JUNE 22, 2022

ISLAIS CREEK
SOUTHEAST MOBILITY ADAPTATION STRATEGY
LIFELINES COUNCIL MEETING

CORE TEAM:

Lisa Fisher, ICSMAS Project Director
Resilience & Sustainability Lead, Planning

Luiz Barata, ICSMAS Project Manager
City Design, Planning

Tim Doherty, *Manager: Policy and Long-Range Planning, SFMTA*

Kari Kilstrom, *Special Projects, Port*

Sarah Minick, *Utility Planning Manager, SFPUC Wastewater*

CONSULTANTS: AECOM, Pathways Climate, Fehr & Peers, Lotus Water, Civic Edge, Andrea Baker Consulting

San Francisco Planning

SFMTA

PORT OF SAN FRANCISCO

San Francisco Water Power Sewer

1. **PROJECT CONTEXT**
2. FRAMING & APPROACH
3. OVERVIEW OF STRATEGIES
4. DELIVERABLES & NEXT STEPS

Photo courtesy of the Port of San Francisco

SAN FRANCISCO **INTEGRATED CLIMATE RESILIENCE**

ECONOMIC RECOVERY

WATERFRONT RESILIENCE PROGRAM (FLOOD STUDY & SEAWALL)

STRENGTHEN ADAPT PLAN ENVISION

FUTURE WATERFRONT PLAN UPDATE

HAZARD & CLIMATE RESILIENCE PLAN

CLIMATE ACTION PLAN

ISLAIS CREEK ADAPTATION STRATEGY

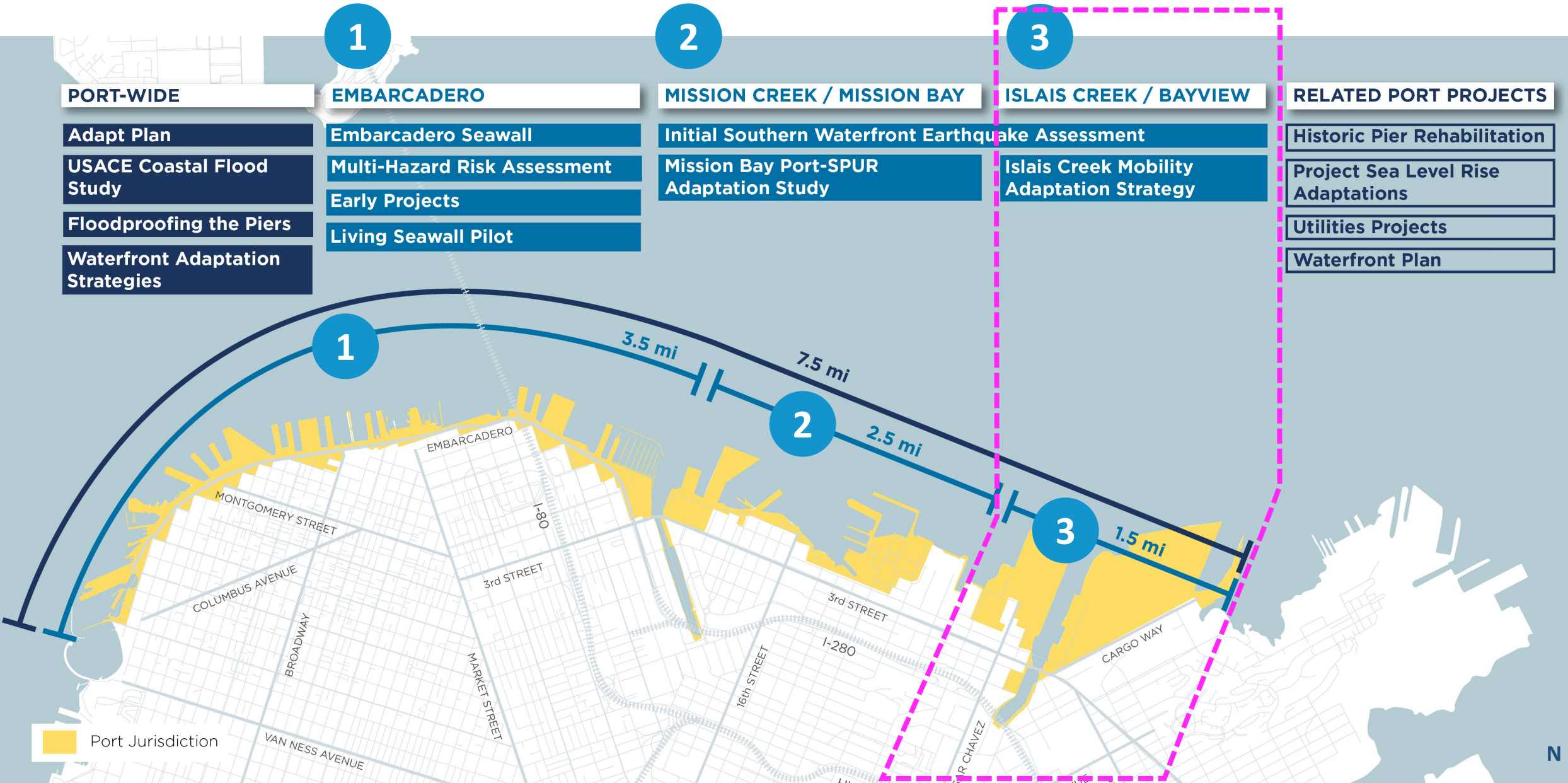
SEA LEVEL RISE VULNERABILITY & CONSEQUENCES ASSESSMENT

GENERAL PLAN SAFETY & RESILIENCE ELEMENT UPDATE

OCEAN BEACH ADAPTATION

FUTURE BAYVIEW RESILIENCE STRATEGY

WATERFRONT RESILIENCE PROGRAM & CITY EFFORTS: ISLAIS CREEK DISTRICT



ICSMAS **PROJECT PROCESS & TIMELINE**

2019–Sept 2020

- **Existing Conditions Analysis**
- **Combined Flood Model**
- **Key Assets Selection**
- **Engagement**
  - ✓ 3 In-Person Workshops
  - ✓ I Am Islais Campaign
  - ✓ Community Vision & Goals
  - ✓ Walking Tour
  - ✓ Y-Plan Youth Engagement
  - ✓ CBO Meetings
- **Adaptation (Exploratory) Scenarios**

Oct 2020–May 2021

- **Adaptation Strategies & Pathways**
  - Asset Scale
  - District Scale
- **Engagement**
  - ✓ CBO Meetings
  - ✓ Stakeholder Circle-Back Event
  - ✓ Commission & Board Hearings
- Economic Analysis
- Implementation & Financing Strategy

June 2021

- Planning Commission
- **Final Deliverables**
  - Conclude reviews
  - Incorporate comments
  - Final report to Caltrans

ONGOING Multi-Agency Coordination & Integration

1. PROJECT CONTEXT
2. **FRAMING & APPROACH**
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Photo courtesy of the Port of San Francisco

I AM ISLAIS

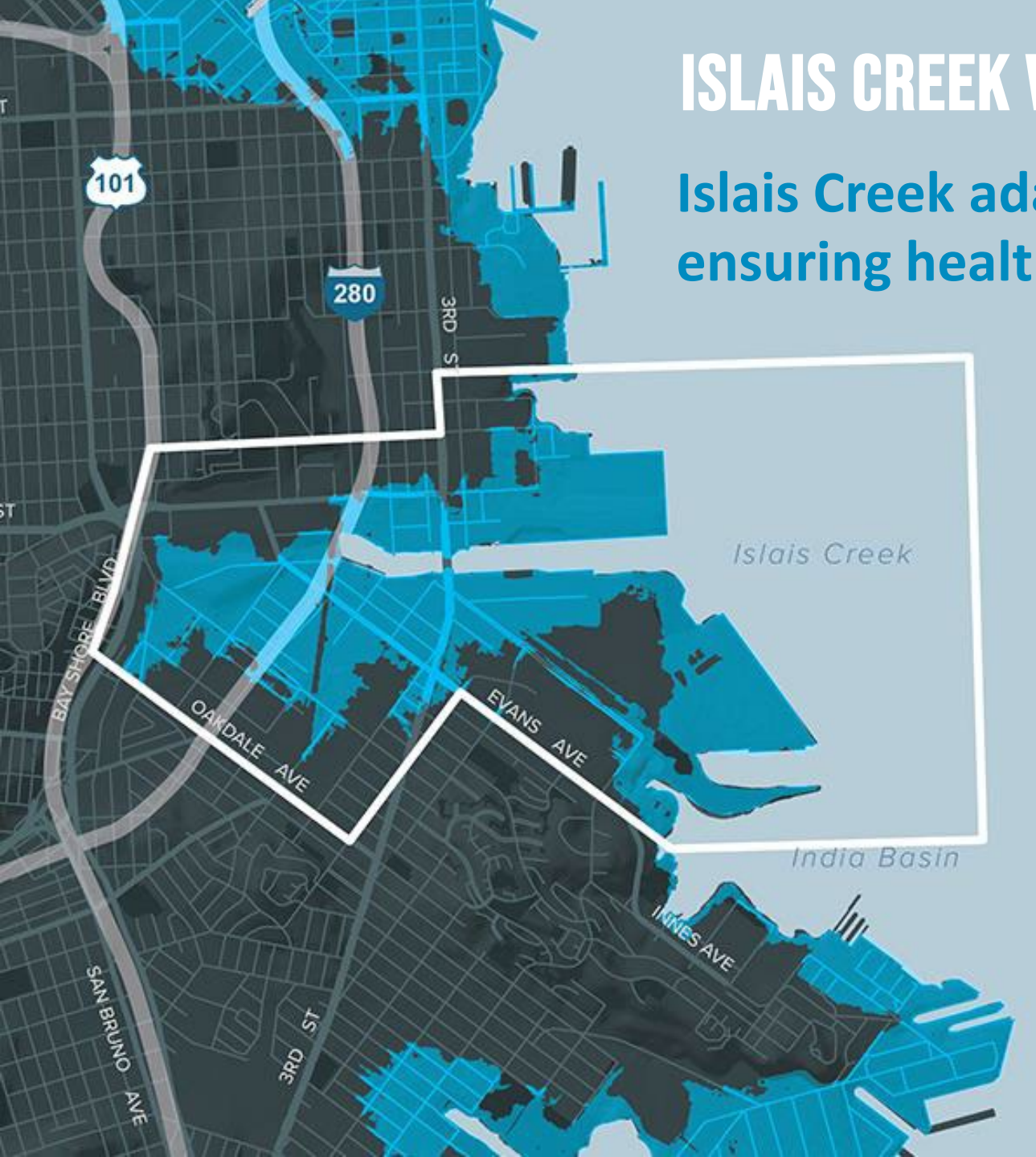
"The climate is changing and I want to protect my cousin. She lives down the hill and the flood can get to her. We have to stay together as a community to be prepared for floods."

