

Public Scoping Meeting

Westminster East Garden Grove, California

Flood Risk Management Feasibility Study



Westminster, East Garden Grove, CA
Flood Risk Management Feasibility Study



US Army Corps
of Engineers.



AGENDA

Orange County Public Works

U.S. Army Corps of Engineers

- Study area problems & context
- Inventory of existing conditions
- Plan formulation process
- Plan evaluation
- Environmental analysis

Schedule and Next Steps

Discussion

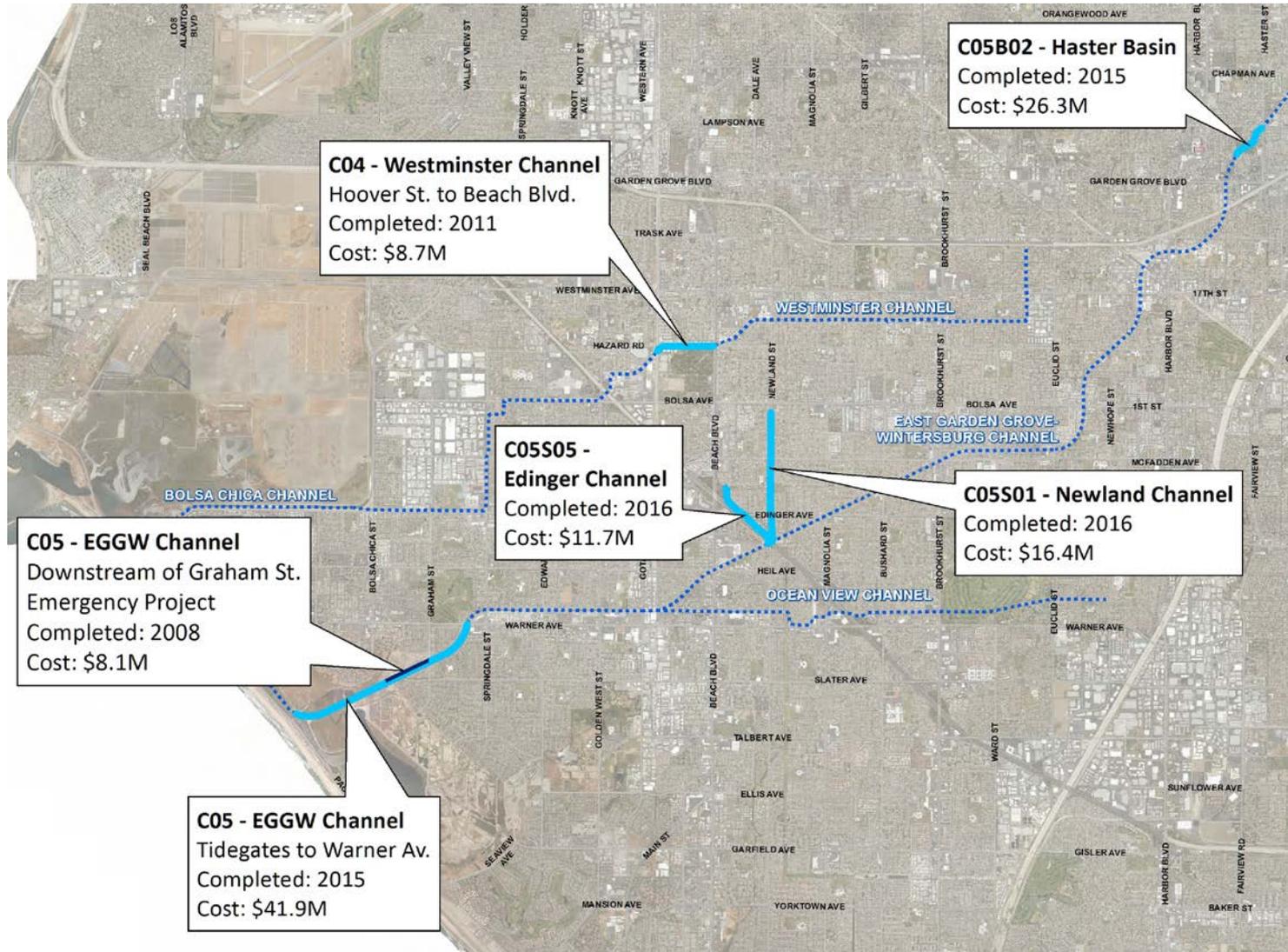


ORANGE COUNTY FLOOD CONTROL DISTRICT

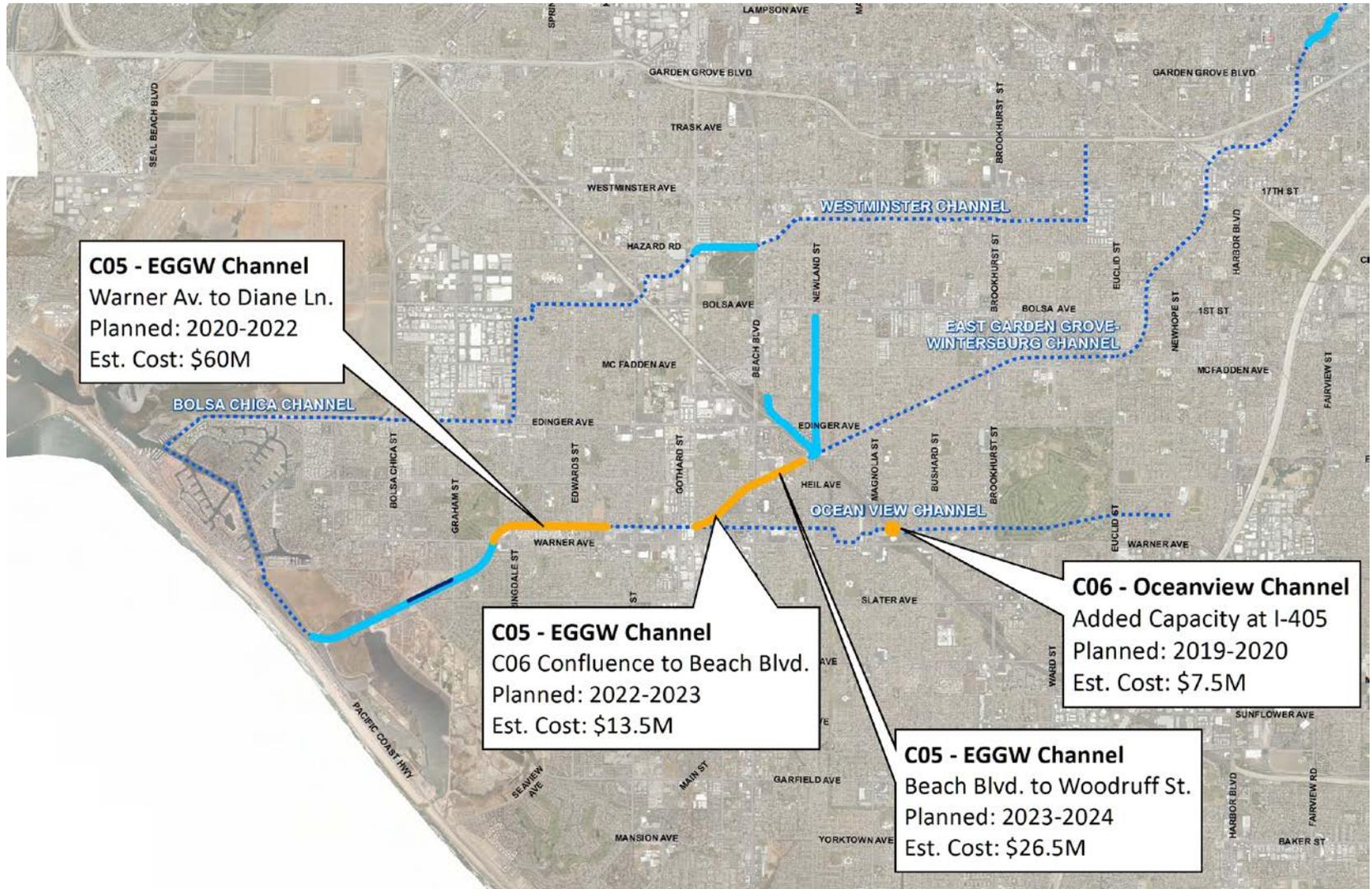
- Authority
 - Orange County Flood Control Act of 1927
 - “An Act to create a flood control district...to provide for the control and conservation of flood and storm waters, and for the construction of works and the acquisition of property therefor...”
 - Governed by the Board of Supervisors of Orange County
 - Primarily the responsibility of OC Public Works
-  **Public Works** Flood Risk Objective
 - To provide 100-year flood protection to all residents of Orange County



