CORPUS CHRISTI – NORTH BEACH

Strategic Development Plan – Preferred Drainage Improvement Project Summary

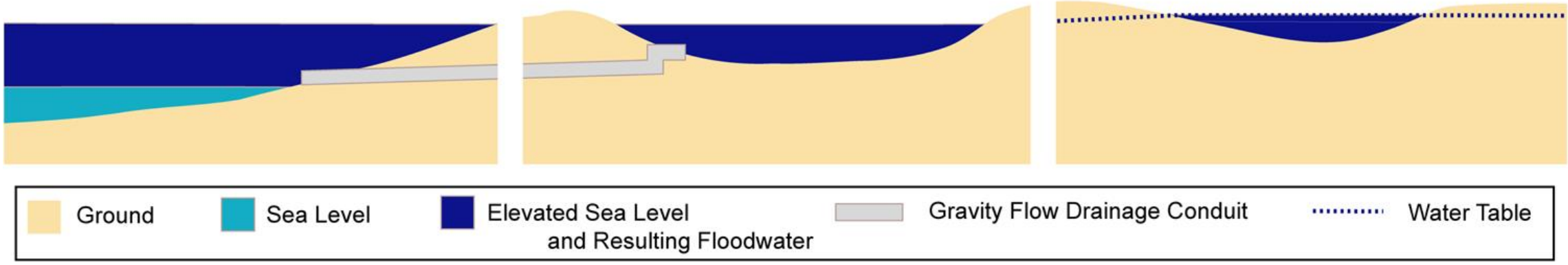
MIG

CHALLENGES – SEA LEVEL

Direct Tidal Flooding

Direct Backflow Flooding

Groundwater Seepage Flooding



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

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.

Vulnerabilities

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

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

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. G+H. "Stormwater Convey. + Ditch Imp." Option 1				✪✪✪
#2. A+D+E+F+G+H. "Linear Park" Option 2	✪✪✪✪✪	✪✪✪✪✪	✪✪✪✪✪	✪✪✪✪✪
#3. A+D+E+F+G+H "Nav. Canal" Option 3A	✪✪✪✪✪	✪✪✪✪✪	✪✪✪✪✪	✪✪✪✪✪
#4. A+D+E+F+G+H "Nav. Canal" Option 3B	✪✪✪✪✪	✪✪✪✪✪	✪✪✪✪✪	✪✪✪✪✪
#5. A+D+E+G+H "Storm Drains w/ Elev."	✪✪✪✪✪	✪✪✪✪✪	✪✪✪✪✪	✪✪✪✪✪
#6. A/B+C+G+H+I "Storm Drains w/o Elev. + Pumps"	✪✪✪✪✪	✪✪✪✪✪	✪✪✪✪✪	✪✪✪✪✪

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. A+D+E+F+G+H. "Linear Park" Option 2	$$	$$	✪✪✪	✪✪✪✪✪	✪✪✪✪✪	✪✪✪✪✪	✪✪✪✪
#3. A+D+E+F+G+H "Nav. Canal" Option 3A	$$$$	$$$	✪	✪✪✪✪✪	✪✪	✪✪✪✪	✪✪
#4. A+D+E+F+G+H "Nav. Canal" Option 3B	$$$$	$$$	✪	✪✪✪✪✪	✪✪	✪✪✪✪	✪✪
#5. A+D+E+G+H "Storm Drains w/ Elev."	$$$	$$$$	✪✪✪	✪✪✪✪	✪	✪	✪✪✪✪✪
#6. A/B+C+G+H+I "Storm Drains w/o Elev. + Pumps"	$$$	$$$$$	✪✪✪✪	✪✪✪✪	✪	✪	✪✪✪✪✪

* 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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#2. A+D+E+F+G+H. "Linear Park" Option 2	$$	$$	✪✪✪	✪✪✪✪✪	✪✪✪✪✪	✪✪✪✪✪	✪✪✪✪
#3. A+D+E+F+G+H "Nav. Canal" Option 3A	$$$$	$$$	✪	✪✪✪✪✪	✪✪	✪✪✪✪	✪✪
#4. A+D+E+F+G+H "Nav. Canal" Option 3B	$$$$	$$$	✪	✪✪✪✪✪	✪✪	✪✪✪✪	✪✪
#5. A+D+E+G+H "Storm Drains w/ Elev."	$$$	$$$$	✪✪✪	✪✪✪✪	✪	✪	✪✪✪✪✪
#6. A/B+C+G+H+I "Storm Drains w/o Elev. + Pumps"	$$$	$$$$$	✪✪✪✪	✪✪✪✪	✪	✪	✪✪✪✪✪