ISLAIS CREEK ADAPTATION STRATEGY

Tek Li, with son
Youth Dragonboat Coach, Bayview Resident and SFUSD Educator

ISLAIS CREEK VISION & GOALS

Islais Creek adapts to flood risks while ensuring healthy and resilient communities.



1. **A socially and environmentally resilient neighborhood**
2. Authentic and transparent public engagement during and beyond planning
3. A **transportation** system that is resilient and adaptable to flood risk
4. A healthy **environment** for residents, workers, and ecologies
5. A sustainable **economy** that benefits local residents, workers, and industries

FLOOD ADAPTATION (PROTECTION) TOOLKIT: HARD / NATURE BASED / EARTHERN / EVENT-BASED

SEAWALL

A hardened vertical structure, that is anchored into and above the ground on both sides.

BEACH CREATION

Supporting or creating a beach through strategic placements of fine or coarse sand – can attenuate waves in front of other structures.

LEVEE

Engineered structure made of packed earth with an impermeable core.

RAISED EDGE

Adding a hardened lip or wall to an existing shoreline structure.

NATURE BASED / HYBRID SHORELINE

A variety of solutions that support flood protection and wave attenuation properties of natural shorelines.

AUTOMATIC BARRIERS

Installed mechanical devices that can be raised during storm events.

RAISED PIER

Raising a pier, either from underneath by increasing the height of the support structures, or by adding to the height of the pier surface itself.

FLOODABLE PARKS

Shoreline recreation and open spaces that are designed to accommodate water during storm events without resulting in permanent damage.

DEPLOYABLE BARRIERS

Flood barriers that can be temporarily installed during storm events.

REVETMENT

Armoring placed on the slope of embankments or berms as a defense against erosion - revetments can be constructed from large rocks, tetrapods, etc.

LIVING EDGE

A gently sloping earthen structure, possible backed by a levee, providing and ecotone slope for marsh vegetation and attenuating wave action.

STORMWATER MANAGEMENT

Diffuse inland green infrastructure strategies that absorb stormwater to prevent ponding and reduce peak flows during flood events.

WAVE ATTENUATION EDGE

Structural armoring built on the slope of embankments, such as interlocking concrete tiles or steps.

OFFSHORE SOLUTIONS

Structures that are placed in the water offshore to attenuate wave action – may be hardened structures or green/living structures.

LAND USE CHANGE

Strategies that allow the shoreline edge to migrate inland, with associated land use changes behind.

RAISE INFRASTRUCTURE

Elevating bridges, roads, or other infrastructure to be above flood waters. Raised infrastructure can also contribute to the protection of inland assets.

BERM

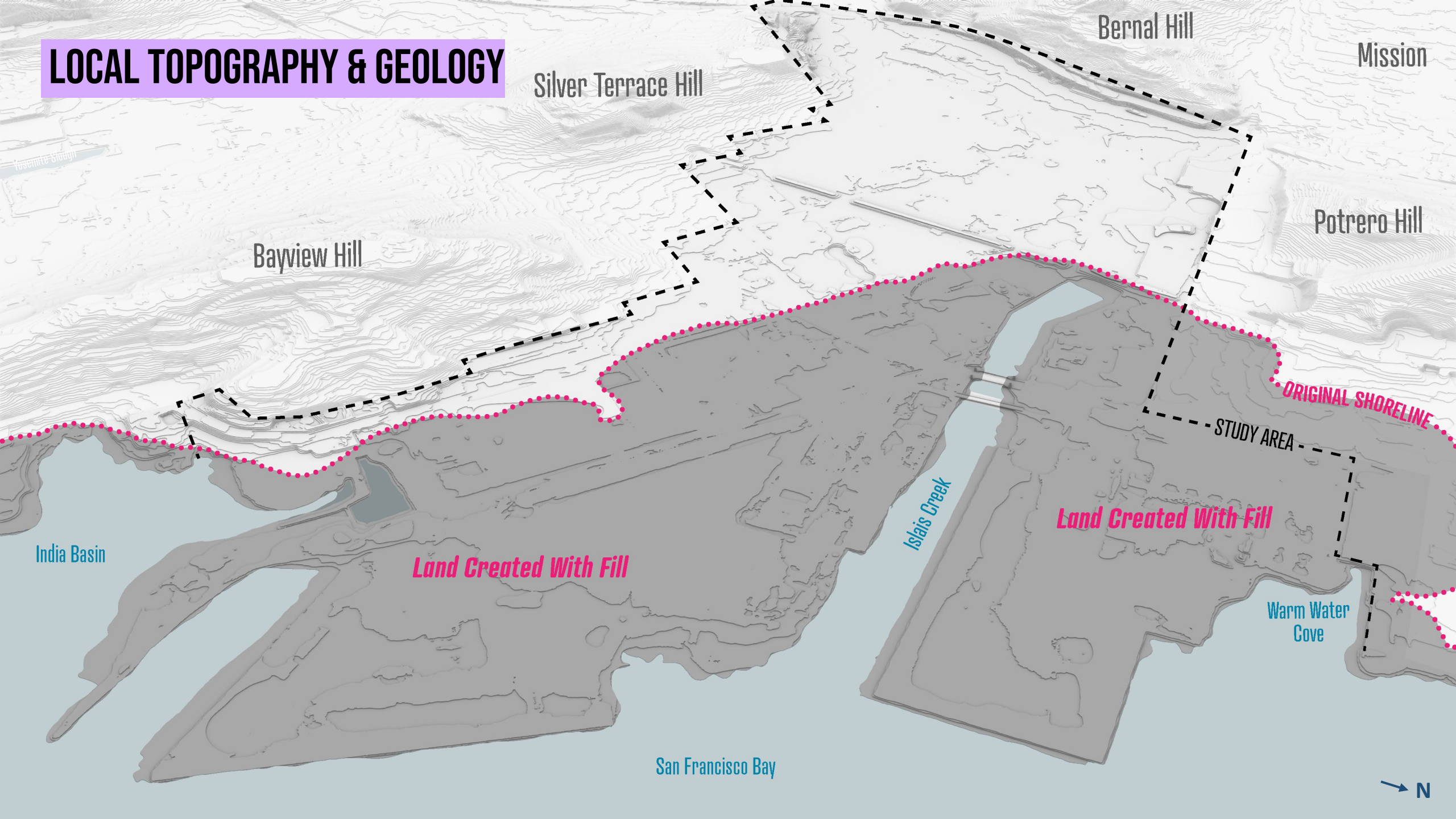
Earthen non-engineered mounds, potentially vegetated.

