

Conclusions

9 Conclusions

The Phase I objective was to investigate the project for its intended use of being navigable and improve drainage at North Beach. LAN developed and analyzed two different options or configurations for the canal; Option 1 includes an inlet/outlet to the bay at the northern end; Option 2 is a shorter canal with an inlet/outlet to the bay at the center of the North Beach.

LAN first evaluated the existing drainage system which is split to convey stormwater to the north and to the south. Based on our review of previous studies and field inspections performed by LAN, we have concluded that the existing storm sewer system has issues such as siltation in the pipes, flow line elevation below mean sea level and collapsed pipes. These in of itself create problems with providing adequate drainage during routine rainfall events.

LAN's drainage analyses concluded that the proposed canal could improve drainage primarily from rainfall events; however, due to the location of the proposed canal, to achieve maximum benefit, the adjacent areas would need to be raised to a minimum elevation of +6.5 (NAVD-88) near the beach property lines and along Seagull Boulevard, and slope inward towards the proposed canal. Additionally, the storm sewer system would have to be replaced and redirected towards the canal rather than the current north-south conveyance in-place. This would require installation of new storm sewers, inlets, and culverts. Raising of North Beach to the necessary elevations would require an average of 2-3 feet of fill over the entire project area. The amount of fill required exceeds the quantities of what would potentially be dredged from the canal; therefore suitable material would have to be imported from somewhere else. Raising the site would likely be a long-term initiative required as part of a master development plan that coincides with the drainage system. It would need to be developed and enforced by the City. Addressing existing structures and future development plans to accommodate the filling, grading and building the new storm sewer system was not included in the scope of this work.

With regards to navigability, the proposed canal would be accessible to most recreational pleasure craft that are common to the Coastal Bend. There are restrictions however for larger watercraft, such as long yachts (+50-foot length) and tall sailboats (+20-foot height). Primarily because water crossings would be necessary over the canal to accommodate traffic and not exacerbate public safety concerns by limiting access from east to west. These water crossings limit the types of watercraft on the canal.

Numerical modeling was conducted to help evaluate tidal exchange between the proposed North Beach Navigable Canal and Corpus Christi Bay, and to evaluate Water Quality conditions that may occur in the canal under various design layouts. The modeling results show that both proposed layouts with an upstream culvert may meet TCEQ's Dissolved Oxygen (DO) criteria. The additional culvert on the south end of the proposed canal would promote better exchange of water in and out of the canal to the bay. The results of the modeling showed that DO levels at the bottom of the canal could be a concern for complying with the DO criteria. Low dissolved oxygen can create fish kills and produce bacteria in excess of limits established by TCEQ. In addition to DO, LAN evaluated Total Suspended Solids, Trash / Floatables, and Algae and Bacteria issues that may arise. Implementation of best management practices could reduce the impacts from these sources. Additionally, a shallower canal may also improve DO levels. If non-compliance were found by TCEQ, the water body may be put on the impaired water-body or the 303(d) list that may then trigger Total Maximum Daily Load (TMDL) studies, enforcement actions, and potentially lawsuit by environmental groups. Not being able to meet DO criteria would also affect the environmental permitting of the project. Long-term siltation and maintenance dredging were not included in the study.

Traffic patterns to four key destinations on North Beach were assessed to develop impacts that may come as a result of the proposed canal improvements. Based on assessments, the proposed canal will cut off traffic from east to west across the entire area, side streets that typically carried traffic from US181 to key destinations would be cut-off, and traffic would have to be routed differently than it is now. Additionally, due to the fact that Harbor Bridge will only provide for one exit to North Beach, increased quantities of traffic have the potential for reducing the levels of service at Beach Avenue. Several recommendations to mitigate these impacts were presented in the report, including improved signage, striping, and routing of traffic at the Beach Avenue exit, capacity improvements to several key collector streets, and conversions of some of the roadways from one-way to two way streets. To address access from one side of the canal to the other, bridge crossings are recommended for both Options.

Additionally, LAN made initial coordination with the United States Army Corps of Engineers (USACE) to discuss potential regulatory requirements for the proposed canal. We also completed desktop assessments to determine potential impacts to Waters of the United States, wetlands, threatened and endangered species, and cultural resources, located in or near the project area. Based on the USACE, an Individual Permit would be required; this permit may take 18-24 months to receive and will require public and interagency input and coordination. Our initial assessments discovered minimal impacts to wetlands, endangered species, or cultural resources; however, the permitting process will determine further requirements to mitigate impacts.

In order to construct the canal improvements proposed in this study and redevelop North Beach to achieve maximum benefit, achieve the goals of previously adopted and on-going City of Corpus Christi Plans and Initiatives, and reduce impacts of adjacent construction from the Harbor Bridge, the project should be phased with short-term, mid-term, and long-term improvements. The burden for implementation of these improvements is not solely the responsibility of the City; it will take development agreements, ordinance revisions, and public/private partnerships, to achieve these objectives.

In summary, either canal option can improve drainage from the 25- and 100-yr rainfalls, only if storm sewer systems are improved and the areas are filled and regraded. Effects from storm surge will not be addressed with construction of a canal. Only raising North Beach to a higher elevation and/or constructing other resiliency measures such a seawall, similar to the flood protection system in Downtown Corpus Christi, would provide protection from surge. With regards to navigability, the canal can work for a large array of vessels. A shallower canal could improve water quality and not cause restrictions to navigation.