PROJECTS COMPLETED SINCE 2003



PROJECTS PLANNED TO BE COMPLETED BY OCPW



U.S. ARMY CORPS OF ENGINEERS

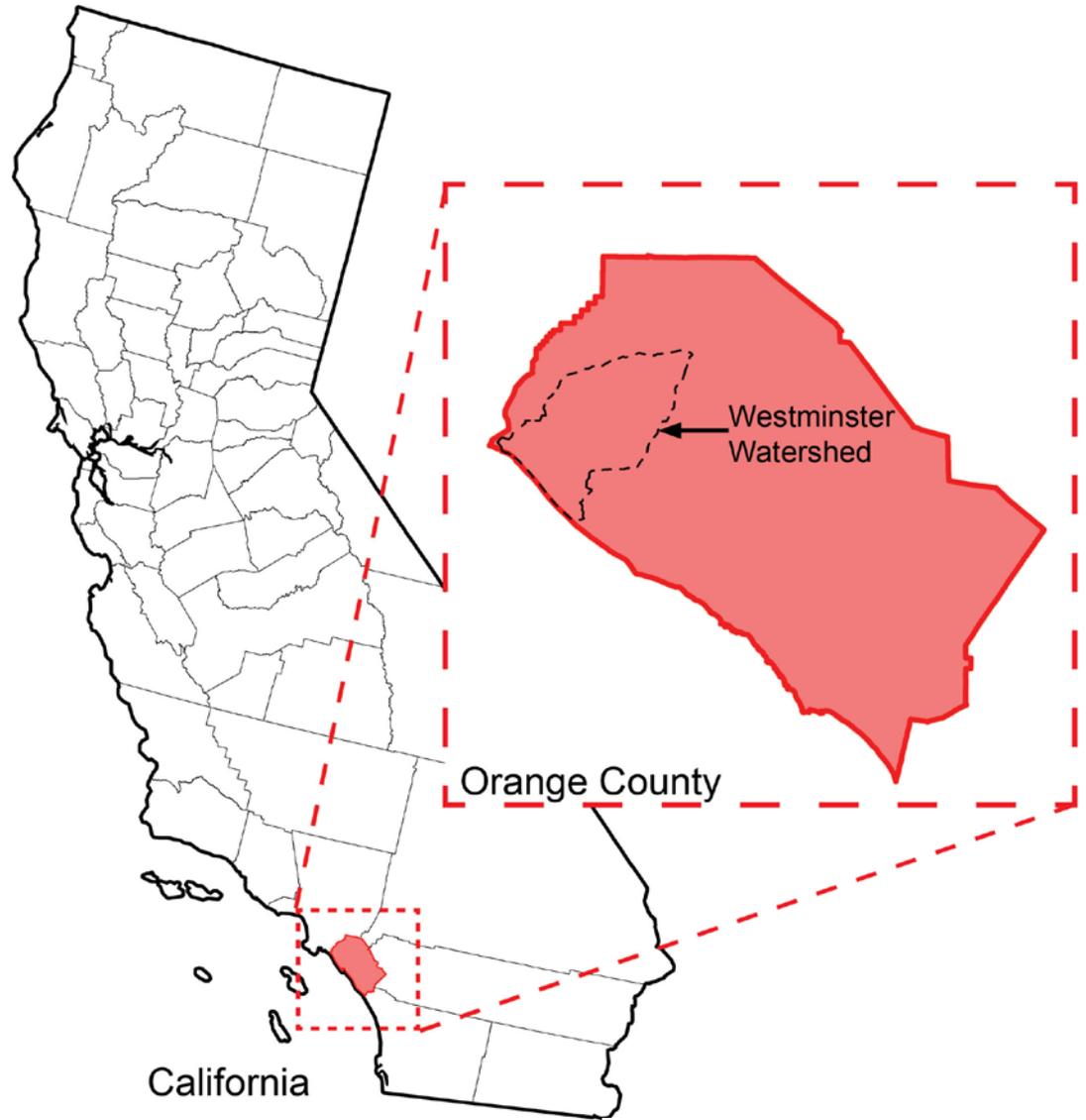
- Authority
 - House of Representatives Committee on Public Works May 8, 1964 (Flood Control Act of 1938)
 - “...the Board of Engineers for Rivers and Harbors is hereby requested to review the reports on (a) San Gabriel River and Tributaries, published as House Document No. 838, 76th Congress, 3d Session; (b) Santa Ana River and Tributaries, published as House Document No. 135, 81st Congress, 1st Session; **and (c) the project authorized by the Flood Control Act of 1936 for the protection of the metropolitan area in Orange County, with a view to determining the advisability of modification of the authorized projects in the interest of flood control and related purposes.**”
- Study Objective
 - To identify a plan that addresses flood risk and also maximizes the total net benefits (benefits – costs).