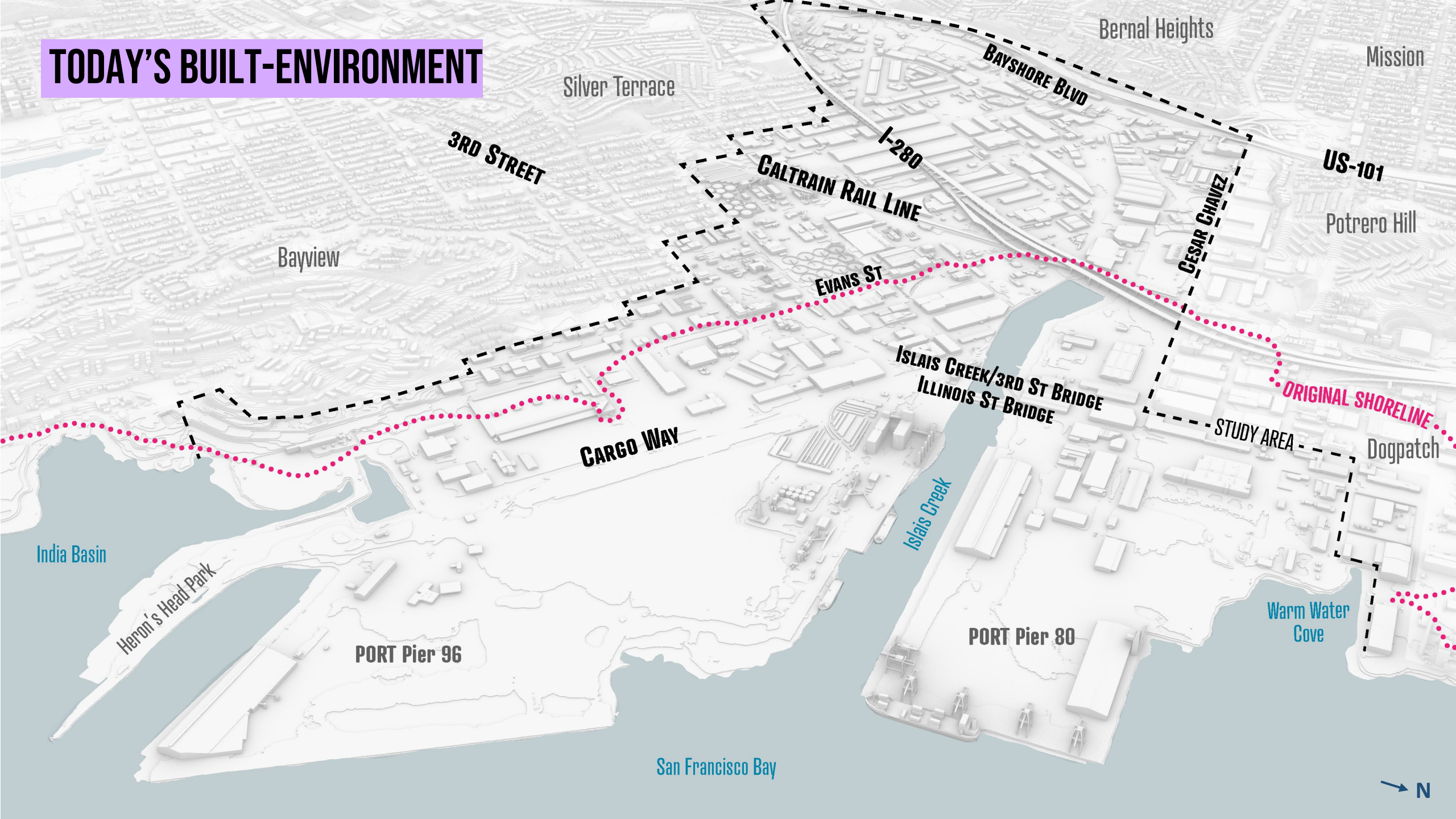
RAISE STRUCTURE

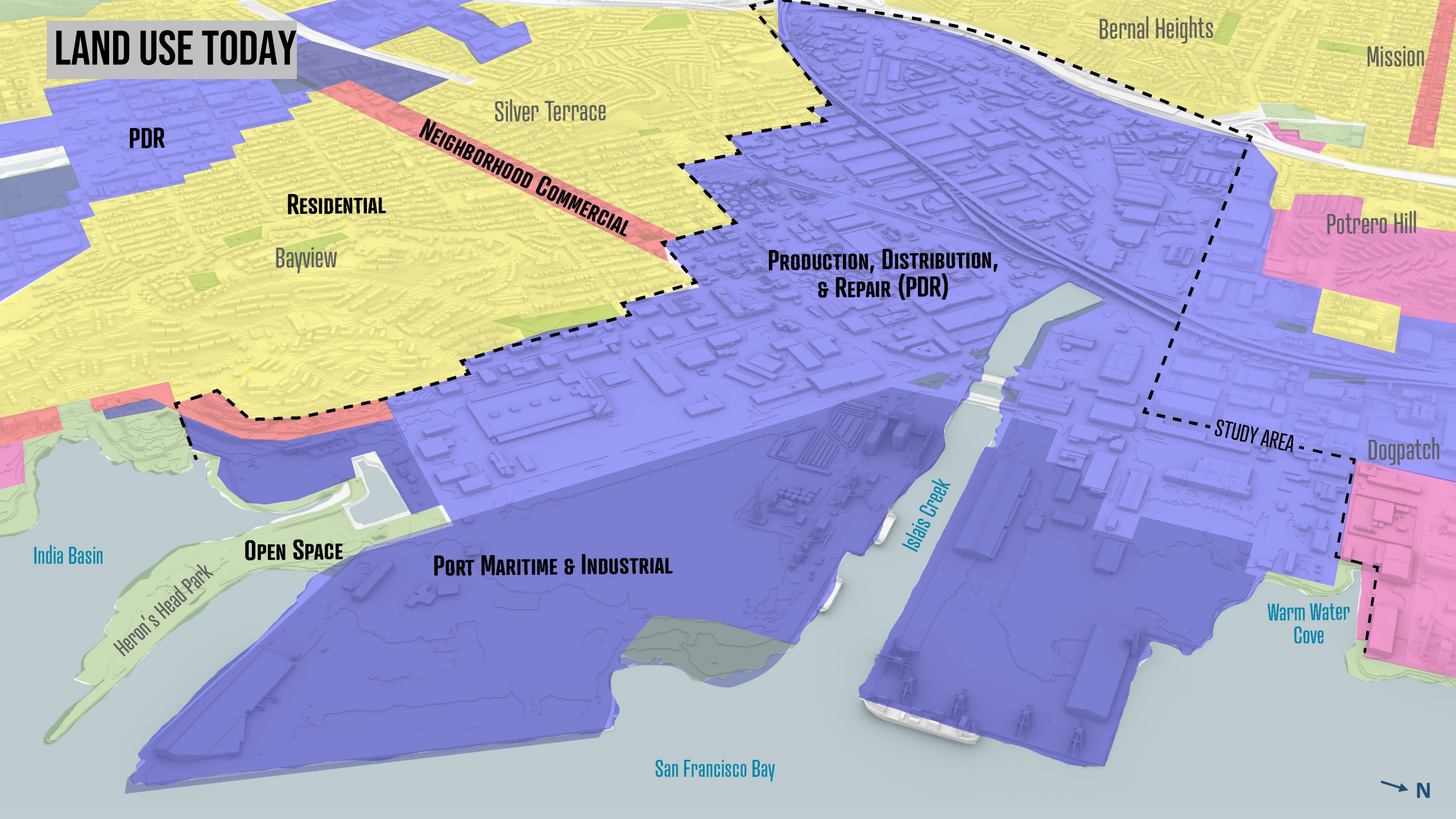
Elevating individual structures inland to be above flood waters, with measures like pile supports or elevated foundations.

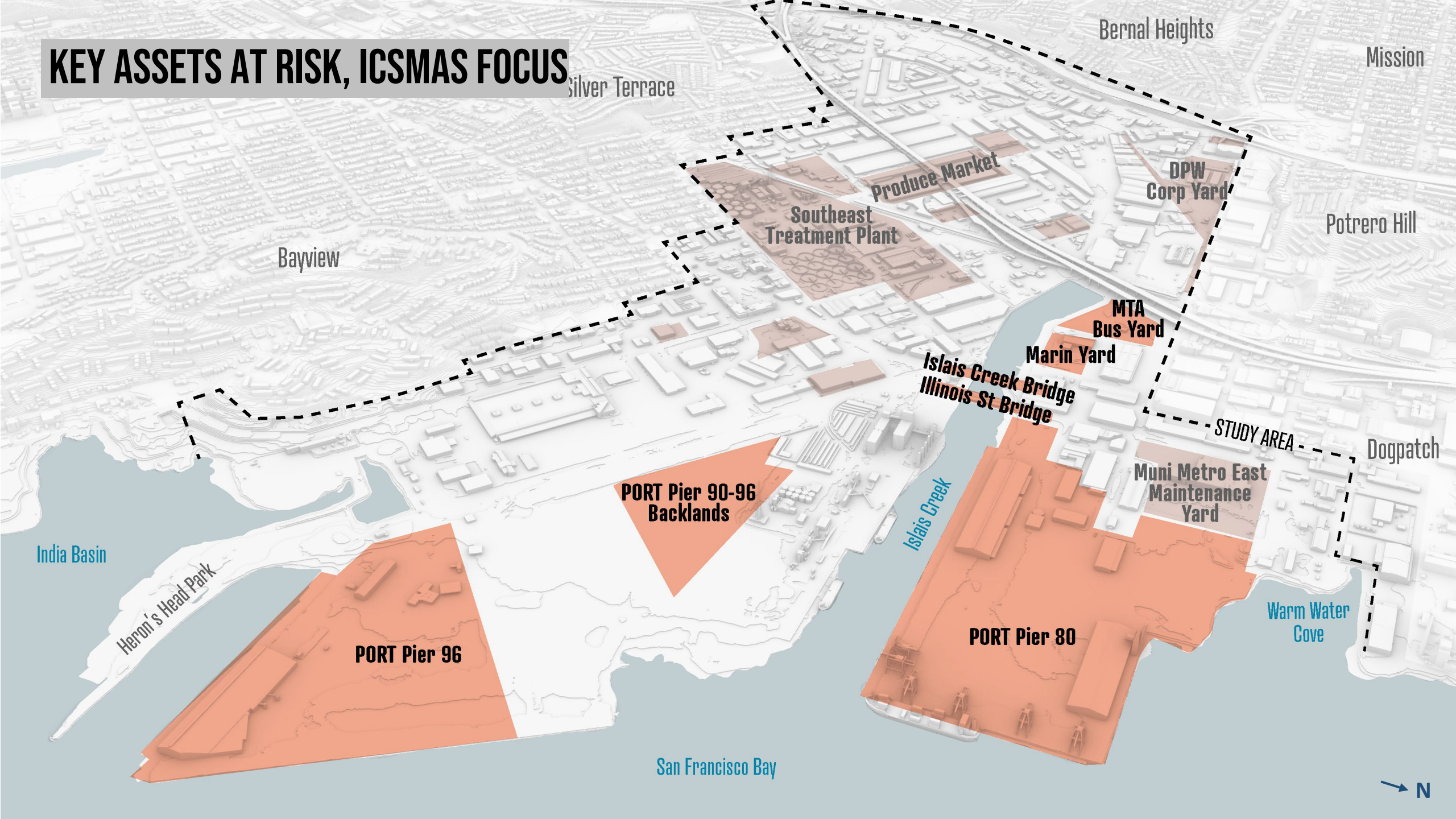
1. PROJECT CONTEXT
2. FRAMING & APPROACH
3. **OVERVIEW OF STRATEGIES**
4. DELIVERABLES & NEXT STEPS

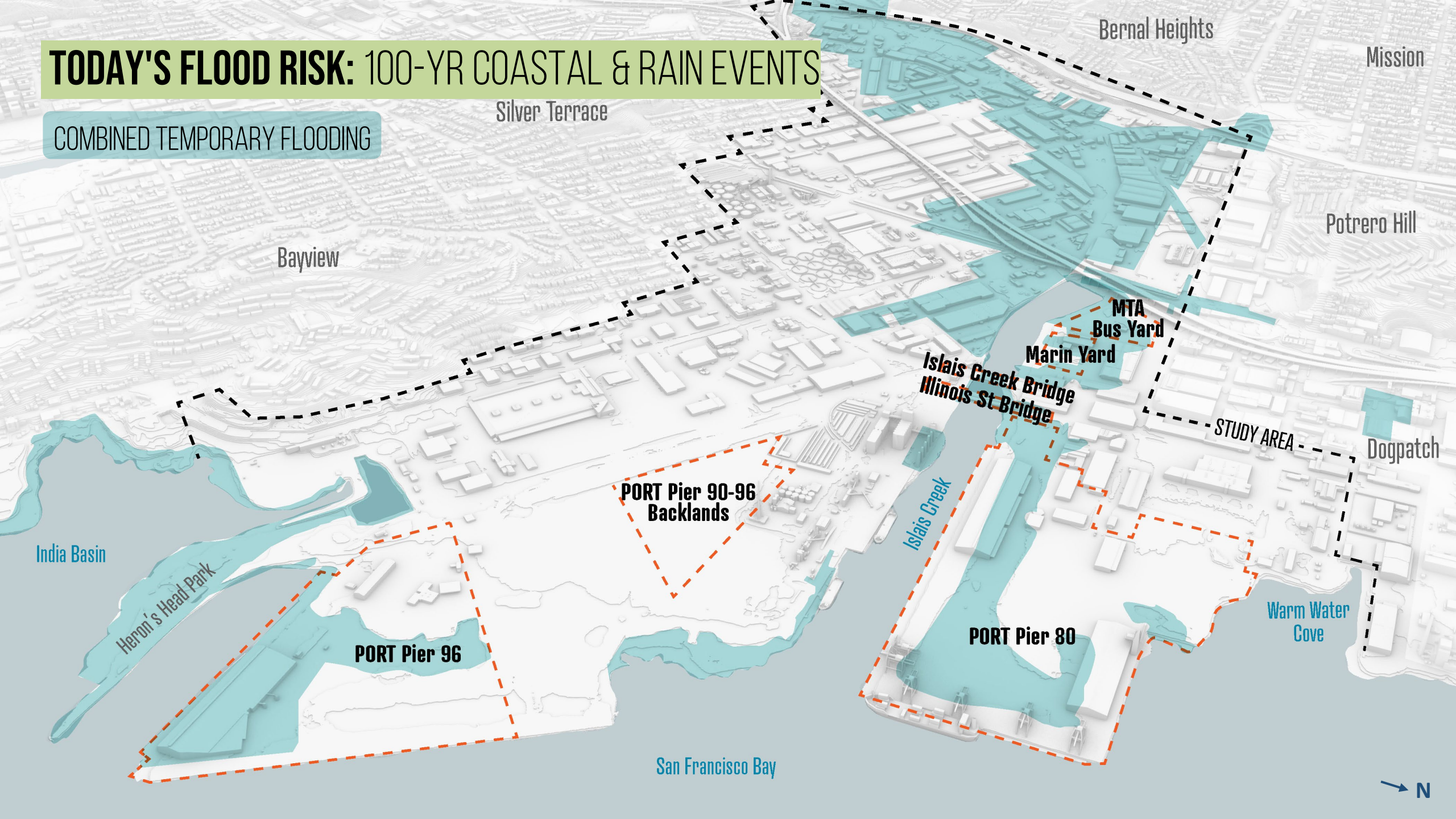
Photo courtesy of the Port of San Francisco

