicycle RR Bridge. The gage has been in continuous operation since 1923; and gage information provides the following hydraulics data at the gage, proposed bridge site, and Union Street Pedestrian/Bicycle RR Bridge:

Table 1

Interval	River Flow (cfs)	Water Surface Elev. at M-B Island Site	Water Surface Elev. at Gage	Water Surface Elev. at Union St. RR Bridge
	20,000	116.0	115.5	115.1
	30,000	116.9	116.4	116.0
	40,000	119.3	118.8	118.4
	50,000	121.6	121.1	120.7
	60,000	123.6	123.1	122.7
	70,000	124.9	124.4	124.0
	80,000	125.3	125.8	125.4
	90,000	127.9	127.4	127.0
Approx. 1.2 years	100,000	129.1	128.6	128.2
10 years	163,000	136.9	136.4	136.0
50 years	232,000	141.7	141.2	140.8
100 years	269,000	143.7	142.9	142.0

In addition, USGS has created average daily water statistics for this gage. Mean flows were recorded for each month over a 55-year period. This information assists in setting the bottom elevation of the high-level bridge crossing based on the months of operation for the sternwheeler.

Table 2

Month	Mean River Flow (cfs)
January	51,000
February	41,000
March	32,000
April	25,000
May	21,000
June	15,000
July	8,000
August	7,000
September	9,000
October	12,900
November	31,400
December	48,000

Navigation Availability

Currently, the bottom of the proposed bridge for the high-level crossing, Alternative H-1, has been set at El. 156.0. This elevation provides 34 feet of clearance (low stack plus 1 foot clearance) under the new pedestrian bridge. For the purposes of this study, the maximum water surface elevation that will allow for the sternwheeler to pass under the bridge is assumed to be El. 122.0, corresponding to approximately 50,000 cfs flow in the river. It is evident from the information provided in the above table that the sternwheeler excursions on the Willamette Slough could occur during the majority of winter months.

Using the historic gage and stage data, and hydraulic data, Table 3 represents the available navigation for each alternative:

Table 3

Alt.	Crossing	Approx. Bottom of Channel	Bridge Soffit Elevation	Est. Min. LW Elev. Allowable for Nav.	Est. Max. HW Elev. Allowable for Nav.	Est. Max Flow for Nav. (River) (CFS)	Average No. Days Above Min. LW	LW % Possible/Year	Average No. Days Below Max. HW	HW % Possible/Year	Combined River & Slough Nav. Possible
								(1)		(2)	(3)
UPRR	River	97	151	100	117	34,000	350	96%	292	80%	80%
L-1	Slough	110	144.7	113	110.7	NA	200	55%	53	15%	80% (4)
H-1	Slough	110	156	113	122	50,000	200	55%	335	92%	92% (5)
H-1 + 6'	Slough	110	162	113	128	90,000	200	55%	357	98%	98% (5)
H-1 + 11'	Slough	110	167	113	133	130,000	200	55%	361	99%	99% (5)

LW = Low Water, HW = High Water, CFS = Cubic Feet per Second

Notes:

- (1) Primarily wintertime
- (2) Primarily summertime
- (3) Combined navigation on both Willamette River and Slough
- (4) Same as Willamette River because there is no navigation possible with L-1 bridge
- (5) Varying improvement in overall navigation possible by higher bridge deck

The actual hydraulic and navigational clearances will to be determined in final design, utilizing such processes as USCG permitting and ACOE/FEMA "no rise" certification. The proposed bridge elevation of all alternatives has been assumed based on available data.

Estimated Project Costs

The estimated construction and project costs for the bridge are presented in Table 4. Bridge costs are based on a price-per-square-foot (sf) basis, as described in the Final Bridge Concept Study. For total planning cost purposes, 50 percent of the estimated construction cost is added to represent total project overhead costs including design, environmental studies and permitting, construction administration, field engineering, and construction cost contingencies.

Table 4

Alternate – 14' deck	Project Planning Costs (2010 Dollars)
L-1	\$5,618,000
H-1 ¹	\$8,327,000
H-1 + 6'	\$9,713,000
H-1 + 11'	\$11,414,000

1. In the Final Bridge Concept Study the original 14-foot-wide H-1 alternate cost \$7,949,000.

NOTE: If the bridge width is decreased to 12 feet, the average cost reduction in this alternative will be approximately 15 percent.

Any increase in bridge elevation to address navigational clearance would require a correlated increase to the bridge length to meet deck grades allowed by the American with Disabilities Act (ADA) and would result in an approximate \$200,000-per-square-foot additional cost.

Conclusions

Currently, and depending upon river stage, the Willamette Queen sternwheeler has almost 100 percent available navigation on the Willamette River or Willamette Slough. Construction of the proposed new pedestrian bridge across the Willamette Slough would restrict navigation. The following table indicates the heights of the various bridge alternatives and their corresponding percentage of available navigation.