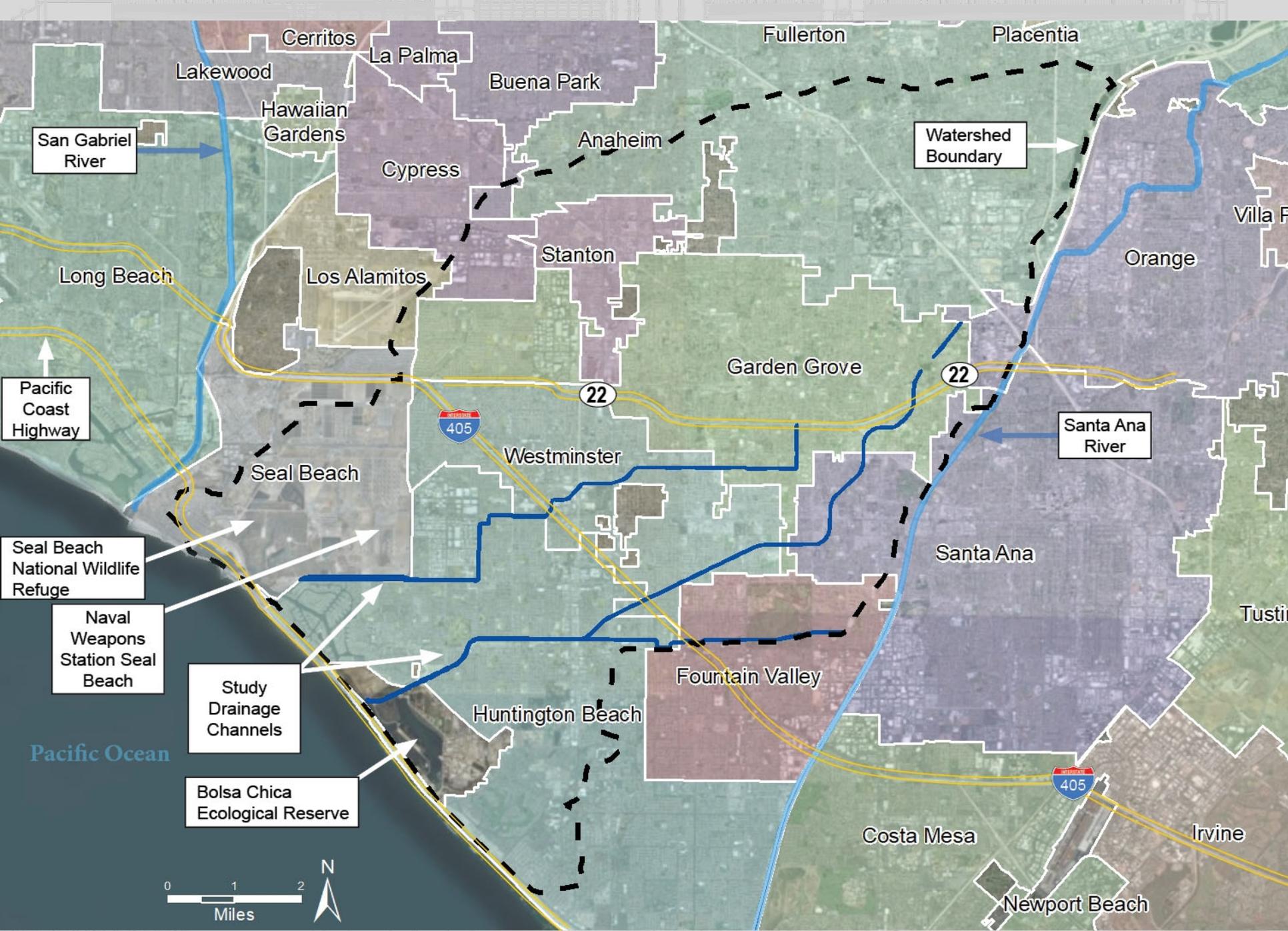


STUDY AREA

Westminster Watershed Orange County, CA

- 87 square miles
- 400,000 residents
- 44,000 structures
- Dense urban land use
- 25 miles of flood control channels
- Connects to Pacific Ocean at Anaheim Bay
- 199 acres of freshwater wetland
- 32 acres of marine wetland

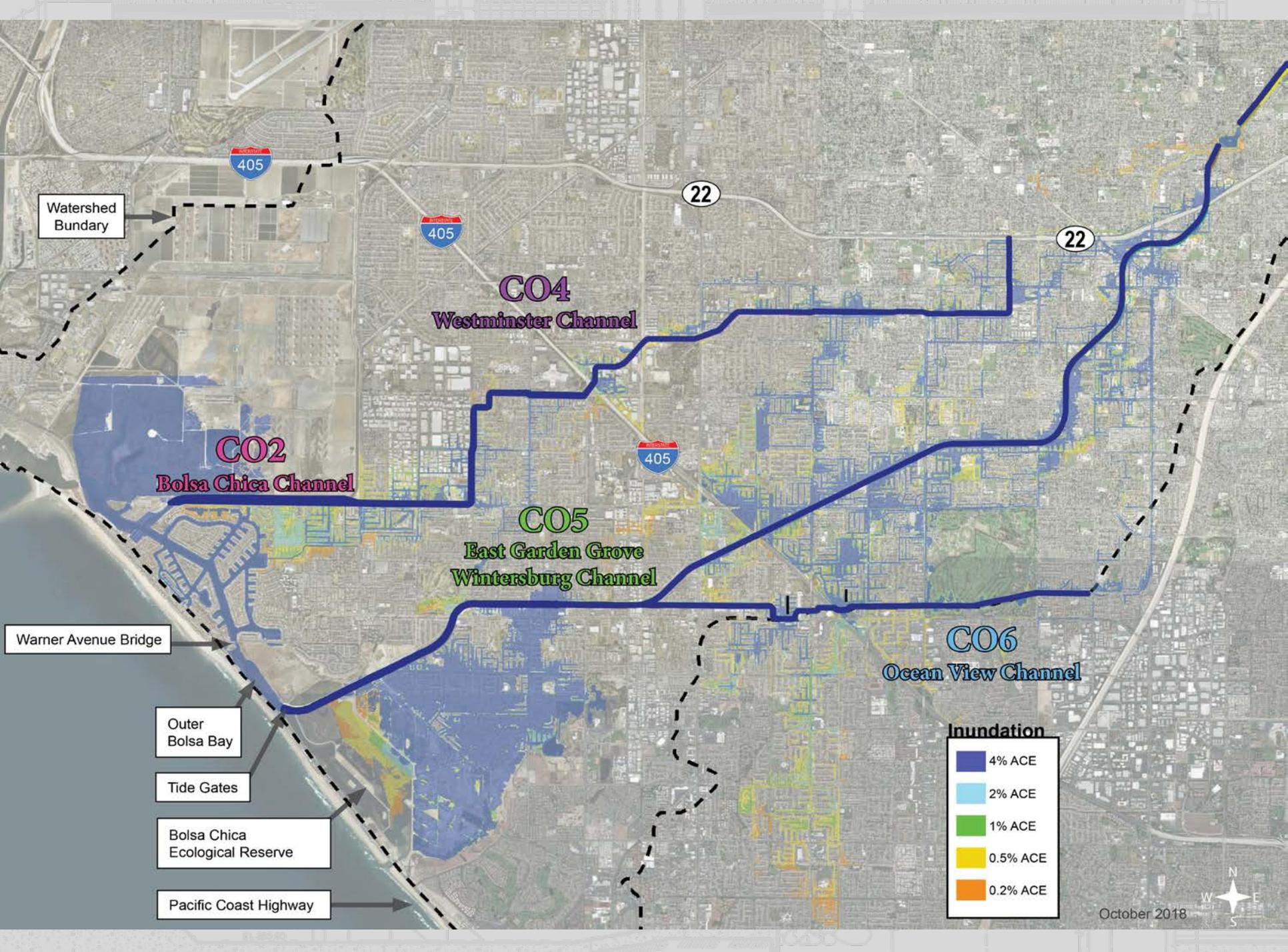




STUDY AREA PROBLEMS

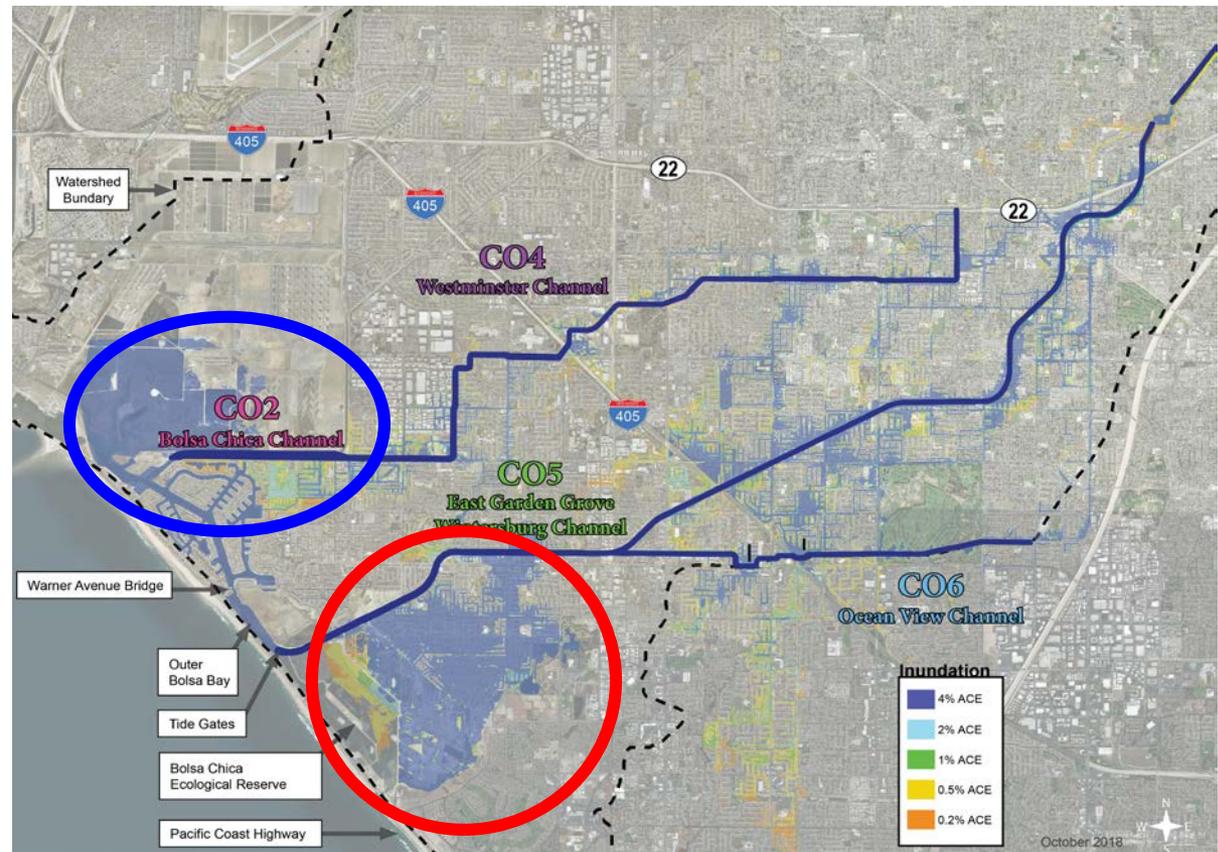
- **Drainage channels don't have the needed capacity**
- **Highly urbanized (impermeable surfaces)**
 - Damages to property, businesses, and infrastructure
 - Regional traffic delays
 - Risks to life safety
 - Risks to sensitive ecological areas