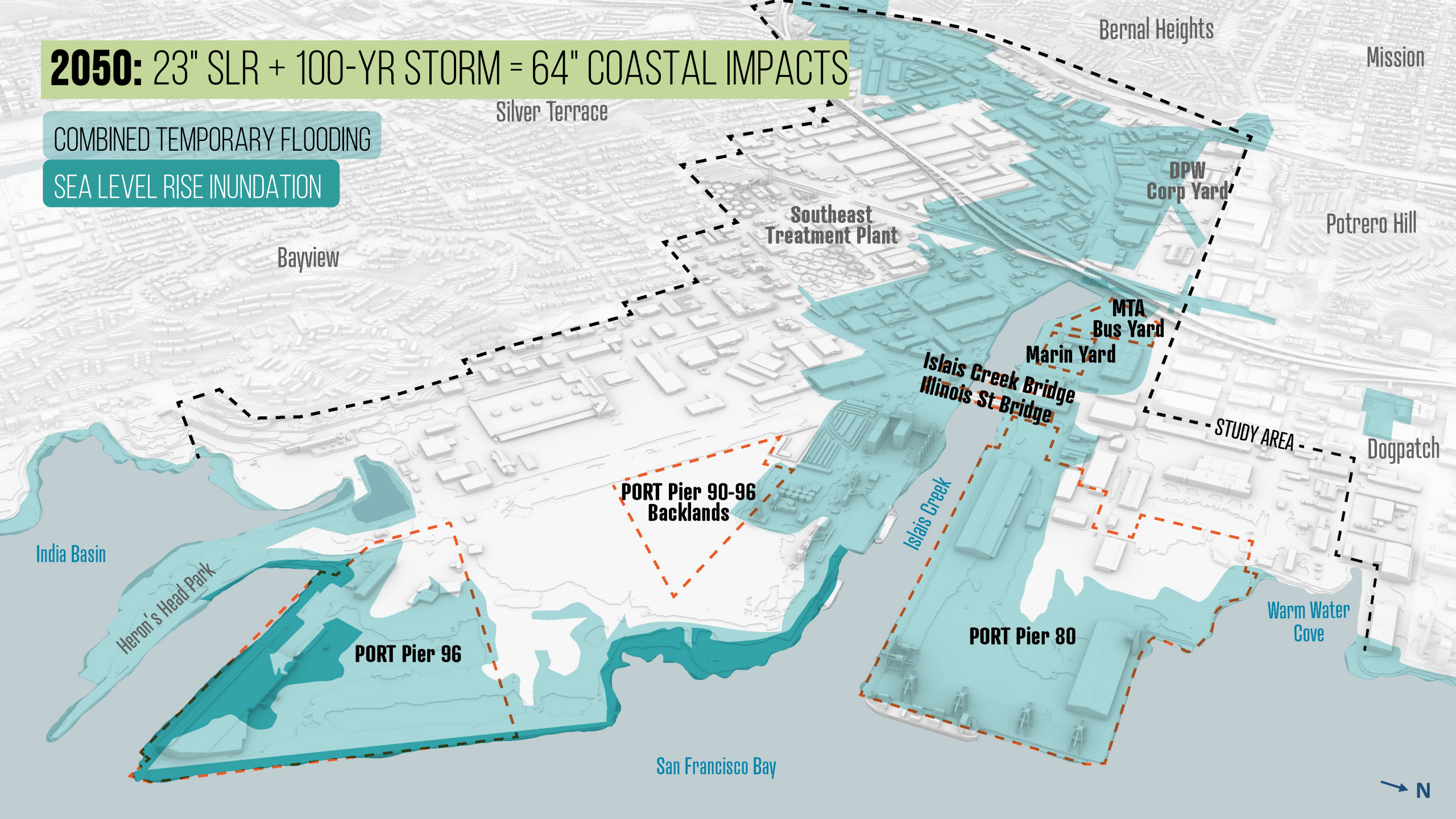

LOCAL TOPOGRAPHY & GEOLOGY
Silver Terrace Hill
Bernal Hill
Mission
Potrero Hill
Bayview Hill
ORIGINAL SHORELINE
STUDY AREA
Islais Creek
Land Created With Fill
Land Created With Fill
India Basin
Warm Water Cove
San Francisco Bay
N

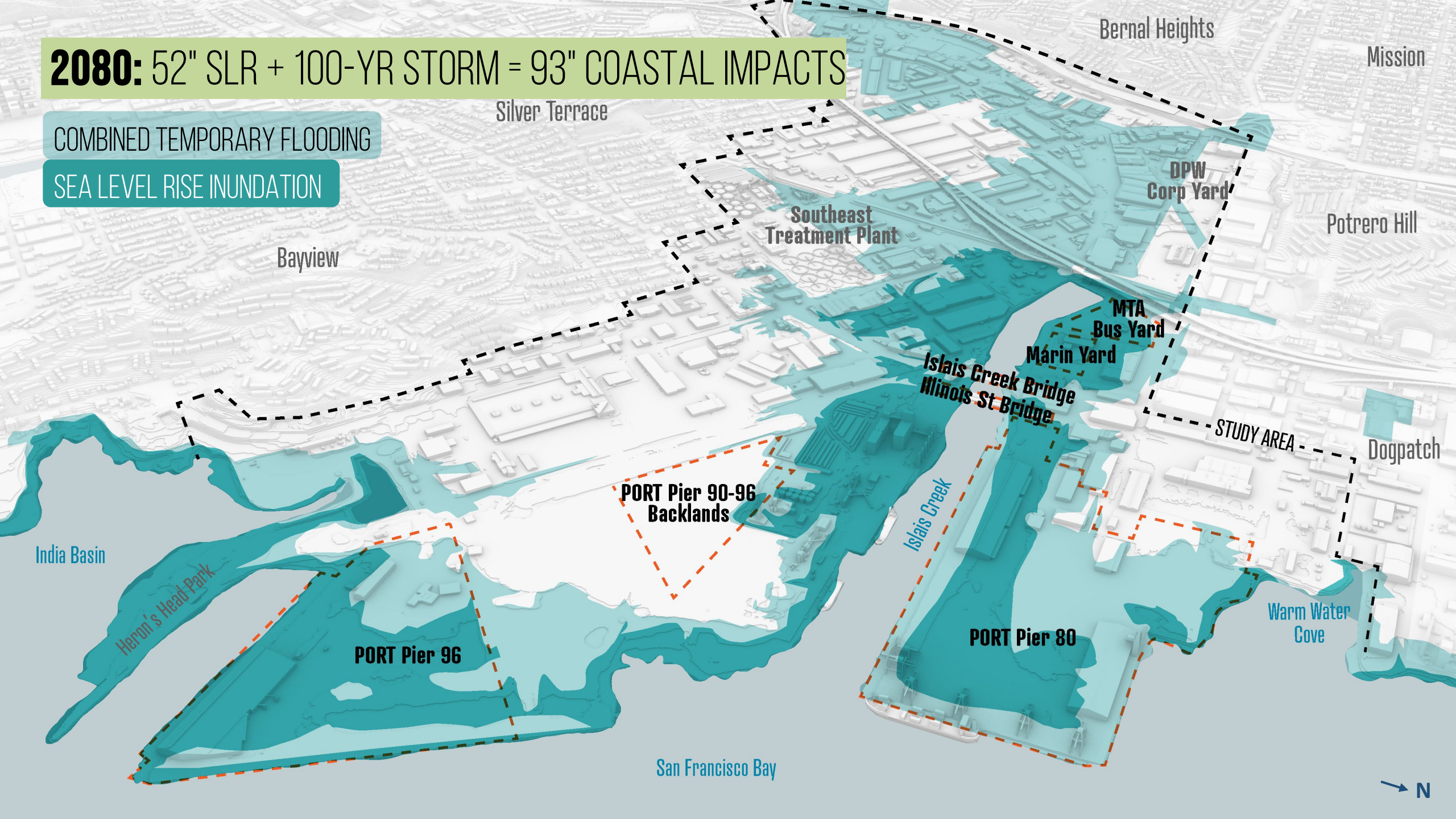

TODAY'S BUILT-ENVIRONMENT
Bernal Heights
Mission
Silver Terrace
BAYSHORE BLVD
3RD STREET
I-280
CALTRAIN RAIL LINE
US-101
CESAR CHAVEZ
Potrero Hill
Bayview
EVANS ST
ISLAIS CREEK/3RD ST BRIDGE
ILLINOIS ST BRIDGE
ORIGINAL SHORELINE
STUDY AREA
CARGO WAY
Dogpatch
Islais Creek
India Basin
Heron's Head Park
PORT Pier 96
PORT Pier 80
Warm Water Cove
San Francisco Bay
N

