

**Treasure Island Country Club (TICC)**  
**BRIDGE FEASIBILITY STUDY UPDATE**  
(Very important, please read thoroughly...)

***TO BUILD OR NOT TO BUILD, THAT IS THE QUESTION...***

Last July, during the Annual Membership Meeting, the Board brought forth the approximate costs to have the then known bridge repairs made. The members who were at the meeting were quite concerned that the high cost of these known repairs would not necessarily leave us with a solid bridge free of further repair for long. Therefore, the request was made by the membership to postpone making repairs until a feasibility study could be performed to identify various options for repair versus replacement or some combination thereof.

The results of that effort are in and now **we need YOUR membership input** at the upcoming Annual Membership Meeting (July 12, 2008).

Representatives from Art Anderson Associates and GeoEngineers (the contracted professionals who performed the study) will be on hand to **review** the **results** of this study **with YOU** at the Annual Membership Meeting. Contained in this notice is a summary of the study results for your advance review. (A full copy of the report is available by contacting Morina Dustan, Bridge Commissioner at 206-407-3482 or morinadustan@hotmail.com.)

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*The following is a summary of the main points covered in the report prepared by Art Anderson Associates and GeoEngineers:*

**Objective of Study:** Determine the best-value solution to maintain bridge access from Treasure Island to the mainland. This report looked at three typical improvement concepts. One concept is to maintain the bridge in its current configuration. The second concept is to install a new foundation system but salvage the existing concrete deck. The third concept is to replace the existing bridge with a new bridge.

Several areas that affect the bridge improvement concepts have been investigated. Main points for each area are summarized and presented below.

**1.1. Design Criteria:**

County code requires that bridges, in general, are to be designed in accordance with Washington State and/or nationally-recognized standards, and support appropriate emergency vehicles that would access the road.

Per Mason County Code, it is likely that a bridge would be required to have the minimum width of 20-ft to meet Fire and EMT vehicle access requirements.

Final determination on the bridge configuration and design requirements would be determined in a pre-certification meeting with county officials.

**1.2. Permits and Restrictions:**

The information provided in this section reflects potential requirements and restrictions based on the conceptual design options, but may change once more design details are prepared.

Work conducted within waters of the United States requires federal, state and local permits. The installation of pilings within Puget Sound will require approvals from the United States Army

Corps of Engineers (USACOE), Washington State Department of Ecology (Ecology), Washington Department of Fish and Wildlife (WDFW) and Mason County.

#### Concept 1 – Repair of the Existing Bridge

The above **permits** and consultations will need to be **acquired each time a repair is conducted** on the existing bridge. Minimum 6 months to acquire approvals and may require up to 18- months depending on the extent of the identified repair. Applicable local permit fees will be assessed at each permit submittal and these fees would be expected to increase over time. Estimated total of \$6,070 in permit fees per repair plus possible consultation fees.

Consultant fees related to permitting will be variable depending on the extent of the proposed project, but may be as much as \$20,000 per repair. The USACOE has an expedited ESA and permit process if the repairs are limited to the replacement of less than 18 pilings within a given construction season. If piling and or decking replacement does not expand the footprint of the existing structure, mitigation may not be required.

#### Concept 2 – Modified Foundation Replacement

The above permits and consultations will be required to replace the foundation of the existing bridge, however this is a one-time process and cost. Budget cost estimate is \$26,070 minimum.

Replacement of pilings will require a Section 10 Individual Permit from the USACOE and may require 18 months to 2 years for approvals. Supporting technical documentation will also be required to satisfy the above permits and consultation.

A shoreline and inter-tidal habitat characterization will be needed to document existing aquatic bed conditions and ensure impacts to eelgrass or macro-algae will not occur. Mitigation may also be required, if the number or configuration of pilings changes from the existing conditions and any increases to footprint of the structure is proposed.

#### Concept 3 – New Bridge

Permitting of a new bridge will be similar to the process required for the foundation replacement outlined in Concept Two.