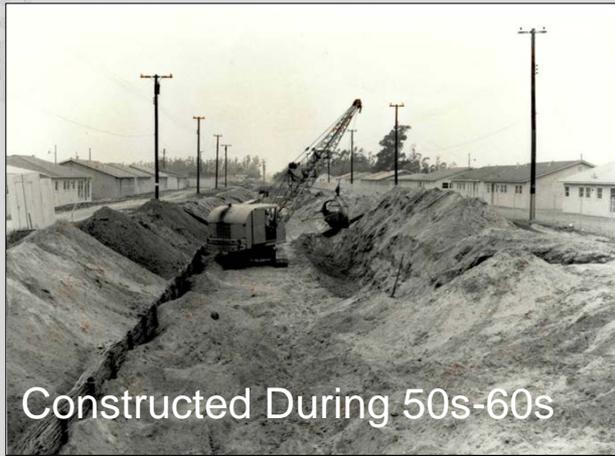


STUDY AREA PROBLEMS

- Widespread flooding may occur during moderate storm events
 - ~3700 structures and ~\$90M annual damages
- Traffic Impact
 - The 405, Garden Grove Fwy, PCH
 - Local roads
- C02 and C05 levees may breach and overtop into sensitive areas
 - **C02** - Seal Beach National Wildlife Refuge
 - **C05** - Bolsa Chica Ecological Reserve



EXISTING CHANNEL CONDITIONS



Constructed During 50s-60s



Earthen Trapezoidal



Riprap Trapezoidal

Over time, OCPW has modified some reaches:



Concrete Trapezoidal



Concrete Rectangular



Steel Sheet Pile

EXISTING DOWNSTREAM CONDITIONS

Warner Avenue Bridge

- Existing bottleneck
- Causes backwater flooding upstream in C05 and OBB



Pacific Coast Highway

- Flooding exacerbated under high tide conditions
- Erosion from flood flows



Tide Gates

- Existing bottleneck
- Causes backwater flooding in C05
- Currently 'leak' – saltwater habitat



PLANNING PROCESS (1/5)

**Inventory and
Forecast Existing
Conditions**

**Plan Formulation
and Selection**

**Hydraulic
Modeling**

**Economic
Damages**

**Alternative
Plans**

**Compare
& Select**



PLANNING PROCESS (2/5)

1. Hydraulic Modeling

Determine extent of expected flooding

- Existing and with-project conditions
- Multiple storm events



PLANNING PROCESS (3/5)

2. Economic Damages

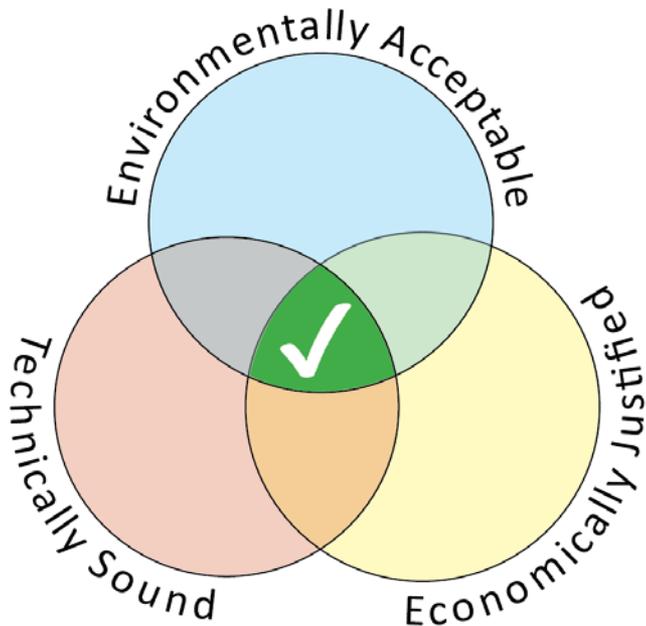
Run economic models to forecast impacts of flooding using depth-damage correlations

- Structure inventory
- Structure contents
- Traffic delays



PLANNING PROCESS (4/5)

3. Alternative Plans



Potential plans to reduce flood risk must be technically sound, environmentally acceptable, and economically justified

- Combinations of management measures
- Evaluated with hydraulic & economic models

PLANNING PROCESS (5/5)

4. Compare & Select

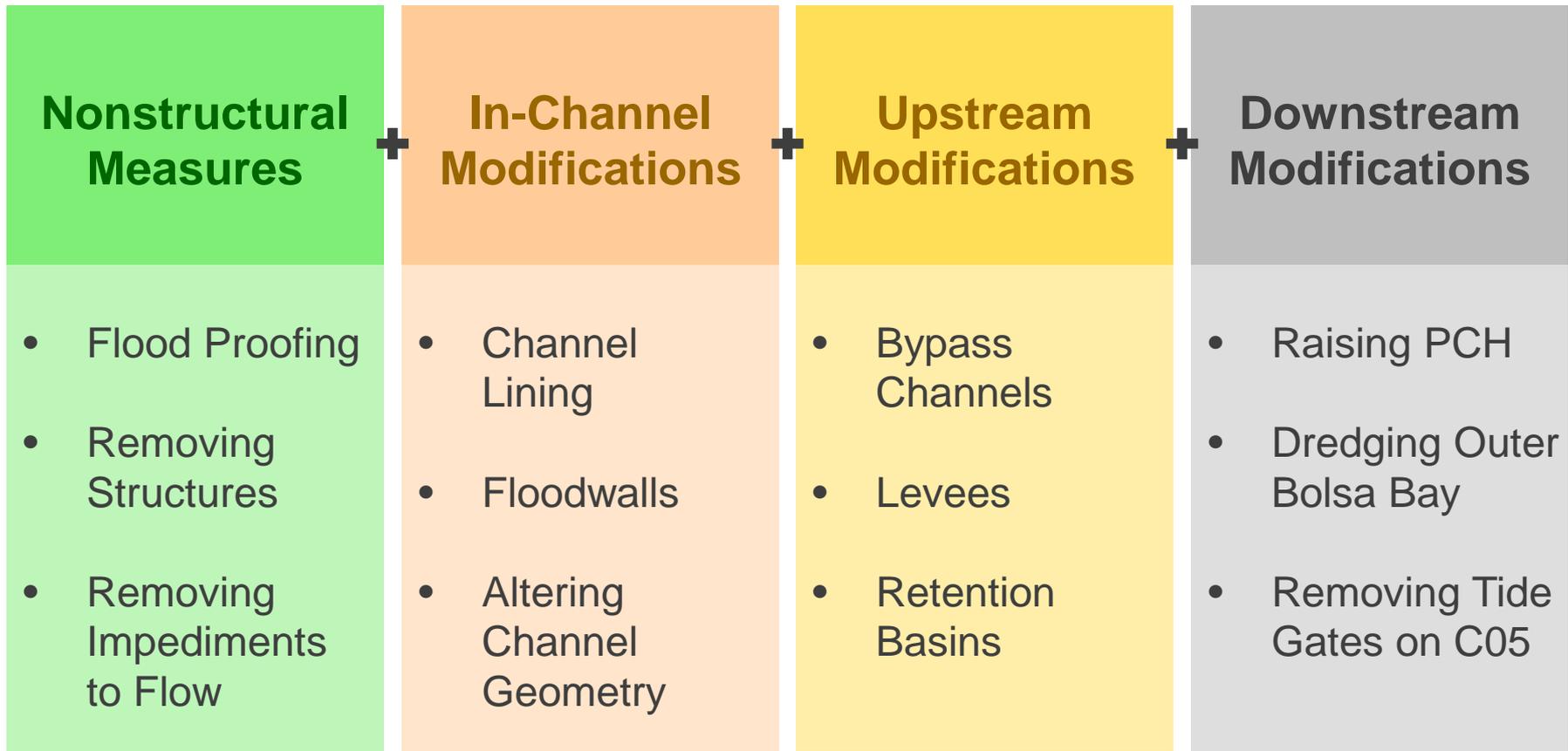
USACE selects the alternative plan the maximizes net benefits