Table 5

Alternate	Crossing	Combined River and Slough Navigation Possible	Costs based on 14' Alternate
UPRR	River	80%	N/A
L-1	Slough	80%	\$5,618,000
H-1	Slough	92%	\$8,327,000
H-1+6'	Slough	98%	\$9,713,000
H-1+11'	Slough	99%	\$11,414,000

Assuming Alternative L-1 is not navigationally viable through the USCG permit process, Alternative H-1 is recommended because navigation would be prevented fewer than 30 days, which represents only about 8 percent of the time during an average year. A lower bridge alternative incrementally decreases the number of days of available navigation, and a higher bridge alternative only gradually increases the number of days of available navigation. While dramatically increasing the project cost, alternative H-1 appears to be a reasonable compromise between bridge costs and providing Navigation Clearance.



United States of America
 Department of Homeland Security
 United States Coast Guard

Certification Date: 29 Oct 2007
 Expiration Date: 29 Oct 2012
 IMO Number:

Certificate of Inspection

For ships on International voyages this certificate fulfills the requirements of SOLAS 74 as amended, regulation V/14, for a SAFE MANNING DOCUMENT.

Vessel Name WILLAMETTE QUEEN	Official Number 959851	Call Sign WBY5958	Service Passenger (Inspected)
Hailing Port ALBANY OR	Hull Material FRP (Fiberglass)	Horsepower 385	Propulsion Combination Types
Place Built NEWPORT OR, UNITED STATES	Delivery Date 10May1990	Date Keel Laid 01May1989	Gross Tons R-62
			Net Tons R-50
			DWT -
			Length R-64.8
Owner CBVB ASSOCIATES INC 2277 ORCHARD HEIGHTS RD, NW SALEM, OR 97304 UNITED STATES	Operator STERNWHEELER EXCURSIONS P. O. BOX 5896 SALEM, OR 97304 UNITED STATES		

This vessel must be manned with the following licensed and unlicensed personnel. Included in which there must be 0 certified lifeboatmen, 0 certified tankermen, 0 HSC type rating, and 0 GMDSS Operators.

1 Master	Master & 1st Class pilot	Radio Officer(s)	Chief Engineer	QMED/Rating
Chief Mate	Mate & 1st Class Pilot	Able Seamen/ROANW	1st Asst. Engr/2nd Engr.	Oilers
2nd Mate/OICNW	Lic. Mate/OICNW	Ordinary Seamen	2nd Asst. Engr/3rd Engr.	
3rd Mate/OICNW	1st Class Pilot	2 Deckhands	3rd Asst. Engr.	
			Lic. Engr.	

In addition, this vessel may carry 133 passengers, 0 other persons in crew, 5 persons in addition to crew, and no others.
 Total persons allowed: 141

Route Permitted and Conditions of Operation:

---Rivers---

WILLAMETTE RIVER WITHIN THE STATE OF OREGON FROM THE SOUTHERN END OF MINTO BROWNS ISLAND TO THE SOUTHERN END OF MCLAINS ISLAND, NOT MORE THAN 1000 FEET FROM LAND WHEN THE RIVER GAUGE AT SALEM READS LESS THAN 11 FT.

WHEN THE RIVER GAUGE AT SALEM READS 11 FT OR MORE, THE VESSELS OPERATION IS LIMITED TO THE WILLAMETTE SLOUGH LOCATED BEHIND MINTO BROWNS ISLAND.

IF THE VESSEL IS AWAY FROM THE DOCK, OR PASSENGERS ARE ON BOARD OR HAVE ACCESS TO THE VESSEL FOR A PERIOD EXCEEDING 12 HOURS IN A 24-HOUR PERIOD, AN ALTERNATE CREW SHALL BE PROVIDED.

SEE NEXT PAGE FOR ADDITIONAL CERTIFICATE INFORMATION

With this Inspection for Certification having been completed at Salem, OR, the Officer in Charge, Marine Inspection, Sector Portland certified the vessel, in all respects, is in conformity with the applicable vessel inspection laws and the rules and regulations prescribed thereunder.

Annual/Periodic/Quarterly Reinspections				This Amended Certificate Issued by:
Date	Zone	A/P/Q	Signature	
10Nov2008	SEC PortIndOR	A	Thunberg, Paul	 M. B. ZAMPERINI, CDR, USCG, BY DIRECTION Officer in Charge, Marine Inspection
27Nov2009	SEC PortIndOR	A	Thunberg, Paul	
30Nov2009	SEC PortIndOR	A	Pinsly, Christ	
-	-	-	-	Sector Portland Inspection Zone