POSITION PAPER ON THE CORPUS CHRISTI HARBOR BRIDGE PROJECT

Replacement of the Harbor Bridge is necessary for improved safety conditions, positive economic impacts on the region and environmental sustainability. The Harbor Bridge is a project that will involve approximately $984 million of expenditures, the vast majority of which is federal funding provided via the Federal Highway Administration (FHWA). The Federal Highway Administration (FHWA) has conditioned TxDOT's use of federal funding for the bridge on TxDOT's agreement to a series of Title VI mitigation actions. To comply with its mandated mitigation actions, TxDOT has asked the City of Corpus Christi, the Port of Corpus Christi Port, and the Corpus Christi Housing Authority to enter into a four-party agreement with TxDOT to address the required mitigation. The City Council, the Port Commission, and the Board of Directors of the Housing Authority are all expected to meet on Tuesday, December 15, to consider and take action of this four party agreement.

I. Safety Impact

A 2003 Feasibility Study performed by the Texas Department of Transportation (TxDOT) concluded that the Harbor Bridge, which crosses the Corpus Christi Ship Channel at U.S. 181, requires major improvements to remain a safe transportation route for current and future traffic patterns, expected to exceed 60,000 vehicles per day by 2030.[1,2,3] Several design features of the Steel Arch Truss Harbor Bridge do not meet current TxDOT and/or Federal Highway Administration (FHWA) Standards, including: no existing shoulders, which limits drivers' site distance and maneuvering, and leads to traffic congestion during accidents or disabled vehicles on the bridge; approaches steeper than allowed by current design standards; exit and entrance ramps, which do not meet current standards for acceleration and deceleration lengths; and South bound drivers exiting the Harbor Bridge have three destination exits (Downtown Corpus Christi, I-37 North or Staples St.) all at the same point, where current design standards require 1,000 feet between successive exit ramps.[4,5] The obsolete design features of the bridge likely are a contributing factor to a documented accident rate on the Harbor Bridge that exceeds the statewide average.[6]

As well as falling short of the safety requirements in design, the current Harbor Bridge also has structural conditions, which make the long-term use of the bridge unsafe for travelers. Under FHWA guidelines, the existing bridge is a "Fracture Critical Structure" due to the lack of redundancy. Should one of the 280 fracture-critical elements in the existing bridge fail, adjacent elements would receive the burden of weight and could result in a partial or complete bridge collapse. The concrete deck, replaced in 1987 with normal-weight concrete, is experiencing increased loads and traffic, contributing to fatigue on the structural integrity and joints, therefore decreasing the life of the bridge and increasing maintenance and repair. Despite repairs in 2009, and between 2010 and 2012, a structural assessment in September 2012 revealed continuing and reoccurring corrosion issues, stemming from a steel structure bridge in a marine environment.[7, 8]

Harbor Bridge closures also pose a threat to the community during a hurricane evacuation. US 181 and I-37, including the Harbor Bridge, are designated hurricane evacuation routes for San Patricio and Nueces Counties. In a high volume evacuation in which I-37 reaches full capacity, traffic is diverted to US 181 and the Joe Fulton International Trade Corridor.

Understanding the design flaws of the fracture-critical bridge, there is an increased safety risk to the community of unnecessary congestion during an emergency evacuation.[9] A new bridge would enhance the evacuation route by including shoulder lanes and provide a reliable exit route during emergencies.

The United States Coast Guard issued a safety alert in September 2014 regarding air draft clearance for vessels. Air draft is the distance from a vessel's highest point to the water base. From 2003 until the release of the alert, there were 205 bridge strike incidents, most caused by an air draft clearance issue.[10] The total vertical clearance of the Harbor Bridge is 138', which allows for modest to medium sized vessels. Modern day vessels, such as the Panamax, require an air draft of 190' minimum for safe clearance. Current Harbor Bridge specifications do not meet safe clearance of large vessels.

II. Economic Impact

The Environmental Impact Study (EIS), conducted by TxDOT, released in 2014, estimates the construction of a new bridge would result in $761 million in additional household earnings based on construction costs of the project, using U.S. Bureau of Economic Analysis multipliers.[11]

Over the last 30 years, maintenance costs on the existing bridge have exceeded $70 million and repairs have not provided a structurally safe bridge for future traffic patterns. Extending the life of the bridge for another 70 years would cost an estimated $400 million (based on 2012 estimates and probable net value), and would require a bridge closure period of 21 to 24 months.[12] These repairs would extend the structural life of the bridge, however would not meet current design standards to improve driver safety such as shoulders and appropriate approach and exit measures.