- Benefits = avoided damages
- Net benefits = benefits – cost
- Greatest net benefits is called the National Economic Development Plan (NED)
- Or identify a Locally Preferred Plan (LPP)



MANAGEMENT MEASURES

A feature or activity that can be implemented to address one or more planning objective.



MANAGEMENT MEASURES

Measures		Retained	Screened Out
Nonstructural Measures	Floodplain Regulation	-	X
	Emergency Response	-	X
	Evacuation Planning	-	X
	Flood Proofing	-	X
	Flood Warning System	X	-
	Razing/Removing Structures	-	X
	Removal of Impediments to Flow	X	-
In-Channel Modifications	Lining Channels with Concrete	X	-
	Altering Channel Geometry	X	-
	Flood walls	X	-
	Pump Station Improvements	-	X
	Construct new ocean outlet (approx. 30' diam. tunnel)	-	X
Upstream Modifications	Diversion/Bypass Channels	X	-
	Storage/Retention Basins	-	X
	Dams	-	X
	Levees	-	X
	Santa Ana River (SAR) Diversion	-	X
Downstream Modifications	Raising Pacific Coast Highway (PCH)	-	X
	Constructing a Floodwall along Pacific Coast Highway (PCH)	X	-
	Removing Tide Gates on CO5	-	X
	Reconstructing/Relocating Tide Gates on CO5	X	-
	Widening the Existing Bottleneck at Warner Avenue	X	-
	Dredging in Outer Bolsa Bay	-	X
	Intentional Breaching of the Levee on CO5 Adjacent to the Muted Tidal Pocket	-	X



ARRAY OF ALTERNATIVES

Minimum Channel Modifications

- Increase efficiency
- Improve channel lining materials



Maximum Channel Modifications

- Increase efficiency and capacity
- Modify channel lining and geometry
- Contain 100-year storms



OR



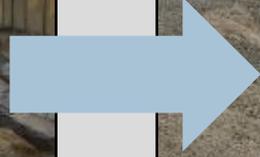
Moderate Channel Modifications (Hybrid Plan)

- Increase efficiency and capacity
- Channel lining and geometry
- Incremental analysis



MINIMUM CHANNEL MODIFICATIONS PLAN

Minimum Channel Modifications



Downstream Modifications



Expand Warner Ave. Bridge



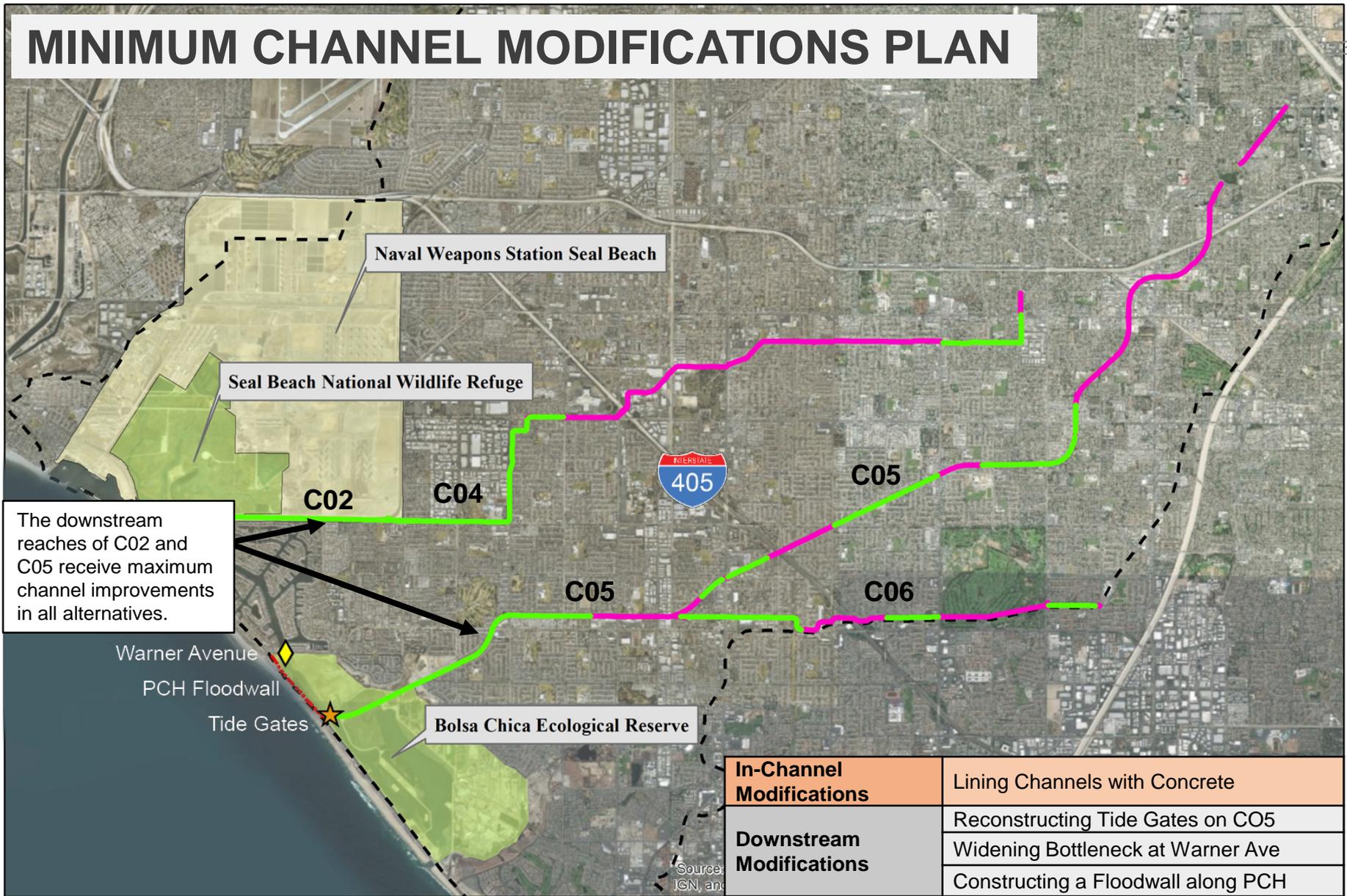
PCH Floodwall



Replace Tide Gates



MINIMUM CHANNEL MODIFICATIONS PLAN

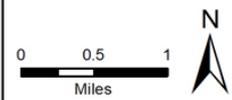


The downstream reaches of C02 and C05 receive maximum channel improvements in all alternatives.

