Glosten

GUEMES ISLAND FERRY REPLACEMENT

Technical Question and Answer No. 03 *02 November 2017*

TO: Rachel Rowe, Skagit County Public Works
FROM: Will Moon, Glosten
JOB/FILE NO. 17097.01

Specific questions raised by the Ferry Committee

Question 1

Will reliability of ferry options be considered? If so, will the design include redundancy as a means to achieve reliability? If so, what elements of the electrical and drive systems will be redundant? Will mean time to failure (MTTF) and mean time to repair (MTTR) numbers be considered as part of the study?

- Reliability of the ferry is absolutely being considered as there is no planned back-up vessel. Redundancy will be included where appropriate to increase the availability of the vessel, to the extent that is financially reasonable. The design is not yet advanced to a level where choosing the needed level of redundancy at a component level is appropriate. MTTF and MTTR will be considered in later, more detailed, phases of design work.

Question 2

In comparing ferry options, will Life Cycle Cost be considered? If so, will detailed numbers be presented for review?

- Life cycle cost and its components will be part of the propulsion system analysis, which will be made available for review.

Question 3

Is an aluminum ferry being considered?

- Aluminum has been considered for the replacement vessel. It has many positive attributes, but capital cost and fatigue resistance are specific negatives. The wheel loads from large trucks are difficult to handle in reasonable thicknesses of aluminum, and it is uncommon to see an aluminum vehicle ferry of this size. The deckhouse however, may significantly benefit from being aluminum, and we are exploring this option.

Question 4

Is a catamaran style ferry being considered?

- A catamaran hull would reduce resistance during the crossing, however only a small portion (<25%) of the total energy consumption is from cruising at speed. A catamaran hull will significantly add to the capital cost of the vessel and is less forgiving with heavy vehicle loads. A steel monohull is the preferred approach for the Guemes Island ferry.

Question 5

What are the priorities in evaluating types of propulsion systems?

- Capital cost, operations and maintenance cost, weight, reliability, airborne noise and vessel air emissions are all being considered in the weighted selection system. This evaluation will be part of the concept design report.

Question 6

Please address battery technology for an electric ferry, and advancement in that technology in the past few years. How many batteries will be needed for a new Guemes, what is their carbon footprint, lifespan and disposal after depletion?

- The detailed battery selection has not been completed yet;, however, notional sizing has been performed for the propulsion study. The lifespan of Lithium Ion batteries depends on usage but generally, 5 to 10 years is an industry accepted timeframe for replacement. A target of 8 years is being used in the propulsion system trade-off analysis. Detailed battery selection will be completed in later stages of the design.

Question 7

If an electric ferry is chosen, will it need to be recharged between runs? If so, will the time necessary for recharging require a change to the present ferry schedule, and what will be the method for connecting the ferry to shore power? Will that method require additional crew?

- To reduce the size of the battery bank to a financially reasonable size, it will be charged once per round trip, from the Anacortes side. An automated charging plug will be incorporated so that no additional time or deck crew involvement will be necessary for charging.

Question 8

If an electric ferry is chosen, what provisions will/should be considered so that the vessel and up-shore facilities can adapt to improvements in battery technology over the life of the ferry?

- Ensuring the design stays flexible and designing for the future are common goals for any new vessel design. Future design work will consider these aspects.

Question 9

Will an update to the Elliott Bay Design Group's 2013 study for a refurbished ferry be part of Glosten's work?

- Glosten was not tasked with updating this study. Skagit County has determined that the current ferry is near the end of its useful and economic life and needs to be replaced.

Question 10

Is Glosten looking at a larger vessel? Why?

- The vessel capacity study has determined that a new vessel will need a significant increase in capacity to remain useful for another 40 years. A larger vessel is required to handle more

vehicles. At this point in the design work, the new vessel is proposed to carry 32 vehicles and 150 passengers. The vessel capacity study is available for review on the ferry replacement project page at www.skagitcounty.net/ferry.

