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Alternatives Analysis

The proposed project is needed because increased and projected growth in the area is causing traffic demand to exceed capacity of the existing roadway; the current roadway layout creates operational issues such as congestion at the intersections and on the main lanes, and access issues to adjacent neighborhoods; the facility currently has limited bicycle and pedestrian accommodations; and for improved hurricane evacuation. The purpose of the proposed project is to improve mobility and reduce congestion by constructing additional lanes, ramps and turn lanes; improve traffic operations by bringing the roadway up to current design standards; facilitate bicycle and pedestrian activity by upgrading bicycle and pedestrian accommodations and to facilitate hurricane evacuation by providing additional lanes.

TxDOT considered the following siting criteria to determine the preferred alternative: 1) Meet the latest design, drainage, and safety standards in the December 2022 Roadway Design Manual 2) Utilize the existing roadway as a portion of the roadway expansion 3) Utilize the existing ROW to minimize costs of construction and impacts from construction to users of the roadway and 5) Minimization of environmental impacts. Four alternatives were considered based on the above siting criteria.

No action alternative: The no action alternative results in no construction requiring a Corps permit and may include either the applicant electing to modify the proposal to eliminate work in waters of the US, or denial of the permit. In this instance a permit authorizing the discharge of fill material into waters of the US would either not be required or be denied. In either case no additional fill would be authorized to be discharged into any additional waters of the US or special aquatic sites. The proposed roadway expansion and modernization to current roadway safety standards would not occur. With no improvements, the current capacity of I-45 from the Causeway Bridge to 61st Street would not be adequate to accommodate traffic volumes in 2045 causing increases in traffic congestion. Under the no build alternative traffic projections indicate congestion will increase along I-45 from the Causeway Bridge to 61st Street. Currently, approximately 76,000 vehicles a day travel through the project area. By 2045 this number is expected to increase to approximately 111,000 vehicles a day.

Off-site alternatives: This alternative considers alternatives off-site from the project site such as new adjacent roadway locations that would closely parallel the existing roadway, I-45. The consideration of off-site locations for a new roadway are limited by meeting the current roadway design standards and a connection to the logical start and termini of the existing I-45, which would need to connect Broadway Ave to the I-45 Causeway. Any new roadway tie-in to the existing I-45 south of the causeway would result in permanent impacts to black rail habitat, as documented black rail habitat is located on either side of south of the causeway I-45 at this location. Alternatives to the south of the existing I-45 are not practicable, as much of the area south of the project area consists of Offatts Bayou and would result in crossing approximately 50 acres of Offatts Bayou, and both temporary and permit impacts to that water feature. In order to minimize residential and commercial displacements, any new location roadway to the north of the existing I-45 would result in additional wetland impacts. Permanent wetland impacts resulting from an off-site alternative could vary between 6 and 16 acres. Even with prioritizing impacts to waters and wetlands over commercial and residential displacements, off-site alternatives would result in additional commercial and residential displacements.

On-site alternative 1 (applicant's preferred alternative): The preferred alternative would include reconstructing and widening IH 45 from south of the Galveston Causeway Bridge to 61st Street and adding a direct connector from northbound 61st Street to northbound IH 45. The proposed improvement would

consist of eight 12-foot-wide travel lanes (four in each direction) with 4-foot-wide inside and 12-foot-wide outside shoulders. The frontage roads would include four 11-foot-wide travel lanes (two in each direction) with a 5-foot-wide bike path and 5-foot-wide sidewalk separated from the frontage roads by a 1-foot offset. Grade separated intersections, with U-turns and turning lanes would be constructed at the following intersections: Harborside Drive, 71st Street, and 61st Street onto northbound IH 45. A one-lane direct connector would be constructed from northbound 61st Street onto northbound IH 45. The proposed project would require approximately 4.57 acres of additional right-of-way (ROW) and three commercial displacements.

Design and construction of the IH 45 improvements will include all practicable measures to continue to minimize harm to the environment. Many of the improvements will take place within the existing IH 45 ROW, reducing or eliminating impacts to surrounding areas. As this is a widening project, the design called for expanding the roadways inward to avoid aquatic resources, reduce project footprint expansion, and minimize community impacts. The western portion of the project will remain elevated to avoid impacts to coastal marsh.

The only changes to access and travel patterns would be beneficial, as the proposed project would improve access to I-45 from northbound 61st St. via a new direct connector, eliminate left turns at signalized intersections for vehicles making U-turns at Harborside Drive and 71st St., and improve pedestrian access to businesses alongI-45 by providing sidewalks. There will be no adverse impacts on community cohesion associated with the proposed project, as the project would not result in separation of any communities or as previously noted, any adverse changes in access and travel patterns. Community cohesion may be slightly improved by improved access or by the construction of sidewalks.

On-site Alternative 2: On-site Alternative 2 is similar to on-site alternative one in that it would involve widening the current I-45 roadway and consist of eight 12-foot-wide travel lanes (four in each direction) with 4-foot-wide inside and 12-foot-wide outside shoulders. The frontage roads would include four 11-foot-wide travel lanes (two in each direction) with a 5-foot-wide bike path and 5-foot-wide sidewalk separated from the frontage roads by a 1-foot offset. On-site alternative 2 would not include the direct connector from north bound 61st street to north bound I-45 but would include a direct connector between I-45 and Harborside Drive. This alternative would require approximately 2.75 acres of additional ROW bringing the total proposed ROW to 5.73 acres. On-site-alternative 2 would result in one additional commercial displacement, for a total of 4 commercial displacement. Placement of the direct connector between I-45 and Harborside drive would result in an additional 0.23 acres of wetland impacts for a total of 1.62 acres of impacts to wetlands resulting from on-site alternative 2.

Summary of Impacts to Aquatic Resources Resulting from Alternatives

	No Build Alternative	**Off-site Alternative**	**On-site Alternative 1 (Preferred Alternative)**	**On-site Alternative 2**
Permanent Wetland Impacts (Ac)	0.0	6-16	1.39 acres	1.62
Temporary Wetland Impacts (Ac)	0.0	0.0	0.0	0.0
Permanent Waters of the US Impact (Ac)	0.0	10-25	0.0	0.0
Temporary Waters of the US (Ac)	0.0	10-25	0.0	0.0

The no action and off-site alternative are not practicable because they do not meet the overall project purpose and siting criteria. The no action alternative is not practicable because it does not authorize the impacts needed to construct the proposed project. The off-site alternative is not practicable because this alternative would involve relocation of existing residences and commercial and industrial development, additional costs for new ROW acquisition, maintenance for the existing and new roadway, and an estimated greater impact to waters of the US when compared to the applicant's preferred alternative. The off-site alternative would also not improve the existing roadway that serves at the primary north-south evacuation route for the communities located on Galveston Island.

On-site alternative 2 is a similar project to the applicant's preferred alternative but would result in greater impacts to wetlands and waters of the U.S. and more displacements than the preferred alternative. On-site alternative 2 is also not practicable, as it does not include the direct connector between 61st Street and I-45, which will provide a more efficient evacuation route for a greater proportion of individuals, should an evacuation of the island be needed prior to a hurricane.

The on-site alternative 1, the applicant's preferred alternative, will meet the required roadway design standards, utilize the existing right-of-way, minimize construction costs and impacts to adjacent property owners, provide additional facilities for bicyclists and pedestrians, and improve and expand the north-south roadway to serve as a primary hurricane evacuation route. The applicant's preferred alternative is the least environmentally damaging practicable alternative.