In-Channel Modifications	Lining Channels with Concrete
Downstream Modifications	Reconstructing Tide Gates on C05
	Widening Bottleneck at Warner Ave
	Constructing a Floodwall along PCH



— Pave existing channels with concrete
 — No modification of channels



Westminster, East Garden Grove FRM For Official Use Only
 Minimum Channel Modifications November 2018

MAXIMUM CHANNEL MODIFICATIONS PLAN

Maximum Channel Modifications



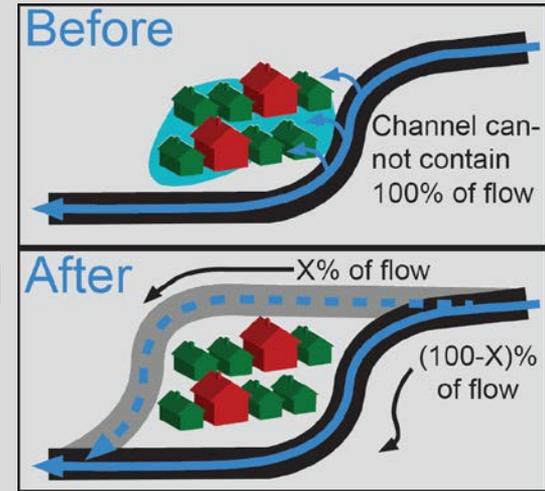
Before



After



After



Bypass Channel

Downstream Modifications



Expand Warner Ave. Bridge



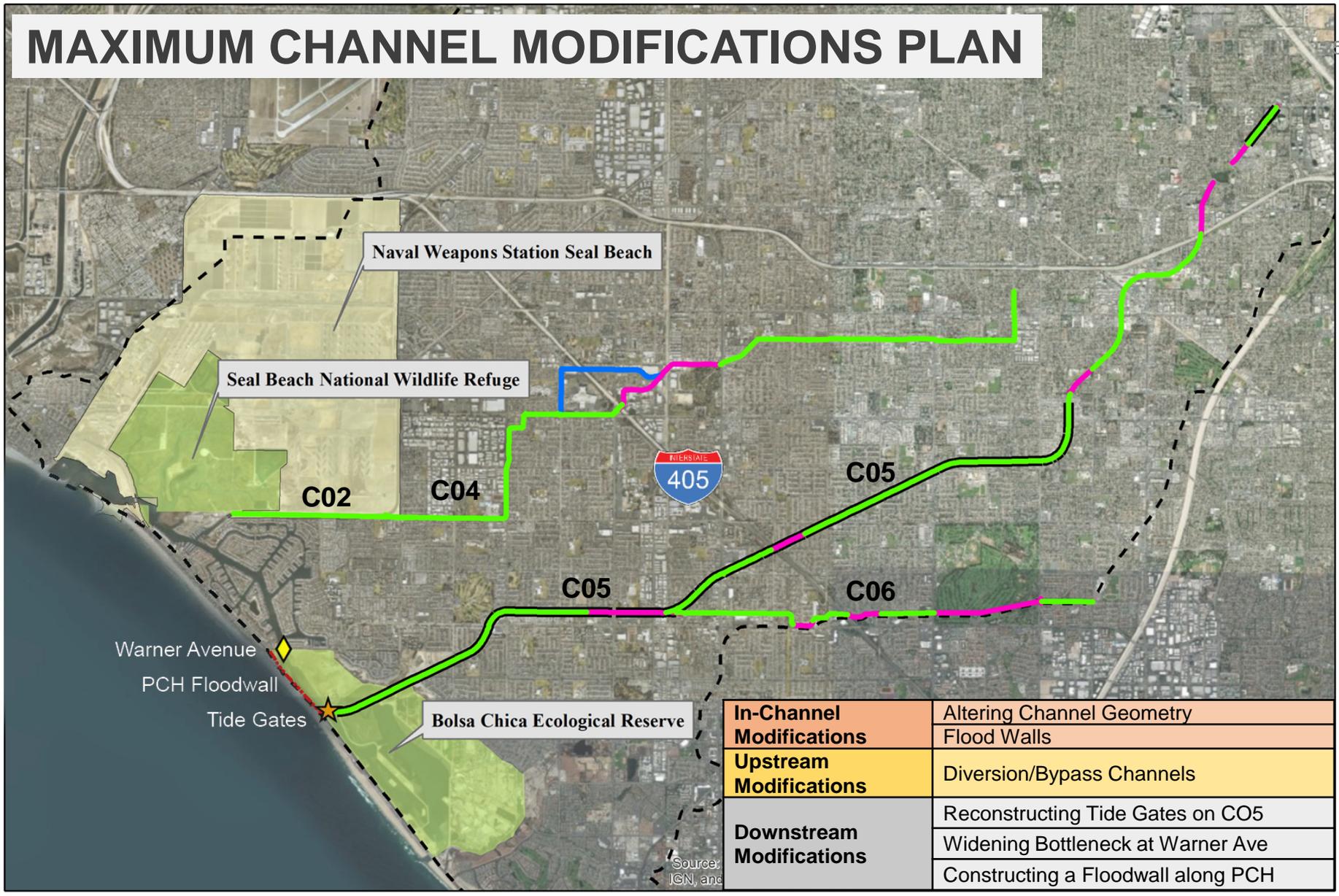
PCH Floodwall



Replace Tide Gates



MAXIMUM CHANNEL MODIFICATIONS PLAN



PRELIMINARY NATIONAL ECONOMIC DEVELOPMENT & LOCALLY PREFERRED PLANS

NED/LPP	Plan Name	Total First Cost (\$1,000)	Preliminary Equivalent Average Annual Values			
			Benefits (\$1,000)	Costs (\$1,000)	Net Benefits (\$1,000)	BCR
Apparent NED	Minimum Channel Modifications	\$823,500	\$145,300	\$43,500	\$101,800	3.3
LPP	Maximum Channel Modifications	\$1,476,000	\$160,500	\$74,400	\$86,100	2.2

Apparent NED Plan is subject to change based upon subsequent detailed analysis and design.

1 - Dollars are expressed in 2019 Price Levels, assuming a base year of 2035, a 50 year period of analysis, and a Federal Discount Rate of 2.875%



ENVIRONMENTAL ANALYSIS



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ENVIRONMENTAL RESOURCES (1/2)

- 13 federally-listed species
- 77 state-listed species
- 2 Special Marine Conservation Areas
 - Bolsa Bay
 - Bolsa Chica Basin
- Potential to impact:
 - Nesting birds
 - Green sea turtle
 - Upland and adjacent fringe wetland (Warner Avenue Bridge and PCH floodwall)
 - Eelgrass (Warner Ave. Bridge)
 - In-channel wetlands/soft-bottom habitat



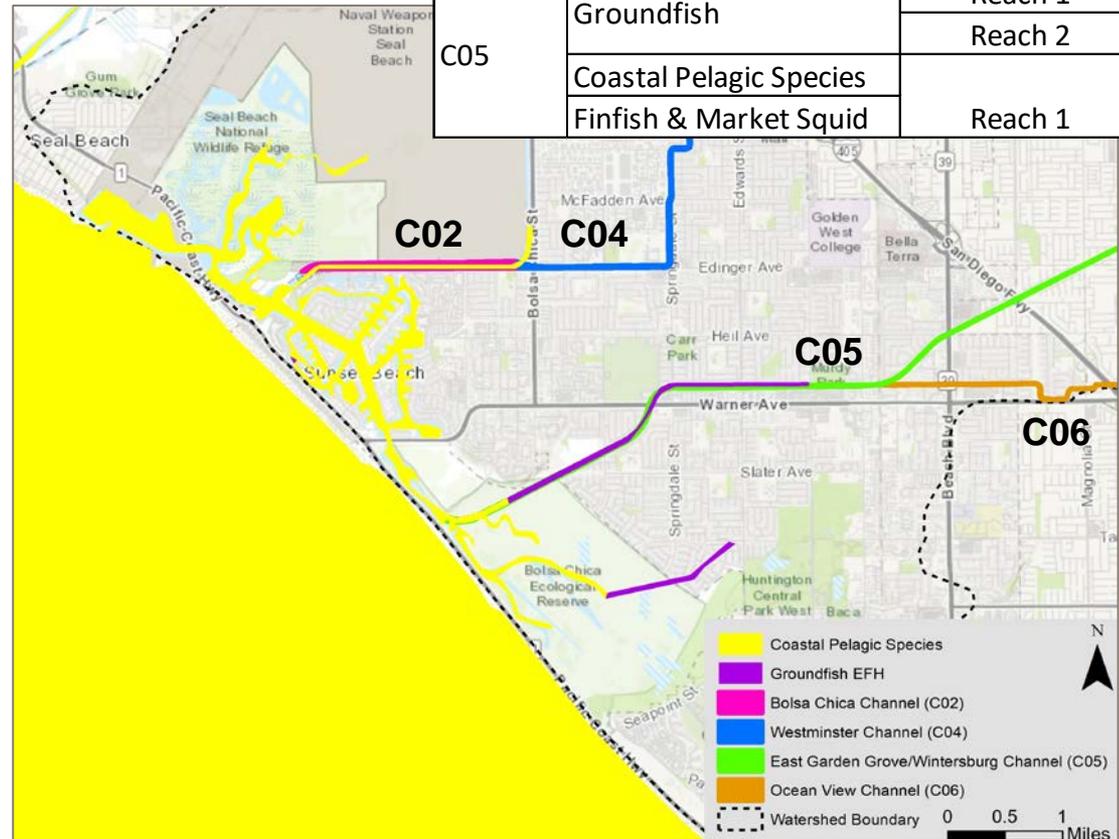
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ENVIRONMENTAL RESOURCES (2/2)