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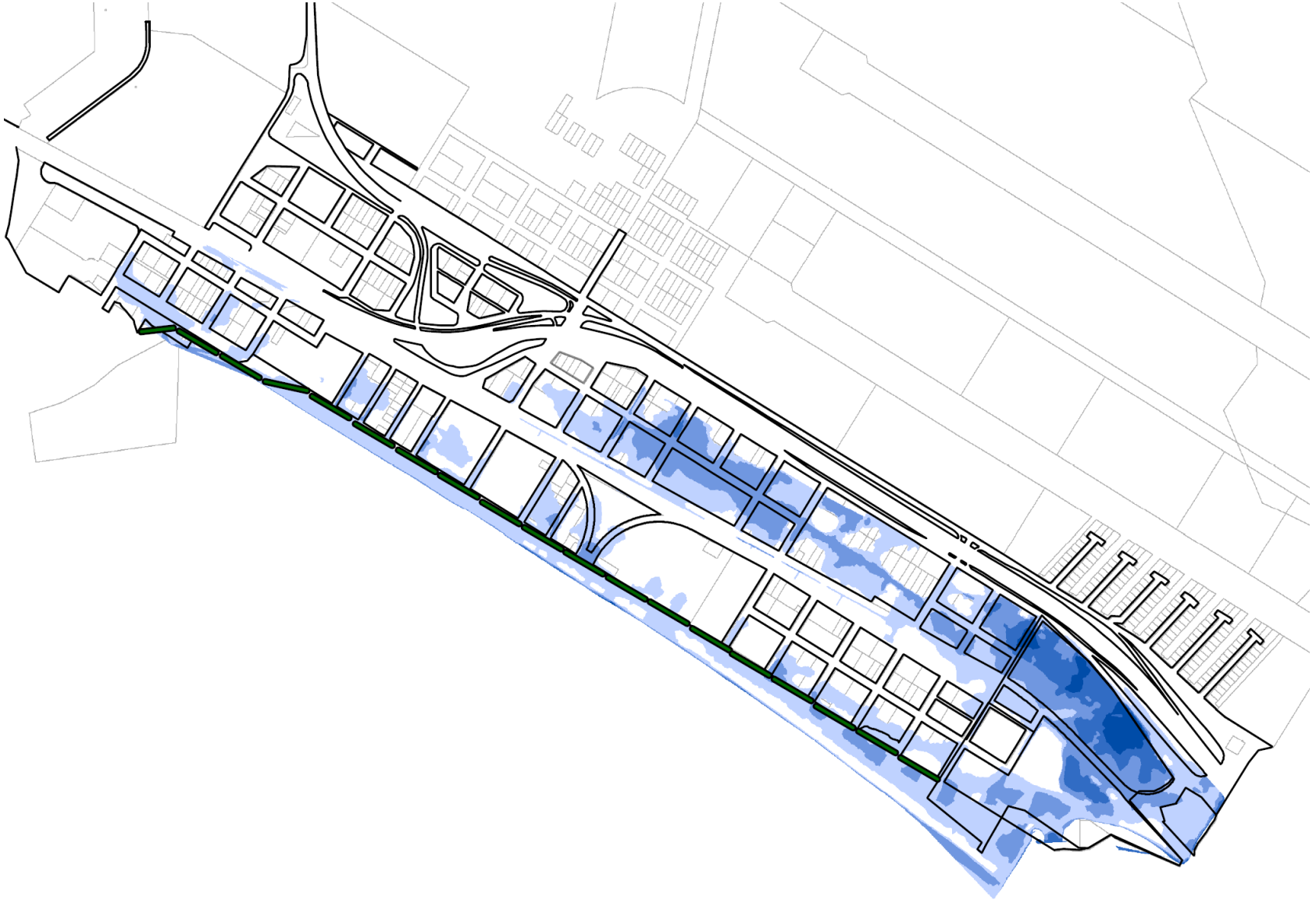
Coastal Barriers (Dunes)



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

Elevate Key Access Routes

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

Upgrade Stormwater Conveyance

- Reduces rainfall flooding.

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.