In addition to maintenance costs, there could be negative economic impacts to the Coastal Bend resulting from a complete shutdown of the "Fracture Critical" Harbor Bridge for major rehabilitation projects if we choose a "No Build" option. According to a 2015 Mobility Scorecard report, annual costs of US Highway congestion are roughly $160 billion due to loss of production and additional fuel burn.[13] Each day the Harbor Bridge is closed, 50,000 vehicles would are rerouted through the Joe Fulton International Trade Corridor, adding 20 miles and approximately one hour of travel time. While the Joe Fulton International Trade Corridor provides an alternate route for travelers, the corridor maintains a steady traffic flow of commercial trucks, oftentimes moving oversized cargo in and out of port facilities. An increase in traffic on this road would slow production not only for those being rerouted, but also interrupt commercial operations along Port Corpus Christi Inner Harbor, and increase the need for safety and security protocols.

A new bridge would allow for future economic growth of the region, allowing for increased freight traffic from larger vessels. The Harbor Bridge has a 138' vertical clearance, restricting the types of vessels that can call at the Port. Vessels that exceed this navigational clearance must take on ballast water after unloading cargo in order to reduce draught and have a safe exit from the Inner Harbor, a timely and expensive process. A new bridge alternative would allow anywhere from 206'-216' feet of clearance, thereby allowing the Port to be globally competitive in the transportation industry.[14]

III. Environmental Sustainability

As noted earlier, the Joe Fulton International Trade Corridor provides an alternate route for travelers when the Harbor Bridge is closed for maintenance or vehicle accidents. The Joe Fulton Corridor was constructed in 2007 to provide commercial vehicles quick and efficient access to the Inner Harbor and to U.S. 181 and I-37 from port facilities. The Port's Environmental Management System works to protect the grasses and public fishing areas along the corridor, as well as install measures to maintain clean air standards at the Port, such as no idling of vehicles and use of diesel versus gasoline vehicles. Should the Harbor Bridge be closed for an extended period of time, due to major rehabilitation repairs, traffic along the corridor would extend travelers' idle time and gas consumption, interrupting the current air attainment standards for port industries. From 2002 to 2014, the Corpus Christi Urban Airshed, defined by Texas Commission on Environmental Quality as Nueces and San Patricio County, has experienced a decrease in ozone values.[15] An increase in traffic could pose a serious threat to air attainment for Port Corpus Christi, which in turn negatively affects the region on an economic standpoint.

The proposed bridge would reduce the vertical grade for approaches, includes interior and exterior shoulder lanes, and exit and entrance ramps that meet current FHWA and TxDOT design standards and would be constructed of materials resistant to marine erosion, providing a safe bridge for South Texas for the next 75 to 100 years.[16] A new bridge, versus a "No Build" option, would provide not only an economic gain, but also a cost savings from bridge shutdowns and protection of current environmental standards for the region.

Notes:

1. https://ccharborbridgeproject.files.wordpress.com/2012/03/harbor-bridge-feasibility-study.pdf, TxDOT Feasibility Study for U.S. 181 (Harbor Bridge), Executive Summary, p 1
2. Corpus Christi Caller Times, "*Harbor Bridge a Top Traffic Issue*," January 18, 2013
3. http://bridges.findthedata.com, 3-16-M-SW-OF-NUECES-CO-LN, number 539053
4. TxDOT and FHWA, October 2014, pp. 8, 9
5. US 181 Harbor Bridge Project, Final Environmental Impact Statement, TxDOT and FHWA, November 2014, pp. 1-5 to 1-7
6. http://ccharborbridgeproject.com/questions, "Question 1. Why is TxDOT considering replacing the Harbor Bridge?"
7. TxDOT and FHWA, November 2014, pp. 1-3 to 1-5
8. TxDOT and FHWA, October 2014, pp. 6, 7, 8
9. TxDOT Environmental Impact Study, Section 1 Need and Purpose of Project, p 1-6, 1-7
10. United States Coast Guard, Air Draft is Critical!, September 9, 2014
11. TxDOT Environmental Impact Study, Summary: http://ccharborbridgeproject.com
12. Communication with TxDOT Bridge Division, November 30, 2015
13. 2015 Urban Mobility Scorecard: http://mobility.tamu.edu/ums/report/
14. TxDOT Environmental Impact Study, Section 2.4.2.3 Bridge Height – Navigational Air-Draft Clearance
15. http://www3.epa.gov/ozoneadvance/pdfs/2015corpusupdate.pdf p 3
16. TxDOT and FHWA, November 2014, p. 2-3