Question 11

Is Glosten studying an increase in throughput - that is to increase the numbers of vehicles carried per hour, per peak period, or per day? Has Glosten been told to maintain something close to the current schedule or are they free to consider, say, one larger run per hour or one massive run per day?

- During this initial design study phase, Glosten was given some freedom to review several ferry system options including multiple vessels and a higher frequency of service. Skagit County and Glosten have determined that a minimum requirement of two round-trips per hour would be desirable. Public comment received to date has indicated that a reduction in frequency of service would not be desirable.

Question 12

Given that there is a limit to how much improvement can be made to load times (without significantly modifying docks and ramps) and travel times, how will Glosten offset the increased load times that come with increased capacity? Is Glosten looking at changes to ticketing and loading procedures as a way to increase throughput?

- A larger vessel will take longer to load. Glosten is evaluating changes to the ticketing system, vehicle queuing, and potential replacement of the aprons to accommodate concurrent vehicle and passenger loading. Complete segregation of vehicles and passengers, as well as wider vehicle lanes will help reduce loading times as well.

Question 13

Has Glosten been asked to consider the comfort of walk-on passengers?

- Yes; the comfort of passengers is always considered in a new design. Noise, vibration, natural lighting, finish materials, seating, ADA guidelines, etc. are all being considered. Glosten has specifically been asked to increase the space available for walk-on passengers.

Question 14

Will the riders have an opportunity to study and comment on the design before it is finalized?

- Absolutely. The application package to be delivered to the CRAB board for the County Ferry Capital Improvement Program grant will only be a 30% design. This application is due December 31st; however, there will be opportunities to study and comment after that as well.

Question 15

Who will name any new vessel?

- Ferry Operations Division Manager, Rachel Rowe, told Glosten that it is still too early in the process for Skagit County to answer this question.

Question 16

What provisions will be made for bicyclist and pedestrians, so they don't have to breathe car exhaust while loading and unloading?

- Vehicle exhaust can be reduced through notification and enforcement of operational procedures (no idling), but only to a limited extent. The new vessel will be designed to have more space available for bicyclists and pedestrians. A larger passenger cabin will allow more space for walk-on passengers to be away from the vehicle exhaust.

Question 17

In studying the electric ferry option, has it been determined that Puget Sound Electric will need to upgrade their infrastructure to allow for rapid recharging of the ferry batteries? If so, has that cost been compared to that of an on-shore battery similar to the Ampere project?

- Glosten is working with PSE on various aspects of the design. Cost trade-offs between utility modifications and shore side batteries are currently being discussed.

General questions raised by comment on Publicinput.com

Question 1

An electric boat isn't strong enough to navigate currents in the channel…is it?

- Electric propulsion of ships is very common and absolutely capable of handling the currents and weather in Guemes channel.

Question 2

Why can't you do a hybrid boat? In case the batteries break down or there's a long power outage.

- Our propulsion system analysis is considering hybrid propulsion.

Question 3

Electric is a bad idea…you shouldn't mix electricity and saltwater.

- All commercial vessels, including the Guemes, have some electrical power source. With proper engineering and quality building, an all-electric vessel will have an equivalent level of safety to a typical diesel passenger vessel.

Question 4

The technology is too new. Why should we be the first to test out technology that might end up not working out?

- Skagit County would not be the first and the technology is not necessarily new. Advancements in electrical controls and battery technology now make this type of propulsion system potentially viable for the Guemes Island ferry.

Question 5

I don't want to pay more. Why would ticket costs increase?

- There are many factors that affect the cost for riders of any ferry system; the cost of current service compared the cost of future service will need to be evaluated by Skagit County. Currently, the Guemes Island Ferry has one of the lowest ticket costs when compared to other ferry systems in the region.

Question 6

Ticketing slows everything down. Is there a way to make that faster? (e.g. update on mobile ticketing, etc.)

- Glosten is investigating new ticketing technologies, leveraging the experiences of other ferry operators, and proposing new systems to streamline ticketing.