

Ordinance adopting the North Beach Drainage Improvement Project Plan and repealing Ordinance No. 031970 authorizing a previous drainage solution.

WHEREAS, the North Beach Drainage Improvement Project (“Plan”) with preferred drainage improvement projects was presented to City Council on August 30, 2022, by MIG, Inc.;

WHEREAS, the Plan includes priority projects to improve drainage on North Beach;

WHEREAS, the first priority project is to elevate Beach Avenue, Gulf Spray Boulevard and the beach access parking with pedestrian access to the beachwalk;

WHEREAS, the second priority project is to design and construct a linear open space channel and elevate Timon, Surfside and access to Eco and Dolphin Parks; and

WHEREAS, other priority drainage improvement projects may include new outfalls, backflow prevention, stormwater pumps and additional elevations and channels.

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF CORPUS CHRISTI, TEXAS:

SECTION 1. Ordinance 031970 is hereby repealed.

SECTION 2. The attached **North Beach Strategic Development Plan**, providing for preferred future drainage improvement projects on North Beach, is hereby adopted.

That the foregoing ordinance was read for the first time and passed to its second reading on this the _____ day of _____, 2022, by the following vote:

Paulette Guajardo _____	John Martinez _____
Roland Barrera _____	Ben Molina _____
Gil Hernandez _____	Mike Pusley _____
Michael Hunter _____	Greg Smith _____
Billy Lerma _____	

That the foregoing ordinance was read for the second time and passed finally on this the _____ day of _____ 2022, by the following vote:

Paulette Guajardo _____	John Martinez _____
Roland Barrera _____	Ben Molina _____
Gil Hernandez _____	Mike Pusley _____
Michael Hunter _____	Greg Smith _____
Billy Lerma _____	

PASSED AND APPROVED on this the _____ day of _____, 2022.

ATTEST:

Rebecca Huerta
City Secretary

Paulette Guajardo
Mayor

North Beach Strategic Development Plan




CORPUS CHRISTI – NORTH BEACH
Strategic Development Plan – Preferred
Drainage Improvement Project Summary


M I G

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CHALLENGES – SEA LEVEL



Direct Tidal Flooding Direct Backflow Flooding Groundwater Seepage Flooding



Ground Sea Level Elevated Sea Level Gravity Flow Drainage Conduit Water Table

and Resulting Floodwater

Original Image from <https://www.nature.com/articles/s41598-020-60762-4/figures/1> - Labels and photo examples have been modified

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CHALLENGES - RAINFALL



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CHALLENGES - RAINFALL



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CHALLENGES - RAINFALL



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Vulnerabilities



- Areas subject to tidal flooding at highest observed tide, elevation 3.5'.
- Additional areas are vulnerable to relative sea level rise and rainfall flooding.

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Vulnerabilities



- Key routes to beach access points and parks are vulnerable.

Existing Roadway Flooding Vulnerability
Higher Vulnerability
Lower Vulnerability

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A Layered Solution

A. DUNES (COASTAL BARRIER) 	B. SEAWALL (COASTAL BARRIER) 	C. TIDE GATES/VALVES (BACKFLOW)
D. ELEVATE INFRASTRUCTURE 	E. ELEVATE PARCELS 	F. OPEN CHANNEL CONVEYANCE
G. IMPROVE PIPED CONVEYANCE 	H. SEDIMENT MONITORING + CLEANING 	I. STORMWATER PUMPS

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Intervention Effectiveness

Intervention(s)	Direct Tidal Flooding	Backflow Flooding	Groundwater Seepage Flooding	Rainfall Induced Flooding
A. Dunes	●●●●			
B. Seawall	●●●●		●●●	
C. Tide Gates/Valves		●●●●		
D. Elevate Infrastructure	●●●	●●●	●●●	●●
E. Elevate Parcels	●●●	●●●	●●●	●●
F. Open Channel Convey.				●●
G. Imp. Closed Convey.				●●
H. Sed. Monitoring + Clean.				●
I. Stormwater Pumps			●●●	●●●
#1. Stormwater Convey. + Ditch Imp. "Option 1" G+H				●●●
#2. Linear Park "Option 2" A+D+E+F+G+H	●●●●●	●●●●●	●●●●●	●●●●●
#3. Nav. Canal "Option 3A" A+D+E+F+G+H	●●●●●	●●●●●	●●●●●	●●●●●
#4. Nav. Canal "Option 3B" A+D+E+F+G+H	●●●●●	●●●●●	●●●●●	●●●●●
#5. Storm Drains w/ Elev. A+D+E+G+H	●●●●●	●●●●●	●●●●●	●●●●●
#6. Storm Drains w/o Elev. + Pumps A/B+C+G+H+I	●●●●●	●●●●●	●●●●●	●●●●●

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Decision Criteria

	Priority 1		Priority 2		Priority 3		
	Cost	Maintenance Cost	Accelerated Delivery Timeframe	Economic Dev. Commerce	Natural Systems Ecology	Local Oriented Amenity / Recreation / Openspace	Access/ Connectivity
#2. Linear Park "Option 2" A+D+E+F+G+H	\$\$	\$\$	●●●	●●●●●	●●●●●	●●●●●	●●●●
#3. Nav. Canal "Option 3A" A+D+E+F+G+H	\$\$\$\$	\$\$\$		●●●●●	●●	●●●●	●●
#4. Nav. Canal "Option 3B" A+D+E+F+G+H	\$\$\$\$	\$\$\$	●				
#5. Storm Drains w/ Elev. A+D+E+G+H	\$\$\$	\$\$\$\$	●●●	●●●●	●	●	●●●●●
#6. Storm Drains w/o Elev. + Pumps A/B+C+G+H+I	\$\$\$	\$\$\$\$	●●●●	●●●●	●	●	●●●●●

* Delivery Timeframe category considers how quickly improvements can be implemented, including consideration of reliance on Public-Private agreements and interagency agreements.

