Resilient Imperial Beach LCP Work Plan

Introduction

Imperial Beach's unique geography, surrounded on three sides by water and positioned as the most southwesterly city in the continental United States, is fundamental to its identity and key to understanding its challenges and opportunities. The City's most important natural attributes are its beaches and open spaces, which are highly valued by residents and visitors, and contribute to the City's economy.

Imperial Beach is a community comprised of rich contrasts; it is loved by residents for its small town, classic California character, and is located in the heart of the San Diego/Tijuana metropolitan region. It is known for its quaint, human-scaled waterfront, while also offering sweeping views of the Pacific Ocean, San Diego Bay and Mexico. Imperial Beach is home to beautiful sandy beaches and the internationally acclaimed Tijuana River Estuary wetlands, yet is fiscally challenged to provide the matching world class services needed to ensure that the public can continue to enjoy these priceless resources. Roughly half of the City is developed, and half is set aside for open space and military uses. Imperial Beach is a small city measured in acreage and population, yet has a reach beyond its size as it has taken a leadership role in regional open space preservation and in its stance that all levels of government and industry need to be accountable to protect environmental quality.

Imperial Beach functions as the south San Diego County beach destination, with estimates for beach attendance generally exceeding 440,000 visitors per year and generating $2.5 million in revenue per year (2016).[1] Additional visitors come to enjoy the rich wildlife and natural scenery of the Tijuana River Estuary and the San Diego Bay. Beach-goers and ecotourists frequenting local hotels, restaurants and other local businesses represent an important part of the City's current and planned tax and economic base. These same attributes also present the City with growing environmental and economic challenges due to binational water pollution and regional sea level rise impacts, as well as other factors.

Successfully adapting to the threat of sea level rise requires a strategic and comprehensive approach that is incrementally implemented. Shoreline protection that prioritizes the use of soft and/or living shoreline protection, such as beach nourishment, dune creation/enhancement, wetlands protection, and other similar strategies in conjunction with maintaining and/or optimizing existing protection devices is the preferred path forward. The employment of these strategies should be based upon quantifiable data indicating rising seas, actual events and their impacts, including severity and frequency, and an evaluation of the suitability of various strategies to protect the economy, environment, and community.

An important component in the long-term capacity of Imperial Beach to adapt to sea level rise is a regular reassessment of the amount and rate of change over time as well as physical impacts from flooding, storms, and tidal inundation. This will be influenced by future emissions levels and other global and regional factors. Utilizing the best available science is necessary to more fully understand future risks. In support of SLR monitoring and adaptation, the City is working with the UCSD Scripps Institution of Oceanography (SIO) assessing beach nourishment, sediment management, and SLR projections for the City and intends to continue this collaboration as well as identify additional opportunities in the future.

[1] Estimates were derived from data presented on pages C-5 – C-6 of the City of Imperial Beach Sea Level Rise Assessment, (Revell, 2016) and have not been updated.

Moving forward, the City is faced with challenges and opportunities to preserve and protect important local assets while addressing problems relating to environmental quality, aging infrastructure, sea level rise, and the rising costs of providing municipal services. The binational environmental pollution that Imperial Beach experiences also warrants attention as an environmental justice issue, as the City faces a high pollution burden and has a much higher lower-income population compared to San Diego County. In addition, all census tracts within Imperial Beach are identified as low resource areas using statewide maps scoring opportunities related to economic, environmental, and education categories.[2]

The 2022 Resilient Imperial Beach (RIB) project includes General Plan/LCP Update and Implementation Plan (IP) amendments designed to leverage the City's natural assets to achieve a more resilient and sustainable future. The RIB project also included development of a Climate Action Plan which was adopted in 2019. The General Plan component of the project includes a comprehensive policy update to the General Plan Land Use; Mobility; Conservation and Ecotourism; Parks, Recreation, and Coastal Access; Facilities and Services; Safety; and Design elements. One land use amendment was included: the re-designation of Salt Pond 10A from "Urban Reserve" to "Open Space." The Noise and Housing elements were not included in the update, but the Housing Element was updated separately in 2021.