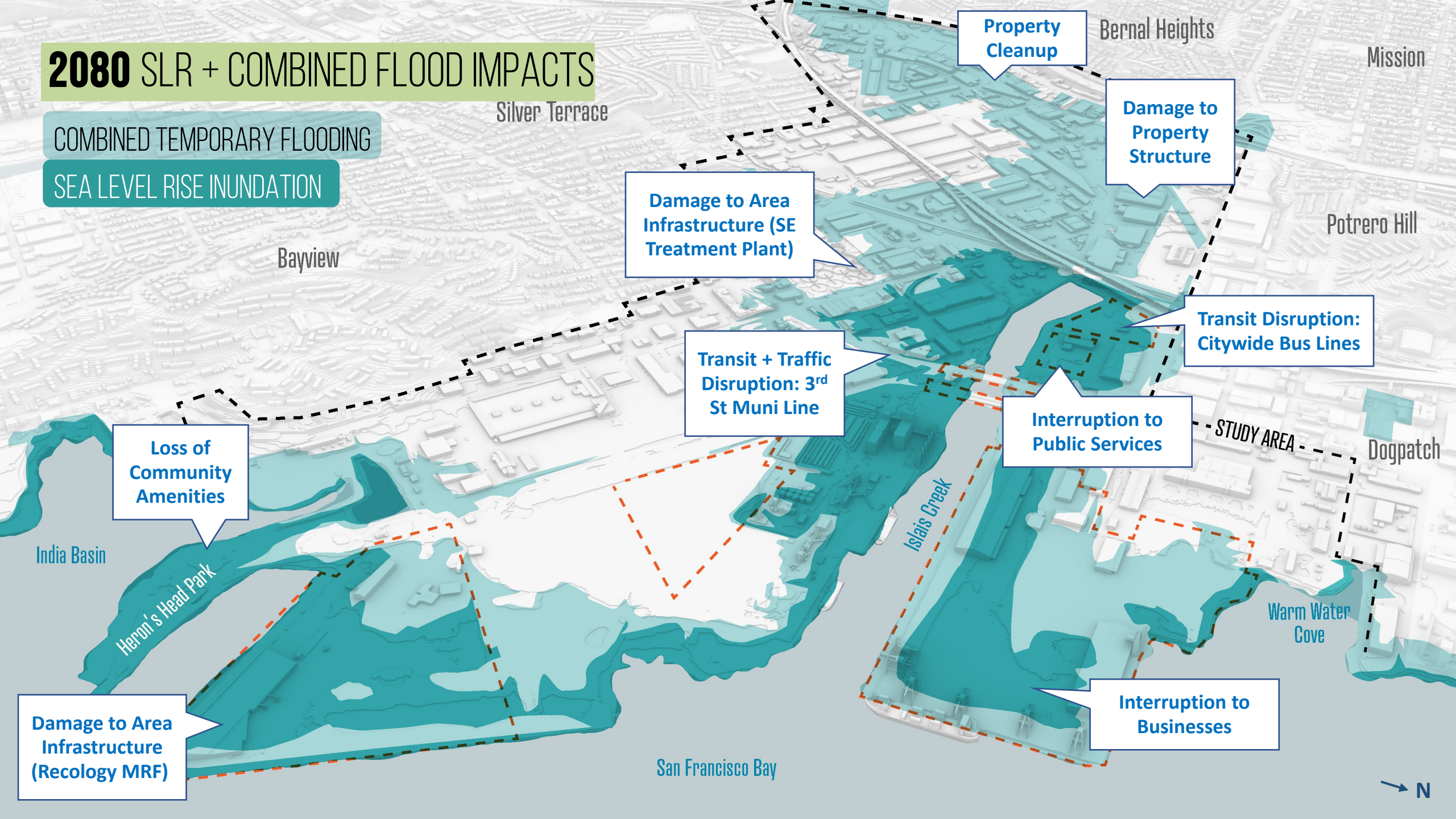

LAND USE TODAY
Bernal Heights
Mission
Silver Terrace
PDR
NEIGHBORHOOD COMMERCIAL
RESIDENTIAL
Bayview
PRODUCTION, DISTRIBUTION, & REPAIR (PDR)
Potrero Hill
STUDY AREA
Dogpatch
India Basin
OPEN SPACE
Heron's Head Park
PORT MARITIME & INDUSTRIAL
Islais Creek
Warm Water Cove
San Francisco Bay
N

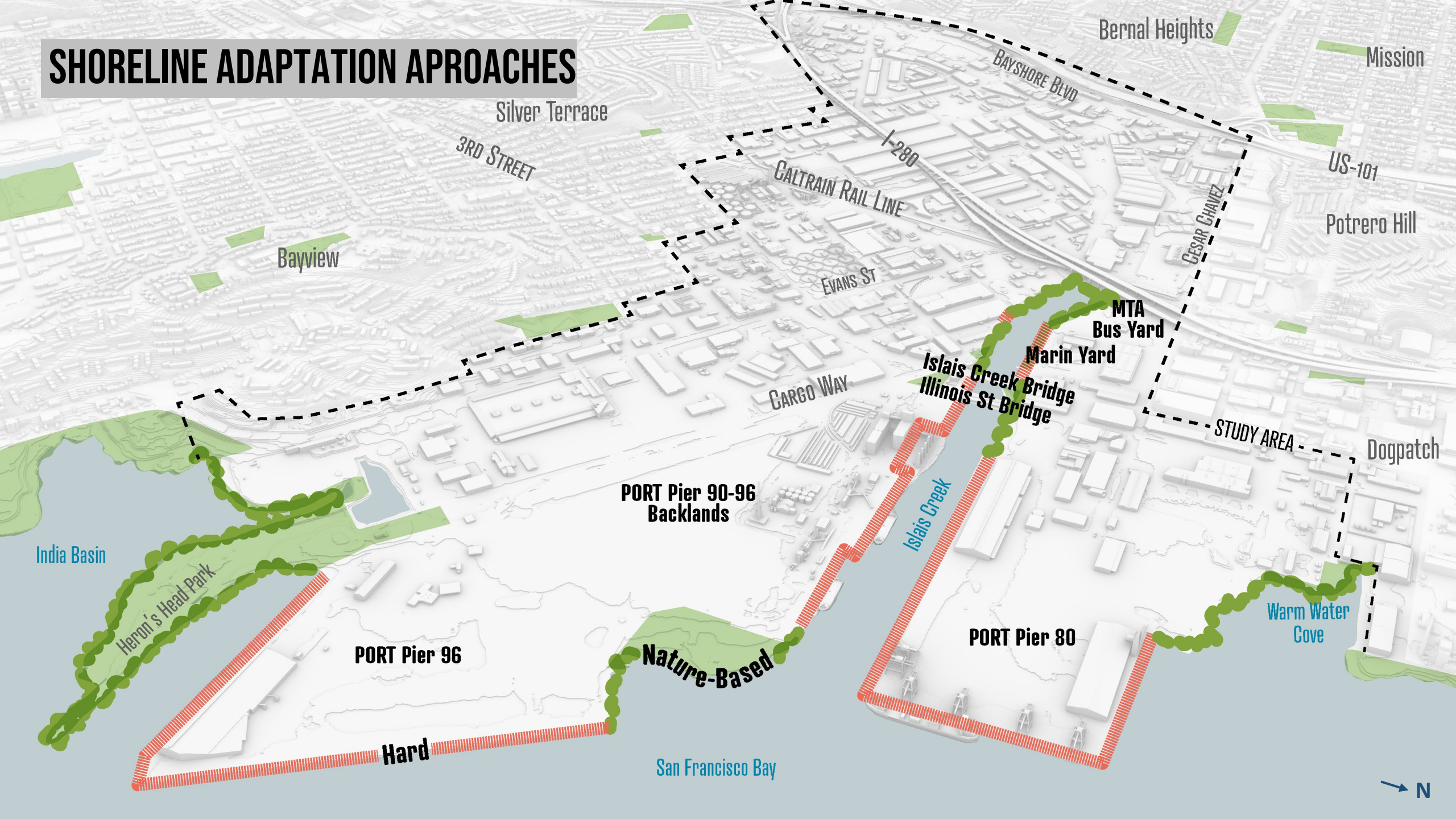

KEY ASSETS AT RISK, ICSMAS FOCUS
Bernal Heights
Mission
Silver Terrace
Produce Market
DPW
Corp Yard
Southeast
Treatment Plant
Potrero Hill
Bayview
MTA
Bus Yard
Marin Yard
Islais Creek Bridge
Illinois St Bridge
STUDY AREA
Dogpatch
Muni Metro East
Maintenance
Yard
PORT Pier 90-96
Backlands
Islais Creek
India Basin
Heron's Head Park
PORT Pier 96
PORT Pier 80
Warm Water
Cove
San Francisco Bay
N


TODAY'S FLOOD RISK: 100-YR COASTAL & RAIN EVENTS
COMBINED TEMPORARY FLOODING
Bernal Heights
Mission
Silver Terrace
Potrero Hill
Bayview
MTA
Bus Yard
Marin Yard
Islais Creek Bridge
Illinois St Bridge
STUDY AREA
Dogpatch
PORT Pier 90-96
Backlands
Islais Creek
India Basin
Heron's Head Park
PORT Pier 96
PORT Pier 80
Warm Water
Cove
San Francisco Bay
N


2050: 23" SLR + 100-YR STORM = 64" COASTAL IMPACTS
COMBINED TEMPORARY FLOODING
SEA LEVEL RISE INUNDATION
Bernal Heights
Mission
Silver Terrace
DPW
Corp Yard
Southeast
Treatment Plant
Potrero Hill
Bayview
MTA
Bus Yard
Marin Yard
Islais Creek Bridge
Illinois St Bridge
STUDY AREA
Dogpatch
PORT Pier 90-96
Backlands
Islais Creek
India Basin
Heron's Head Park
PORT Pier 96
PORT Pier 80
Warm Water
Cove
San Francisco Bay
N


2080: 52" SLR + 100-YR STORM = 93" COASTAL IMPACTS
COMBINED TEMPORARY FLOODING
SEA LEVEL RISE INUNDATION
Bernal Heights
Mission
Silver Terrace
DPW Corp Yard
Southeast Treatment Plant
Potrero Hill
Bayview
MTA Bus Yard
Marin Yard
Islais Creek Bridge
Illinois St Bridge
STUDY AREA
Dogpatch
PORT Pier 90-96 Backlands
Islais Creek
India Basin
Heron's Head Park
PORT Pier 96
PORT Pier 80
Warm Water Cove
San Francisco Bay
N