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#3. Nav. Canal "Option 3A" A+D+E+F+G+H	\$\$\$\$	\$\$\$	●	●●●●●	●●	●●●●	●●
#4. Nav. Canal "Option 3B" A+D+E+F+G+H	\$\$\$\$	\$\$\$	●	●●●●●	●●	●●●●	●●
#5. Storm Drains w/ Elev. A+D+E+G+H	\$\$\$	\$\$\$\$	●●●	●●●●	●	●	●●●●●
#6. Storm Drains w/o Elev. + Pumps A/B+C+G+H+I	\$\$\$	\$\$\$\$	●●●●	●●●●	●	●	●●●●●

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Recommendation: Coastal Barriers (Dunes)



- Prevents direct seawater flow over land.
- Reduces tidal flooding.

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Recommendation: Elevate Key Access Routes



- Prioritize improvements on along key access routes.
- Reduces tidal flooding.

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Recommendation: Upgrade Stormwater Conveyance w/ Linear Park Canal



- Reduces rainfall flooding.

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Recommendation: Backflow Prevention (Lower Elev. Potential)



- Elevation of private properties and some streets may not be feasible in some areas.
- Mobile or permanent pump systems would be required to manage rainfall during higher tides.

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Recommendation: Backflow Prevention (Higher Elev. Potential)

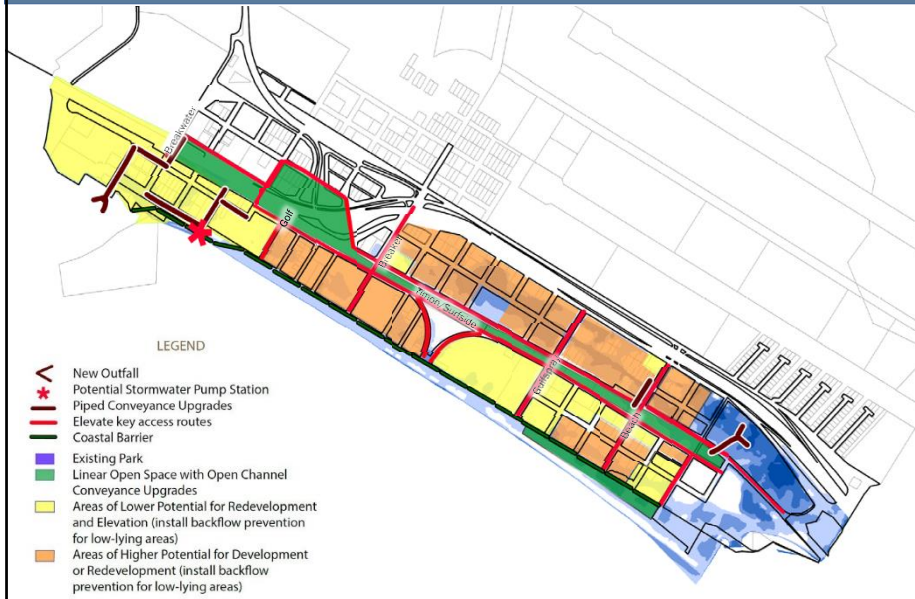


- Phase additional infrastructure elevation with adjacent private property elevation.
- Short-term improvements include installing backflow prevention and eliminating low points of existing streets.

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Implementation



- Confirm desired level of protection
- Identify long-term revitalization plan and multimodal transportation needs
- Implement short term elevation and conveyance design and phasing
- Develop long term plan for low lying areas
- Implement Sediment Monitoring and Cleaning Program

*All steps include communication with public and stakeholders

Linear Open Space + Open Channel



Emerging Design Guidelines

- Pedestrian connectivity to the beach
- Overall multi-modal connectivity
- Interest and attraction at varying tidal levels
- Accommodation for kayaking and paddle boats
- Areas that could allow future expansion into canal
- Water quality

Initial Funding Plan

Available Budget: \$9.55M (Bond 2018 + ARPA + FY23 General Fund)*

First Priority (Gulfspray and Beach)

- Elevate Beach Ave and Gulfspray. Elevate beach access parking and provide pedestrian access to beachwalk.

Second Priority (Design and Partial Construction of Linear Open Space Channel)

- Elevate Timon and Surfside, Eco Park and Dolphin Park access (Sandbar Avenue).
- Limited conveyance improvements along elevated streets.
- Install new north-end outfall and portion of linear open-space open channel.
- Confirm compatibility with future linear open-space open channel.

*Available Budget:

ARPA	\$5.00M
Bond 2018 - Beach Avenue	\$1.00M
Bond 2018 - Gulfspray Pedestrian Access	\$0.30M
Bond 2018 - NB Primary Access Project	\$1.25M
FY 2023 General Fund	\$2.00M

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Recommendation

- Use a layered solution across the North Beach peninsula
- Approve Linear Park (Option 2) and Storm Drains w/o Elevation (Option 6)
- Install Coastal Barriers (Dunes)
- Elevate Key Access Routes
- Upgrade Stormwater Conveyance w/ Linear Park Canal
- Exercise Backflow Prevention
- Next Step: Hire an engineering firm to design the linear park and reconstruct North Beach roadways utilizing available funds

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