Mitigation will likely be required if the decking of the bridge expands from 10 to 20 feet in width. WDFW and Mason County may require compensation for over water shading impacts caused by the expansion of the new bridge. A mitigation plan may need to be prepared to address the potential impacts from the new bridge and identify and develop potential compensatory mitigation options. The USACOE and Coast Guard may also require an analysis of potential navigation impacts from the new bridge structure and may require mitigating factors to reduce the impact to navigation prior to release of permits.

#### Permit and Restrictions Summary

Permit requirements and restrictions will be similar for each proposed concept. Permit timing for Concept 1 may require a shorter timeframe for permit acquisition than the other two concepts, but will need to be completed each time a repair is proposed. Long term costs of permitting repairs of the existing bridge are expected to exceed the cost of permitting a foundation replacement or new bridge.

In-water work windows will apply to all three concepts, unless a repair is deemed an emergency by local, state and federal agencies. Federal in-water work window is between July 16 and February 15.

Concept 1 and 2 may not require mitigation if the footprint of the proposed structures does not exceed the existing footprint. However, Concept 3 will likely require mitigation related to the

expansion of the width of the bridge. The amount and cost of the mitigation are unknown at this time, since an impact analysis has not been completed.

These permit requirements are based on the three conceptual options for the repair and/or replacement of the TICC bridge developed by Art Anderson Associates, Inc. Additional permit requirements or revisions to the final design may be imposed by regulatory agencies during the permitting process. Additional project restrictions may include in-water work windows, which limit the timeframe a contractor can perform work within Waters of the United States. Mitigation requirements are unknown at this time, since the designs are conceptual and an impact analysis has not been conducted for the three concepts. These are general permit requirements and restrictions based on the available information provided.

### **1.3. Discussion of Bridge History and the Three Concept Designs:**

#### ***1.3.1. Existing Bridge – Description and History***

The existing Treasure Island Bridge is a privately-owned one-lane bridge approximately 789-ft long by 12-ft wide, providing a 10-ft clear driving lane connecting Treasure Island to the mainland. The bridge has a timber foundation consisting of timber piles, timber cross bracing and timber pile caps. This timber foundation was constructed in 1953, resulting in a timber foundation that is 55 years old. The bridge deck consists of a concrete deck and concrete curb with timber guard rails. The concrete deck was constructed in 1974, replacing the original timber deck. The Treasure Island Country Club owns and maintains this bridge for the use of its members, who are the owners of 251 properties located on the island.

The current bridge has a 35-year old concrete deck and a 55-year old timber foundation. The typical lifespan of a concrete bridge deck built in the 1970s is 50 years. The estimated lifespan of a treated timber pile in a marine environment is 50 years in a northern climate. The pile caps would have a similar lifespan of 50 years and the cross bracing would typically have a much lower life span, maybe 20 to 25 years. Alternatively, new bridges can be designed for 75-year life spans.

The existing timber foundation has three primary components: the timber piles, the timber pile caps and the timber cross bracing. According to TICC bridge maintenance records, 97% of the piles are the original timber piles, 98% of the pile caps are the original timber pile caps and 43% of the timber cross bracing is the original timber cross bracing. Of the original remaining piles, approximately 1/3 have repairs. The pile repairs primarily consist of injecting epoxy into the pile gaps and voids to prevent further deterioration. These types of repairs do not restore the strength nor reset the life expectancy of the repaired pile. Approximately 15% of the pile caps have repairs which consist of adding a plank to each side and bolting through the damaged pile cap. Again, this type of repair does not restore the pile cap to a new configuration. Most of the timber foundation is 55 years old and beyond its expected life span.