Backflow Prevention (Higher Elev. Potential)

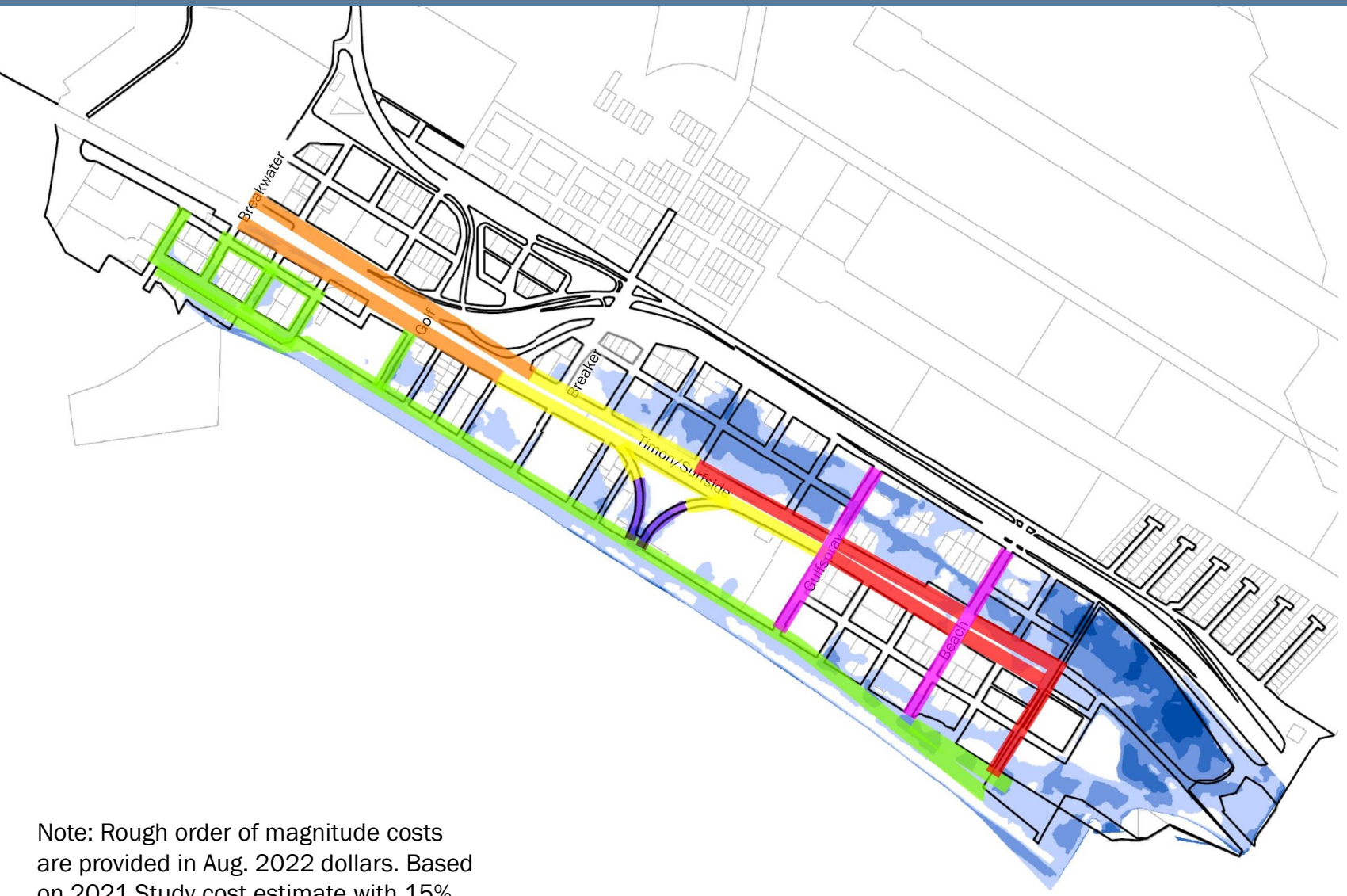
- Phase additional infrastructure elevation with adjacent private property elevation.
- Short-term improvements include installing backflow prevention and eliminating low points of existing streets.

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

Prioritization



$4.5M Elevate. In-progress.

$2.5M Elevate.

$5M Elevate and reconstruct. Limited conveyance improvements.

$10M Elevate. Major conveyance improvements, portion of linear open-space, new south-end outfall. Backflow prevention.

$5M Elevate. Connect linear open-space.

$16M Permanent or mobile pump station locations. Piped conveyance. Coastal barrier (dunes).

- Not Shown - Future Phases. Elevation and/or additional pump station locations.

Note: Rough order of magnitude costs are provided in Aug. 2022 dollars. Based on 2021 Study cost estimate with 15% cost escalation since Feb. 2021.

American Rescue Plan (Prelim. Scope)

Available Budget: $6.3M (Bond 2018 + ARPA)*

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.
- 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

Recommendation

Approve the North Beach Drainage Improvement Project
as part of the FY 23 Capital Budget