Throughout the update process the City of Imperial Beach, as well as other jurisdictions in the region and state, have been developing systems-level solutions to address sea level rise adaptation strategies and climate mitigation measures that protect coastal resources; are responsive to the public input gathered through the update process; and are consistent with state General Plan law, the Coastal Act and other legislation. Sea level rise presents additional risks that Imperial Beach, like other coastal California cities, must plan for to reduce future damage, and more readily recover from impacts that may be unavoidable. It takes substantial fiscal resources to provide adequate everyday public health, safety and public access services and amenities to the City's residents and sizable visitor population. Significant additional resources are needed to address the supplemental expenses related to regional sea level rise impacts, binational pollution, and reducing greenhouse gas emissions from vehicle miles traveled. These issues of regional, state-wide and international significance require a systems approach to solutions and funding commitments from all levels of government and the private sector.

The 2022 update to the City's General Plan/Local Coastal Program (GP/LCP) establishes sea level rise resiliency policies and makes substantial progress to further implementation of Imperial Beach's Mission Statement "To maintain and enhance Imperial Beach as "Classic Southern California;" a beach-oriented community with a safe, small town, family atmosphere, rich in natural and cultural resources." It also focuses on working toward achieving the environmental and economic stability needed to build resiliency and retain the community character and quality of life valued by residents and visitors. However, the GP/LCP is a living document and there will be additional incremental work needed to more effectively implement the City's LCP over time.

It is currently envisioned that additional efforts will occur as a part of phased work programs as funding sources and staffing capacity are identified. Issues still in need of refinement and/or implementation are described in the following sections. The LCP update at-hand will serve as the foundation for the phased update process to SLR adaptation anticipated by the City. LCPs that are reevaluated and updated regularly are better able to respond to new information and dynamic sea level rise science and conditions as well as other important or emerging topics.

[2] Source: Imperial Beach 6th Cycle Housing Element, Section 2 - Community Profile, and Appendix D - Fair Housing Assessment

GP/LCP Work Plan Topics

A. Environmentally Sensitive Habitat Area (ESHA) and Biological Resources

Imperial Beach can be divided into two general areas: (1) the urbanized area, and (2) the undeveloped area. Little natural vegetation is present in the urbanized area. The existing vegetation consists of landscaping, mainly ornamental trees, some street trees, shrubbery and a variety of ground covers. Most of the landscaping can be found on private property. Landscaping on City streets, school grounds and playgrounds is conspicuously lacking which is most evident along major streets, in the commercial areas and in the beach area. In that the Tijuana River Estuary occupies most of the City's undeveloped land and is still in its natural state, the native vegetation that exists includes significant biological resources

Permanently protected open space and native habitats in the Tijuana River watershed are predominant land uses in the City. Along the City's southern border is the Tijuana River Valley which contains one of the largest intact coastal wetland systems in Southern California. The lower section of the Tijuana River Watershed encompasses 2,293 acres of the Tijuana River National Estuarine Research Reserve (TRNERR). The National Estuarine Research Reserve System (NERRS) is a network of protected areas established for long-term research, education, and stewardship. Through a partnership between the National Oceanic and Atmospheric Administration's Estuarine Reserves Division and the coastal states, the NERRS plays a critical role in sustaining the nation's estuaries and coastal communities. The TRNERR includes the Tijuana Slough National Wildlife Refuge (managed by the U.S. Fish and Wildlife Service) and Border Field State Park (managed by California State Parks). Approximately 928 acres of the TRNERR are located within Imperial Beach city limits.