2080 SLR + COMBINED FLOOD IMPACTS
COMBINED TEMPORARY FLOODING
SEA LEVEL RISE INUNDATION
Property Cleanup
Bernal Heights
Mission
Silver Terrace
Damage to Property Structure
Damage to Area Infrastructure (SE Treatment Plant)
Potrero Hill
Bayview
Transit Disruption: Citywide Bus Lines
Transit + Traffic Disruption: 3rd St Muni Line
Interruption to Public Services
STUDY AREA
Dogpatch
Loss of Community Amenities
India Basin
Islais Creek
Heron's Head Park
Warm Water Cove
Interruption to Businesses
Damage to Area Infrastructure (Recology MRF)
San Francisco Bay
N


SHORELINE ADAPTATION APROACHES
Bernal Heights
Mission
Bayshore Blvd
Silver Terrace
3rd Street
I-280
Caltrain Rail Line
US-101
Potrero Hill
Cesar Chavez
Bayview
Evans St
MTA
Bus Yard
Marin Yard
Islais Creek Bridge
Illinois St Bridge
Cargo Way
STUDY AREA
Dogpatch
PORT Pier 90-96
Backlands
Islais Creek
India Basin
Heron's Head Park
PORT Pier 96
Nature-Based
PORT Pier 80
Warm Water
Cove
Hard
San Francisco Bay
N

KEY STRATEGIES & COMMUNITY GOALS

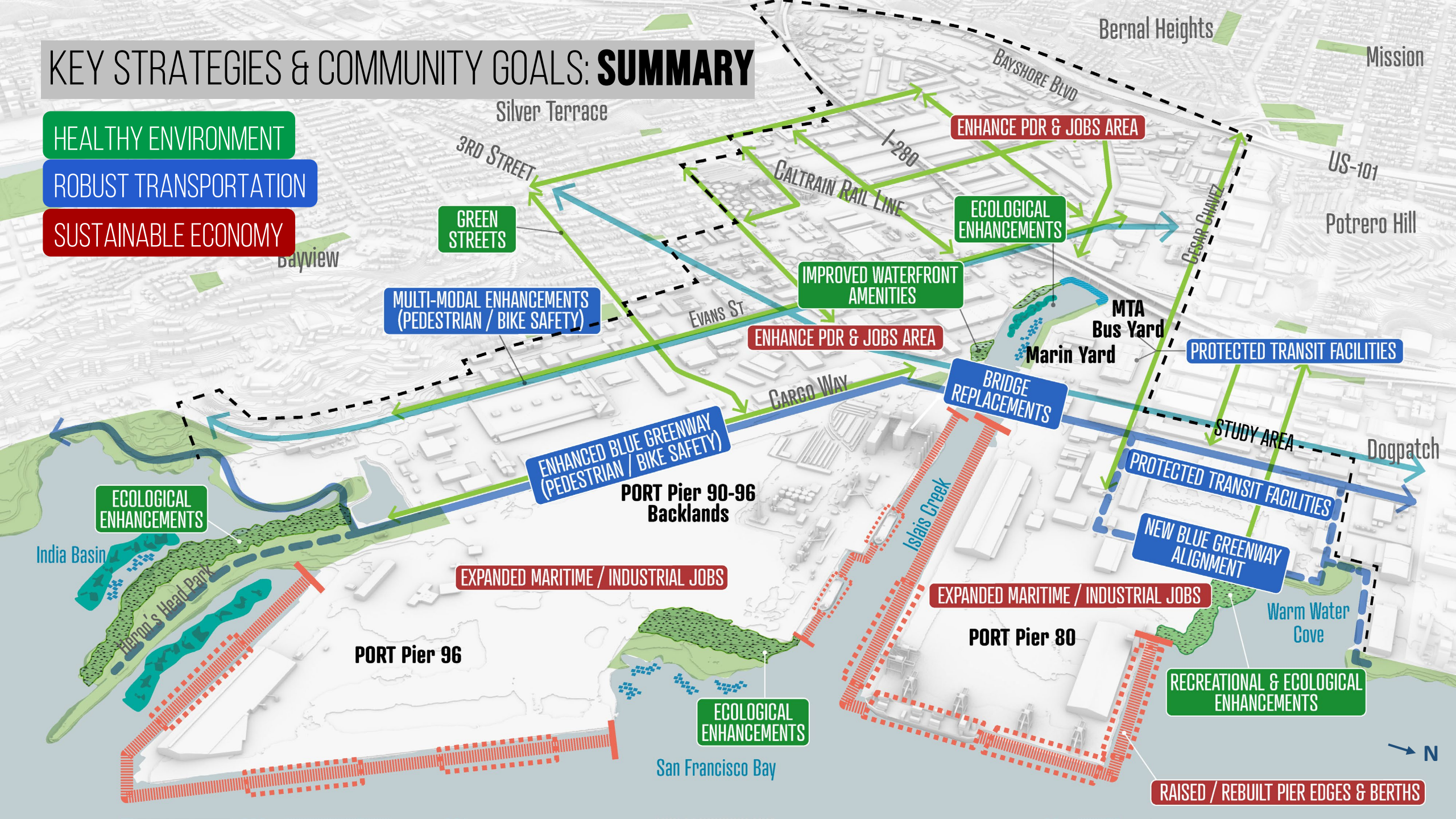
ROBUST TRANSPORTATION

KEY STRATEGIES & COMMUNITY GOALS

SUSTAINABLE ECONOMY

KEY STRATEGIES & COMMUNITY GOALS

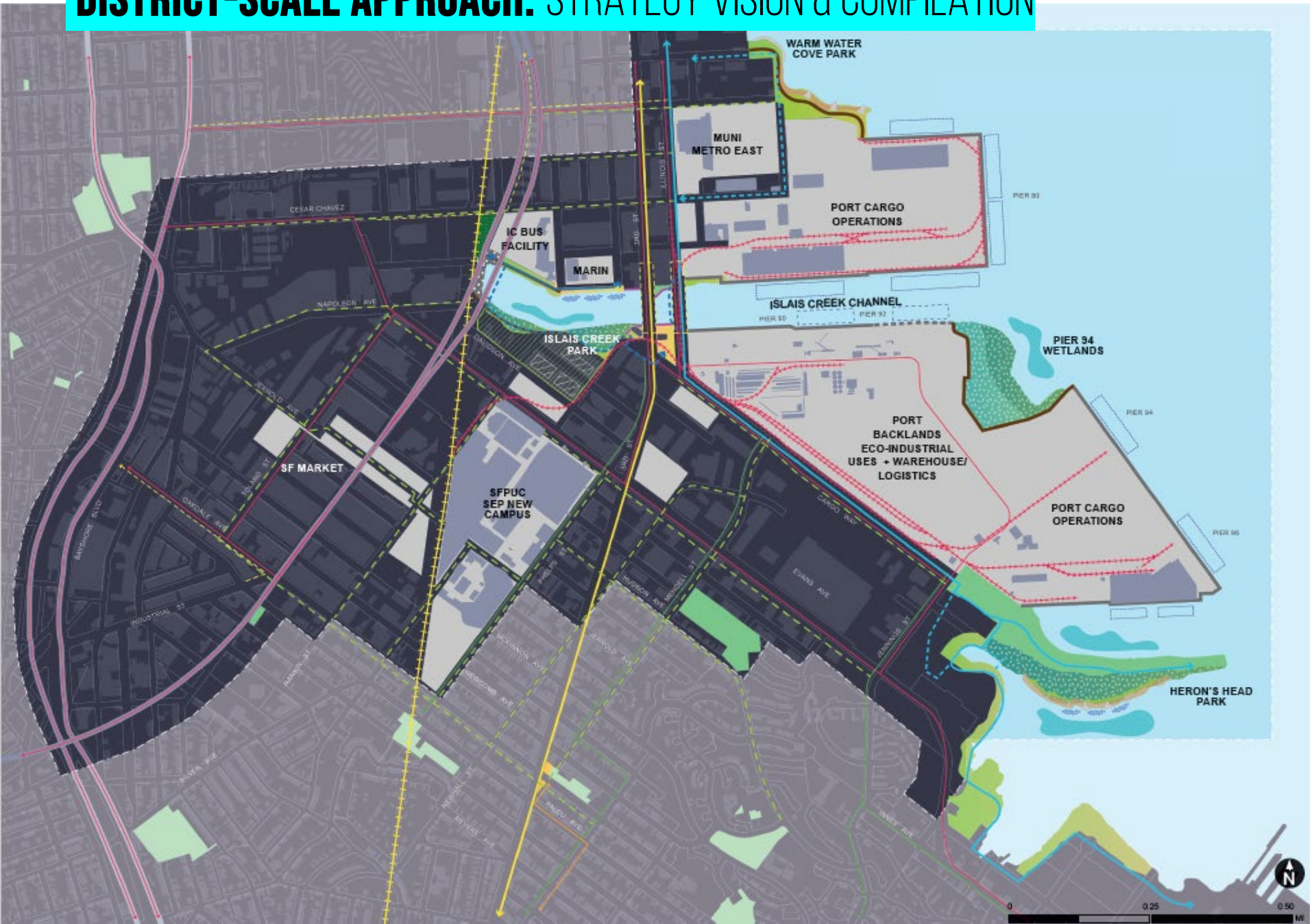
HEALTHY ENVIRONMENT


KEY STRATEGIES & COMMUNITY GOALS: SUMMARY
HEALTHY ENVIRONMENT
ROBUST TRANSPORTATION
SUSTAINABLE ECONOMY
Bernal Heights
Mission
Bayshore Blvd
Silver Terrace
3rd Street
I-280
Caltrain Rail Line
US-101
Potrero Hill
Cesar Chavez
Bayview
GREEN STREETS
ENHANCE PDR & JOBS AREA
ECOLOGICAL ENHANCEMENTS
IMPROVED WATERFRONT AMENITIES
MULTI-MODAL ENHANCEMENTS (PEDESTRIAN / BIKE SAFETY)
Evans St
ENHANCE PDR & JOBS AREA
MTA Bus Yard
Marin Yard
PROTECTED TRANSIT FACILITIES
Cargo Way
BRIDGE REPLACEMENTS
STUDY AREA
Dogpatch
ENHANCED BLUE GREENWAY (PEDESTRIAN / BIKE SAFETY)
PORT Pier 90-96 Backlands
PROTECTED TRANSIT FACILITIES
ECOLOGICAL ENHANCEMENTS
India Basin
Islais Creek
NEW BLUE GREENWAY ALIGNMENT
Heron's Head Park
EXPANDED MARITIME / INDUSTRIAL JOBS
EXPANDED MARITIME / INDUSTRIAL JOBS
Warm Water Cove
PORT Pier 96
PORT Pier 80
RECREATIONAL & ECOLOGICAL ENHANCEMENTS
ECOLOGICAL ENHANCEMENTS
San Francisco Bay
N
RAISED / REBUILT PIER EDGES & BERTHS