Essential Fish Habitat (EFH)

- No Pacific Salmon EFH, Habitat Areas of Particular Concern, or EFH Areas Protected from Fishing within project vicinity
- EFH for Pacific Highly Migratory Species (PHMS) located approx. 1 mile off coast
- Temporary impacts anticipated

Channel	Species	Reach with EFH
C02	Groundfish	Reach 23
	Coastal Pelagic Species	
	Finfish & Market Squid	
C05	Groundfish	Reach 1
	Coastal Pelagic Species	Reach 2
	Finfish & Market Squid	Reach 1



*Coastal Pelagic Species and Finfish & Market Squid EFH overlap on map

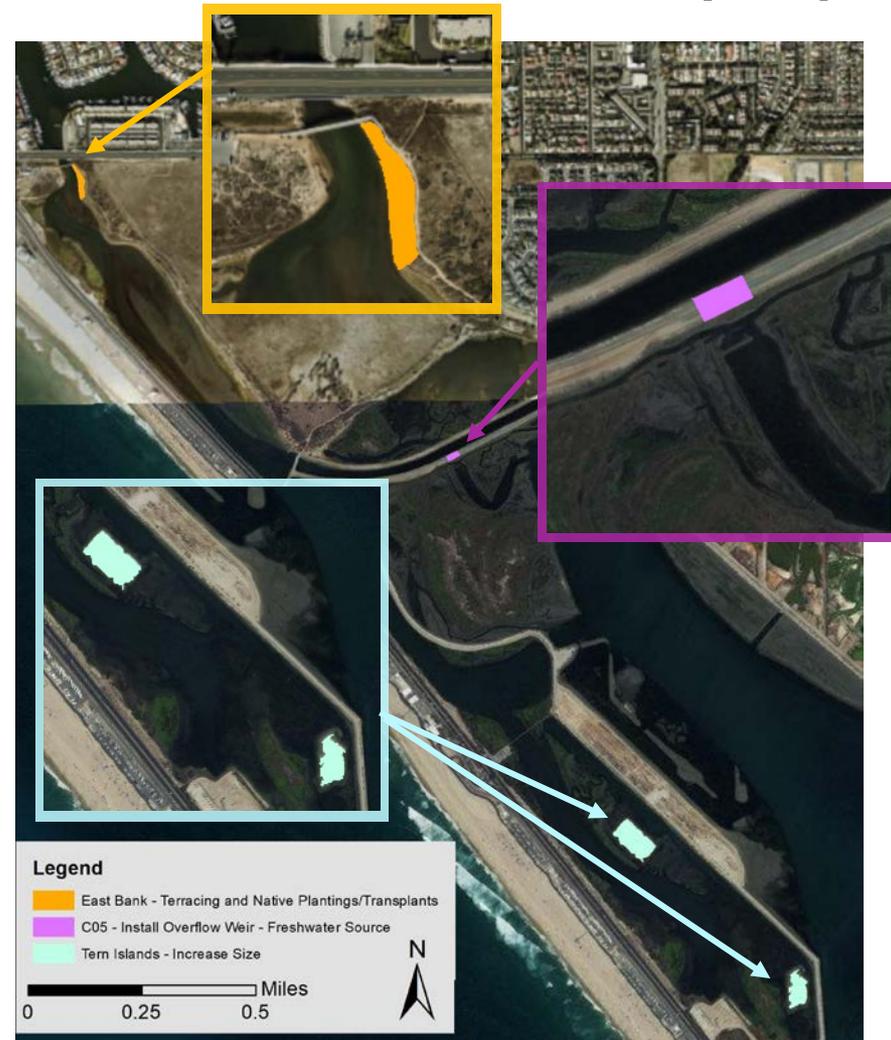
PRELIMINARY MITIGATION REQUIREMENTS (1/2)

- Goal: Offset increment of loss in fish and wildlife habitat resulting from implementation of NED or LPP
- National Economic Development Plan (NED)
 - Total preliminary mitigation requirement: ~25 acres
- Locally Preferred Plan (LPP)
 - Total preliminary mitigation requirement: ~11 acres

Alternative	Preliminary Mitigation Requirements (acres)			
	Channels		Warner Ave. Bridge	PCH Floodwall
	C02/C04	C05/C06		
NED	16.7	7.1	1.0	0.2
LPP	2.3	7.1	1.0	0.2

PRELIMINARY MITIGATION REQUIREMENTS (2/2)

- Potential mitigation opportunities at Bolsa Chica Ecological Reserve (BCER) being discussed
- 3 opportunities identified
 - East bank terracing
 - C05 overflow weir
 - Tern islands
- Mitigation Plan is being coordinated with environmental resource agencies
- Detailed analysis will be included in final report



NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)/CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

- Preliminary impacts analysis conducted
- Adopted significance thresholds from CEQA guidelines (Appendix G)

Effects NOT Found to be Significant

- Mineral resources
- Agriculture and forestry
- Land use and planning
- Population and housing
- Public services



NEPA/CEQA CONT.

- Preliminary impacts analysis conducted
- Adopted significance thresholds from CEQA guidelines (Appendix G)

Effects Found to be Significant, BUT can be reduced to less than significant with environmental commitments

- | | |
|---|---|
| <ul style="list-style-type: none">▪ Earth Resources▪ Water Resources▪ Air Quality▪ Greenhouse Gas Emissions▪ Socioeconomic /Environmental Justice | <ul style="list-style-type: none">▪ Recreation▪ Aesthetic Quality▪ Hazards & Hazardous Materials▪ Traffic and Transportation▪ Utilities and Service Systems |
|---|---|



NEPA/CEQA CONT.