In May 2007 TICC obtained a construction repair estimate based on the 2005 Annual Inspection, 2006 Special Inspection and resulting repair recommendations made by Sergeants Engineering. This construction repair estimate was to replace or splice 8% of the timber piles, 15% of the pile caps and 30% of the cross bracing for approximately \$310,000. This estimate is for a minimum construction cost and does not include required engineering updates, debris removal, permitting fees nor a contingency. It is likely that the repairs and costs will increase every few years until the entire timber foundation is replaced.

### 1.3.2. Evaluation of Bridge Concepts

Three concepts were evaluated to find the best method to maintain bridge access from Treasure Island to the mainland.

Concept 1: Replace existing deteriorated bridge components with new components of the same material and configuration. In other words, we will replace deteriorated timber piles with new timber piles, deteriorated pile caps with new timber pile caps and so forth.

Concept 2: Replace the existing timber foundation with a new modified foundation but salvage the existing concrete deck.

Concept 3: Replace the existing bridge with a new bridge.

#### Concept 1 – Repair of the Existing Bridge

The existing bridge has exceeded its anticipated 50-year life span by 5 years. Moreover, repairs and repair costs have significantly increased in the last few years. Most of the timber components are the original timber components and they will require replacement or significant repairs within 10 years. At the current estimated construction repair costs, this equates to an estimate of \$3.320 million in 2008 dollars.

Bridge Structure	\$	2,100,000	
<u>Upland Modifications</u>	\$	<u>200,000</u>	
		Subtotal	2,300,000
Survey, Geotechnical, etc	\$	100,000	
Engineering, 15%	\$	345,000	
<u>Contingency, 25%</u>	\$	<u>575,000</u>	
		Total	\$ 3,320,000
		TICC Properties	251
Cost per Property	\$		13,227 / TICC property

#### Concept 2 – Modified Foundation Replacement

This concept replaces the existing foundation with new steel piles and steel pile caps and salvages the existing concrete deck. The advantage to this system is that the new piles can be installed next to the bridge without affecting the existing bridge. We can streamline the construction processes; use newer, stronger and longer-lasting materials; and ensure a better foundation. However, we are still limited by the remaining design life of the existing bridge deck. Also, we cannot use the advantage of a stronger foundation, as we are limited by the existing span of the existing concrete deck. For example, we would need to install 45 bents rather than the 26 proposed for the replacement bridge. In effect, we can use materials that have increased strength and durability (and cost), but due to the existing design configuration, we cannot optimize their use as well as we can in a new bridge configuration. We estimate the cost to be similar to concept one, approximately \$3.040 million in 2008 dollars.

Bridge Structure	\$	1,900,000	
<u>Upland Modifications</u>	\$	<u>200,000</u>	
		Subtotal	2,100,000
Survey, Geotechnical, etc	\$	100,000	
Engineering, 15%	\$	315,000	
<u>Contingency, 25%</u>	\$	<u>525,000</u>	
		Total	\$ 3,040,000
		TICC Properties	251
Cost per Property	\$		12,112 / TICC

**NOTE:** Above costs for concepts 1 and 2 are for repair/replacement of the bridge “under-structure”, not the bridge deck. The deck and railings will likely need to be replaced as well in about 15 years. The added cost for that work alone is estimated at \$1 to 1.5 million dollars.

Concept 3 – New Bridge

A new bridge can take advantage of all material and design improvements over the last 50+ years and can be designed for a 75-year lifespan. We expect that a 20-ft clear lane will be necessary for fire access requirements (single lane effect can be maintained by striping and walk-way design, if a two lane bridge is not desired). However, even with the wider lane, the estimated structural cost would be approximately \$4.4 million in 2008 dollars.

Bridge Structure		\$	2,900,000
Upland Modifications		\$	200,000
	Subtotal		3,100,000
Survey, Geotechnical, etc		\$	100,000
Engineering, 15%		\$	465,000
Contingency, 25%		\$	775,000
	Total	\$	4,440,000
	TICC Properties		251
Cost per Property		\$	17,689 / TICC property

NOTE: The above dollars are budget estimates only in all cases, They do not include inflation, nor interest from a loan source.