1. PROJECT CONTEXT
2. FRAMING & APPROACH
3. OVERVIEW OF STRATEGIES
4. **DELIVERABLES & NEXT STEPS**

Photo courtesy of the Port of San Francisco

DISTRICT-SCALE APPROACH: STRATEGY VISION & COMPILATION



Legend

NATURE-BASED FLOOD PROTECTION
- Existing Open Space
- New or Improved Open Space
- New or Improved Marsh Wetlands
- New Eel Grass Beds
- New Oyster Reefs
- New Beach
- New Rock Groyne
- New Green Streets

HARD FLOOD PROTECTION
- Raised & Rebuilt Pier Edge
- New Pier Edge
- New Flood Wall
- New Berm
- Replaced Bridge
- Existing Promenade or Plaza

BLUE GREENWAY
- Primary
- Proposed Addition

CREEK TRAIL
- Existing
- Proposed

MUNI CORRIDOR
- Existing (T Third Street)

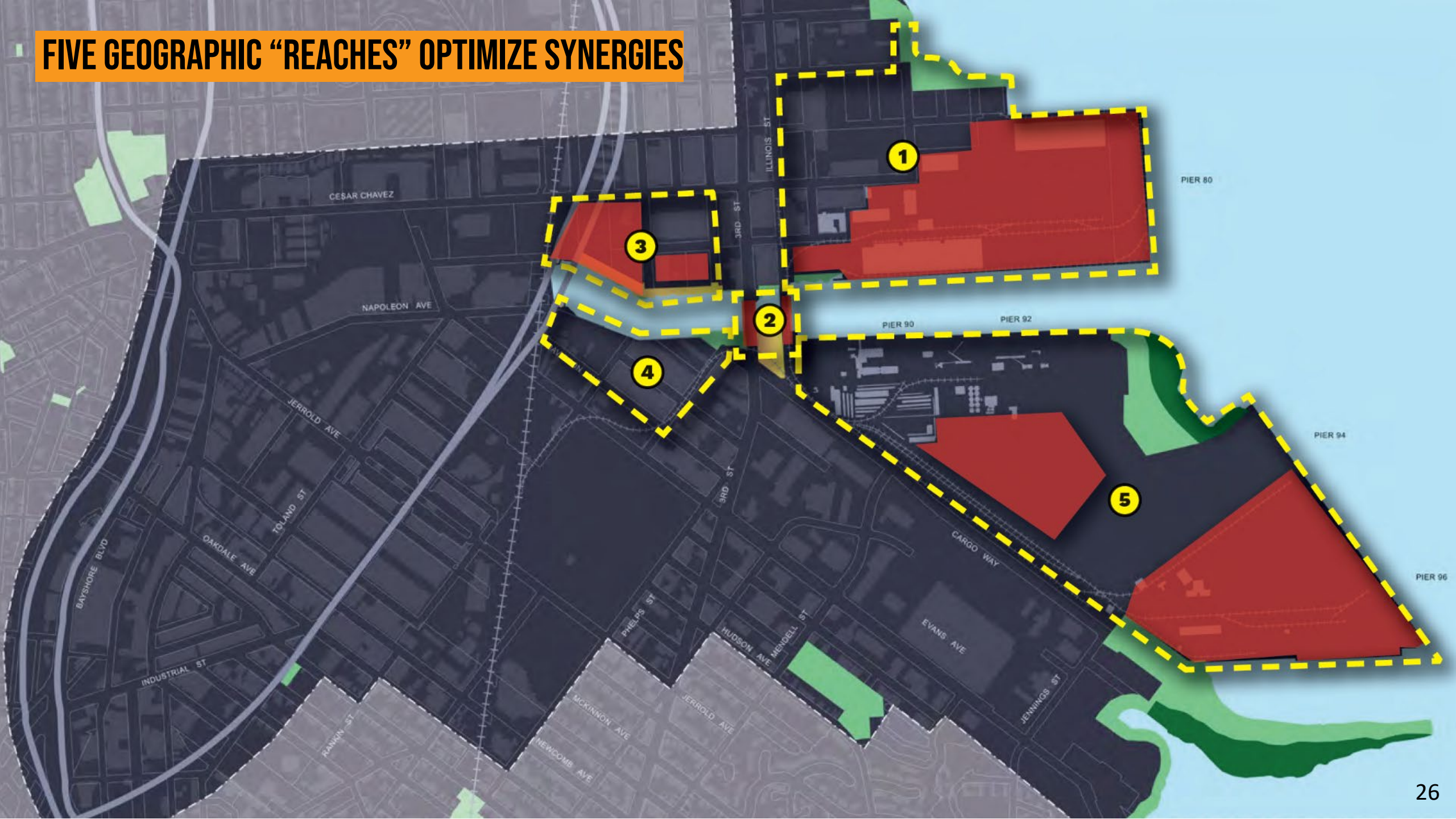
VEHICULAR
- Existing Truck Route

RAIL
- Existing Freight Rail
- Existing Caltrain Line

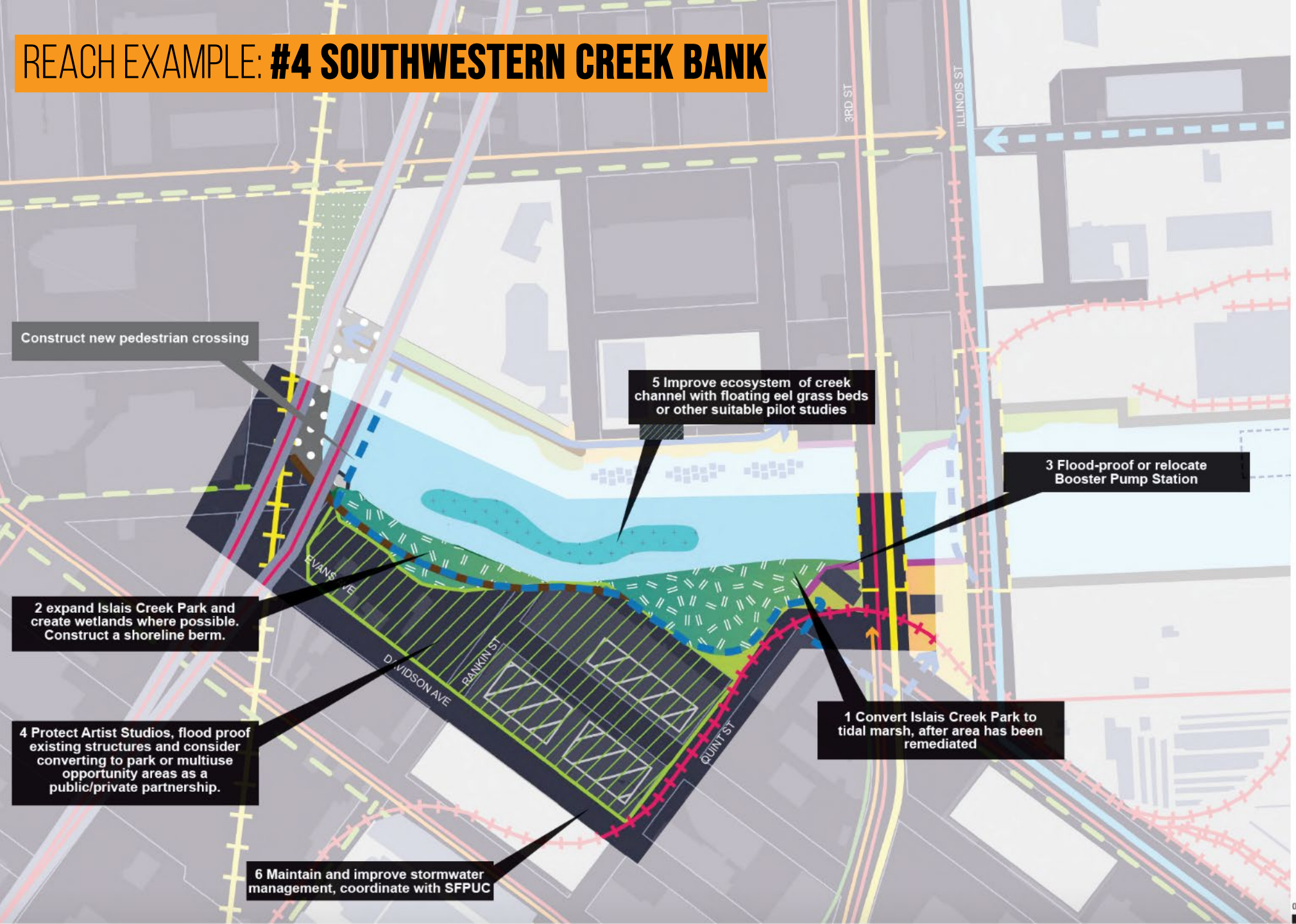
MARITIME
- Deep Water Berth
- General Water Berth

LAND USE
- Opportunity Area: Open Space & Mixed-Use
- City-owned Parcels (Consolidated & Optimized)
- Existing Buildings

FIVE GEOGRAPHIC "REACHES" OPTIMIZE SYNERGIES



REACH EXAMPLE: **#4 SOUTHWESTERN CREEK BANK**



NATURE-BASED FLOOD PROTECTION
- Existing Promenade or Plaza
- Existing Open Space
- New or Improved Open Space
- New or Improved Marsh Wetlands
- New Eel Grass Beds
- New Oyster Reefs
- New Beach
- New Rock Groyne
- New Green Streets

HARD FLOOD PROTECTION
- Raised & Rebuilt Pier Edge
- New Pier Edge
- New Flood Wall
- New Berm
- Replaced Bridge
- Existing Promenade or Plaza

BLUE GREENWAY
- Primary
- Proposed Addition

CREEK TRAIL
- Existing/ Primary
- Proposed Addition

MUNI CORRIDOR
- Existing
- Proposed Addition

BIKEWAYS
- Existing
- Proposed

VEHICULAR
- Existing Truck Route

RAIL
- Existing Freight Rail
- Existing Caltrain Line

MARITIME
- Deep Water Berth
- General Water Berth

LAND USE
- Opportunity Area: Open Space & Mixed-Use
- City-owned Parcels (Consolidated & Optimized)
- Existing Buildings

