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



## CHALLENGES – SEA LEVEL





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**







#### **G. IMPROVE PIPED CONVEYANCE**







#### I. STORMWATER PUMPS



### **Intervention Effectiveness**

Intervention(s)	Direct Tidal Flooding	Backflow Flooding Groundwater Seepage Flooding		Rainfall Induced Flooding	
A. Dunes	0000				
B. Seawall	0000		000		
C. Tide Gates/Valves		0000			
D. Elevate Infrastructure	000	000	000	00	
E. Elevate Parcels	000	000	000	00	
F. Open Channel Convey.				00	
G. Imp. Closed Convey.				00	
H. Sed. Monitoring + Clean.				0	
I. Stormwater Pumps			000	000	
#1. G+H. "Stormwater Convey. + Ditch Imp." Option 1				000	
#2. A+D+E+F+G+H. "Linear Park" Option 2	00000	00000	00000	00000	
#3. A+D+E+F+G+H "Nav. Canal" Option 3A	00000	00000	00000	00000	
#4. A+D+E+F+G+H "Nav. Canal" Option 3B	00000	00000	00000	00000	
#5. A+D+E+G+H "Storm Drains w/ Elev."	00000	00000	00000	00000	
#6. A/B+C+G+H+I "Storm Drains w/o Elev. + Pumps"	00000	00000	00000	00000	

## **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
<b>#2. A+D+E+F+G+H.</b> "Linear Park" Option 2	\$\$	\$\$	000	00000	00000	00000	0000
<b>#3. A+D+E+F+G+H</b> "Nav. Canal" Option 3A	\$\$\$\$	\$\$\$	o	00000	00	0000	00
<b>#4. A+D+E+F+G+H</b> "Nav. Canal" Option 3B	\$\$\$\$	\$\$\$	0	00000	00	0000	00
<b>#5. A+D+E+G+H</b> "Storm Drains w/ Elev."	\$\$\$	\$\$\$\$	000	0000	٥	C	00000
<b>#6. A/B+C+G+H+I</b> "Storm Drains w/o Elev. + Pumps"	\$\$\$	\$\$\$\$\$	0000	0000	O	C	00000

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

## **Decision Criteria**

<b>#2. A+D+E+F+G+H.</b> "Linear	Cost \$\$	Maintenance	Accelerated Delivery Timeframe	Economic Dev.	Cology Cology	<ul> <li>Cocal Oriented</li> <li>Amenity</li> <li>/Recreation</li> <li>/Openspace</li> </ul>	Connectivity
Park" Option 2							
<b>#3. A+D+E+F+G+H</b> "Nav. Canal" Option 3A	\$\$\$\$	\$\$\$	0	00000	00	0000	00
<b>#4. A+D+E+F+G+H</b> "Nav. Canal" Option 3B	\$\$\$\$	\$\$\$	0	00000	00	0000	00
<b>#5. A+D+E+G+H</b> "Storm Drains w/ Elev."	\$\$\$	\$\$\$\$	000	0000	٥	0	00000
<b>#6. A/B+C+G+H+I</b> "Storm Drains w/o Elev. + Pumps"	\$\$\$	\$\$\$\$\$	0000	0000	0	0	00000

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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



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