***WHERE DO WE GO FROM HERE?***

Since the release of the above report data, the Board of Trustees has met and is also collecting information on a 4<sup>th</sup> concept of turning our bridge over to the County/State.

In addition, TICC has lost its Liability Insurance on the Bridge due in part to the fact that bridge repairs have not been made. Therefore, there is now a new element of risk that we must consider as we move forward in 2008.

**Next steps are:**

1. Educate membership and get membership input
2. Obtain a new inspection of bridge to gauge current conditions, safety and drop-dead timeline for repair/replacement action. Regardless of which option we consider, it is likely that we will need to spend money making repairs in order to insure bridge safety until such time as a more definitive course of action is made by the membership.
3. Obtain funding information to present to membership for assessment vote
4. Obtain information on what County/State programs might be available to TICC (such as the State provided Road Improvement District (RID) program.)

**It is VERY IMPORTANT for the members of the TICC to actively participate in the discussion and decision making of this issue. Your opportunity to ask questions of the paid consultants and be heard by your fellow members is coming up at the Annual Membership meeting. WE NEED YOU TO BE THERE!!!**

If you would like a full copy of the report please contact Morina Dustan, Bridge Commissioner at 206-407-3482 or morinadustan@hotmail.com.

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*Following are some questions that have already been asked and answered...*

Q: Can we replace creosote pilings? Can we still use timber pilings in bridge plans?

A: Creosote is not allowed in the marine environment anymore. Arsenic Zinc Copper (AZC) treated wood is still allowed, but we don't know for how much longer. You would probably have to replace with concrete or steel. Concrete gets you through the permitting process a little easier because piles must be sounded while installing and steel resonates more than concrete – vibrations could kill fish.

Q: What is the lifespan of concrete versus steel?

A: There isn't a big difference between concrete and steel. Both could last for 75 years.

Q: With an estimated repair-in-kind cost of \$3.32 million over ten years, and then replacement of bridge decking, will that give us a private, scenic, historic bridge for another 50 years?

A: The total cost would be higher than a new bridge and the life expectancy shorter. Additionally, there are restrictions on replacing the foundation components with exactly the same materials and further restrictions are coming. Replacement in kind may not be an option for another 50 years.

We are providing technical recommendations that include the estimated cost for each option. We believe the historic, aesthetic and privacy issues are for the home owners to address. As stated in the report, certain requirements may be added or waived by the county.

Q: Are there other types of bridges that you have looked at?

A: A modern cable stayed bridge is one option. It might be something to look at if we can keep it in the same price range as the others. You have a nice long span, you've got some distance to work with. Some people say they're gorgeous, but some people might say that it ruins the historic look of the island.

Q: What would typical maintenance consist of and cost on a new bridge structure?

A: Maintenance costs will apply to all three options and the maintenance on a new structure will be lower than the other two options. Therefore, we do not believe that this answer will affect the decision on which bridge option to pursue. We have concentrated on new bridge construction. We haven't looked at the maintenance side of it, but we would be happy to do that, at a cost.

Q: If a new bridge is built, how long would the closures be?

A: A new bridge would be built alongside the existing bridge, so closures should be minimal. The bridge would curve towards the existing abutment at each end. During the last phase, a closure would be required as the two ends are tied into the abutments.

Q: Will it be possible to stay within our property lines building a new bridge alongside the existing one?

A: Yes, the bridge has to stay within the property lines. A survey with elevations, contours and property lines will need to be done.

Q: What are upland improvements as noted in the cost breakdown?

A: If there is an alignment change to the bridge and/or widening of the bridge, the road approaches would need to be modified.

Q: We have outstanding bridge repairs that need to be done. How are we going to address those?

A: If we go with option one, then I would recommend that you start fixing and move forward. If you decide to go with option 2 or 3, then fix only the things that need to be fixed, repair components if possible instead of replacing.