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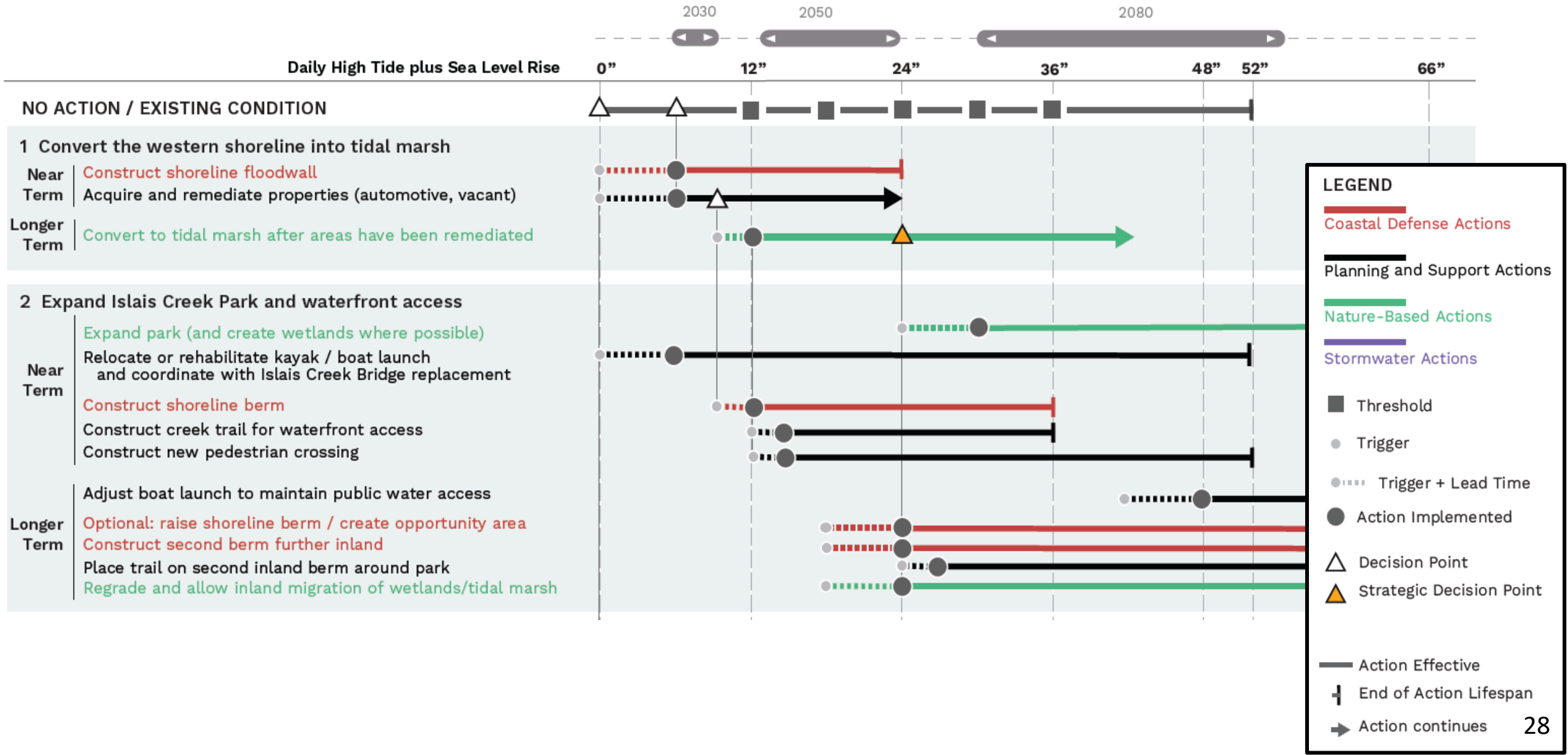
0 0.25 0.50 MI

ADAPTATION PATHWAYS DIAGRAM EXAMPLE: REACH 4



IMPLEMENTATION & FINANCING: **FUNDING, GRANTS, STRATEGIES BY REACHES AND DYNAMIC PROJECT LIST**

Funding & Financing Strategies for Near-Term Strategies

Revenue-generating & Financing Mechanisms

This table is intended to be dynamic and sortable using the drop down arrows in the column headers.

Category	Overseeing Jurisdiction	Type	Strategy	Eligible Projects	Applicability to ICSMAS Projects	Cost Burden Constituency	Key Benefits
Revenue-generating Mechanism	CCSF	Taxes & Fees	**New Sales Taxes**	Public infrastructure	All projects on City-owned property	Consumers	• Could bond against future revenues. • Can be used for capital or operating expenses.
Revenue-generating Mechanism	CCSF & State	Value Capture	**Tax Increment Financing, including Infrastructure and Enhanced Infrastructure Finance Districts (IFD/EIFD)**	Public infrastructure	All projects on City-owned property	Property owners within designated boundaries	• IFDs capture increases in property tax revenue stemming from growth in assessed value result of new development and uses that revenue to finance infrastructure projects. This relevant to the Islais Creek project. • Not subject to Proposition 13 limitations. • Process has been done elsewhere and is understood. • Geographic boundaries are flexible. • Most applicable for areas where there is significant development potential. • District could be designed for a long time horizon (45 year cap). • Could bond against future revenues (although fees may be higher due to risk of fluctuati
Revenue-generating Mechanism	CCSF	Value Capture	**Community Facility District (CFD)**	Public infrastructure	Projects that provide direct benefits to private property owners, such as stormwater and flood management	Property owners within designated boundaries	• Low approval thresholds needed where there is new development. • Boundaries do not need to be contiguous. • Flexibility in tax rate formula which can be dynamic across geographies (e.g. further from facility equates to lower rates). • Flexible use: revenue can be used for capital and some maintenance. • Process has been done elsewhere and is understood. • District could be designed for a long time horizon. • Rates can run in perpetuity and there is no renewal process. • Could bond against future revenues.

Funding & Financing Strategies for Near-Term Strategies

Grant Opportunities

This table is intended to be dynamic and sortable using the drop down arrows in the column headers.

Category	Type	Administering Organization	Program/Grant Name	Eligible Receiving Agencies	Recurring?	Description (for internal reference only)	Match Requirement	Funding Use (planning, implementation, both)	E
Flood Management	Federal	FEMA	**Building Resilient Infrastructures and Communities (BRIC) grant program (previously Pre-Disaster Mitigation Program)**	State or local public agencies	Yes	Building Resilient Infrastructure and Communities is a grant program that incentivizes public infrastructure projects, projects that mitigate risk to one or more lifelines, projects that incorporate nature-based solutions, and the adoption and enforcement of modern building codes.	Yes	Both	Public projec solutic of mo
Shoreline Protection	Federal	NOAA	**Coastal Resilience Grants Program**	State or local public agencies	Yes	Communities use Coastal Resilience Grants to develop inter-agency and inter-regional projects that save lives, protect property, reduce damage to infrastructure, and benefit ecosystems and the economy.	Yes	Planning	Coast infrast
Green Infrastructure & Nature-Based Solutions	Federal	NOAA	**Effects of Sea Level Rise (ESLR) Program**	State or local public agencies and non-profits and educational institutions	Yes	The Effects of Sea Level Rise (ESLR) Program seeks to improve adaptation and planning in response to regional and local effects of sea level rise and coastal inundation through targeted research on key technologies, natural and nature-based infrastructure, physical and biological processes, and model evaluation. The overall goal of the ESLR Program is to facilitate informed adaptation planning and coastal management decisions through a multidisciplinary research program that results in integrated models of dynamic physical and biological processes capable of evaluating	No	Planning	Coast surfac resilie
Flood Management	Federal	FEMA	**Flood Mitigation Assistance (FMA) Grant**	State or local public agencies	Yes	The Flood Mitigation Assistance Program is a competitive grant program that provides funding to states, local communities, federally recognized tribes and territories. Funds can be used for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program.	Yes	Planning	Reduc to buil

2050 Strategies: Implementation Details

DPW: San Francisco Department of Public
SFFD: San Francisco Fire Department
RWQCB: California State Water Resource

Reach	Strategy & Sub-Strategy	Near Term Strategies	Project Type	Hard Cost	Cost with Markup & Contingency	Potential Strategy Lead	Local Offices with Jurisdiction & Potential Implementation Partners	State and Federa Permitting and/o
R1	R1	**REACH 1: NORTHEASTERN WATERFRONT** **Key Asset: Pier 80** **Co-beneficiaries: Warm Water Cove Park and Muni Metro East**						
(R1) 1	(R1) 1	**1. Implement nature-based shoreline adaptation strategies to expand Warm Water Cove Park**						
R1	1.1	Temporary Flood Fighting Measures at Low Spots - Portable Cylinder Flood Barriers	Event	$178,436	$378,285	Port		USAC
R1	1.2.1	Construct pocket beach features	Nature	$1,452,150	$3,078,558	Port		USACE, U
R1	1.2.2	Add groynes	Nature	$628,267	$1,338,847	Port		USACE, U
R1	1.2.3	Re-nourish beaches	Nature	$1,452,150	$3,078,558	Port		USACE, U
R1	1.3	Add kayak launch at Warm Water Cove Park	Nature	$155,000	$330,308	Port		USACE, BCDC,

2050 Strategies: Implementation Details

This table is intended to be dynamic and sortable using the drop down arrows in the column headers.

Reach	Strategy & Sub-Strategy	Project Type	Near Term Strategies	Hard Cost	Cost with Markup & Contingency	Potential Strategy Lead
R1	1.1	Event	Temporary Flood Fighting Measures at Low Spots - Portable Cylinder Floc	$ 178,436	$ 378,285	Port
R1	1.2.1	Nature	Construct pocket beach features	$ 1,452,150	$ 3,078,558	Port
R1	1.2.2	Nature	Add groynes	$ 628,267	$ 1,338,847	Port
R1	1.2.3	Nature	Re-nourish beaches	$ 1,452,150	$ 3,078,558	Port

NEXT STEPS

- USACE Coastal Flood Study: ongoing coordination with the Waterfront Resilience Program
- Continue rich coordination with City agencies - funding strategies & project implementation
- Joint Benefits Authority investigations
- Combined flood model for area South of Heron’s Head park