- Preliminary impacts analysis conducted
- Adopted significance thresholds from CEQA guidelines (Appendix G)

Effects Found to be Significant AND Unavoidable

- Noise and vibration
- Biological resources

Ongoing Evaluation to Determine Preliminary Effects

- Cultural resources
- Tribal cultural resources

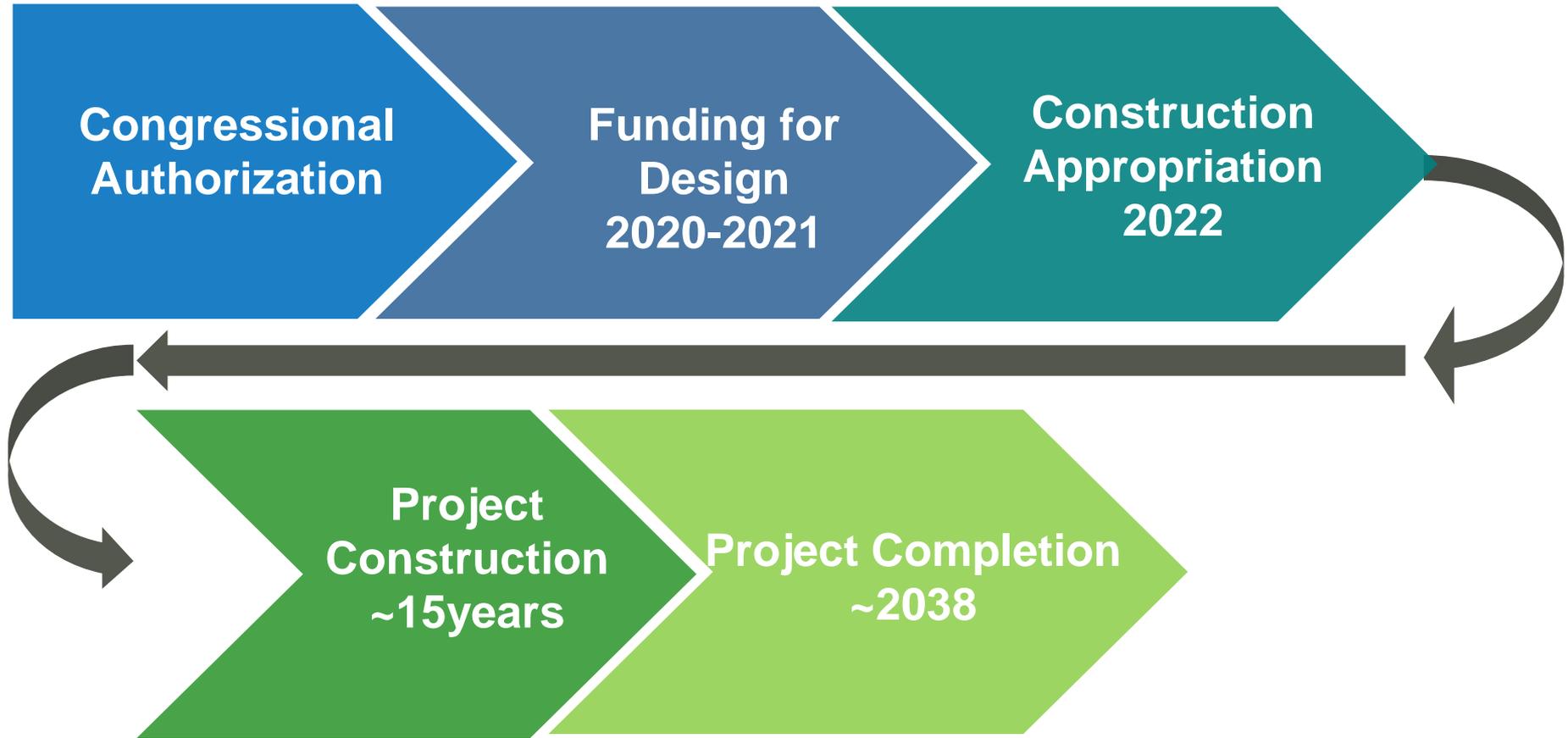


STUDY SCHEDULE

Alternatives Milestone briefing	Feb 2014
Alternatives Milestone approved	June 2014
Tentatively Selected Plan Milestone	25 Jul 2018
Draft report released – Start of public/concurrent reviews	20 Oct 2018
Public Meetings	7-8 Nov 2018
End of public/concurrent reviews	3 Dec 2018
Receipt of final IEPR Comments, when applicable	Dec 2018
Agency Decision Milestone	Jan 2019
District Engineer's transmittal of final report package	Sep 2019
Senior Leader Briefing	Dec 2019
Chief of Engineer's Report signed	Jan 2020
Record of Decision (ROD) signed	Summer 2020

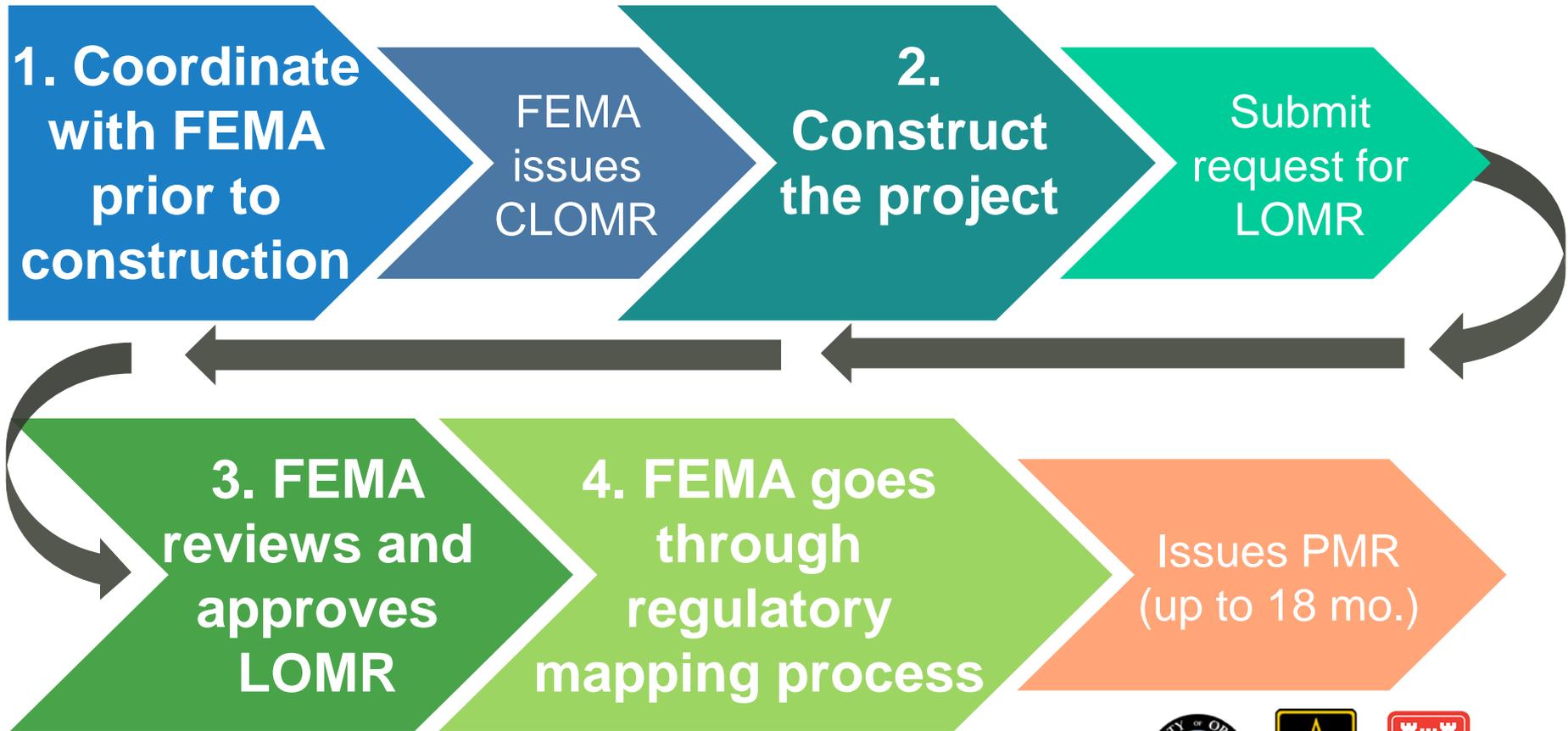


NEXT STEPS (1/2)



NEXT STEPS (2/2)

WHAT'S NEXT FOR RESIDENTS IN THE FEMA FLOODPLAIN?



QUESTIONS AND DISCUSSION

WE WANT TO HEAR FROM YOU!

<https://www.lrc.usace.army.mil/Missions/Civil-Works-Projects/Westminster-East-Garden-Grove/>

Or search Google for “USACE Westminster”

Submit your comments by DECEMBER 3, 2018:

- Spoken comments
- Handwritten comment cards
- Email westminster_comments@usace.army.mil
- Send a letter to:

Orange County Public Works
ATTN: Justin Golliher
300 N. Flower Street
Santa Ana, CA 92703