In 2010, the TRNERR prepared an updated "Comprehensive Management Plan." The key goal of the Comprehensive Management Plan is "to protect, restore and enhance the viability of key coastal habitats and species and preserve the region's cultural heritage while encouraging compatible public use, education and research." In addition, planning is underway for the Tijuana Estuary Tidal Restoration Program- a large multi-phased wetland restoration program involving up to 500 acres of restoration. Its primary objective is to restore valuable habitat processes that have been lost, and to increase the exchange of water in a tidal cycle. This will enhance flushing, improve water quality, and enhance natural processes that deliver sediment from the watershed to the ocean (Revell, 2016). The City recognizes and supports the importance of the TRNERR for its ecological and open space values.

The Coastal Act requires protection of Environmentally Sensitive Habitat Areas (ESHA). Environmentally sensitive areas are defined in Section 30107.5 of the Coastal Act and commonly referred to as ESHA in practice. Three main elements must be met for an area or habitat to be considered ESHA:

1) A geographic area can be designated ESHA either because of the presence of individual species of rare plants or animals or because of the presence of a particular rare habitat,

2) An area is especially valuable due to its special nature or role in an ecosystem, and

3) An area that could be easily disturbed or degraded by human activities and developments.

2022 Update

The City's mapped Open Space Land Use Designation include "Area of Potential ESHA." These "Area of Potential ESHA" lands include biological resources that have not been formally mapped, quantified, or verified as "ESHA" by the City at this time. Natural areas within the City cannot be definitively identified as ESHA without further detailed and site-specific study. However, these formally designated open space areas are already federally- and

state-protected in perpetuity, thus, there is no risk that the existing habitat could be easily disturbed or degraded by human activities and/or developments as it is already fully protected on all sides and the existing surrounding roadways and development define the boundaries and serve to buffer the natural areas from further encroachment, disturbance or degradation.

Consistent with Coastal Act Section 30240, the GP/LCP includes policies intended to avoid any significant disruption of habitat values. The LCP further requires that development adjacent to an Area of Potential ESHA be sited and designed to prevent effects that would significantly degrade ESHA and to ensure continued compatibility with the natural areas. The General Plan/LCP also includes policies calling for the protection of areas adjacent to Area of Potential ESHA lands through the provision of buffers where there is the potential for a new impact on these areas. The City's determination of whether a setback/buffer is needed to avoid a direct adverse impact to natural habitats mapped within the Open Space areas, and/or the appropriate minimum setback/buffer width if warranted, should include analysis of environmental, economic and community impacts and must demonstrate a clear benefit to the natural habitat.

Table 1.A - ESHA and Biological Resources Work Plan

Item #	Topic/LCP Policy	Phased Implementation Work Plan	Status/Timing
1.	ESHA Policy 4.3.6	Formally map and quantify the ESHA through site-specific studies. Once mapped, design buffers to neighboring sensitive habitat areas to prevent effects that would significantly degrade ESHA and to ensure continued compatibility with the natural areas. This would include significant public outreach.	The City has applied for a National Coastal Resilience Fund (NCRF) Grant which would fund the effort to conduct surveys of the shoreline, bayfront, and estuary; and research, downloading and compiling existing data from the City, stakeholder agencies and other public sources. See Table 4 for additional details.
2.	Biological Resources 4.3.1 4.3.2 4.3.4 4.3.5 7.1.4	Convey a clear approach to addressing the biological impacts upon the bay and estuary shorelines as sea level rises, consistent with the Coastal Act call for resources to be "maintained, enhanced, and where feasible, restored" (Section 30230; marine resources) or "protected against any significant disruption of habitat values" (Section 30240; ESHA).	Continue to collaborate with TRNERR staff. The TRNERR Comprehensive Management Plan addresses the long term protection of biological resources.

B. Sea Level Rise (SLR) Assessments

The City of Imperial Beach is a low-lying coastal community in San Diego's South Bay area and is bounded by three existing bodies of water with the San Diego Bay and Otay River to the north, the Pacific Ocean to the west and the Tijuana Estuary to the South. With its unique location, the City currently experiences tidal inundation and flooding during king tide events that are anticipated to be exacerbated by sea level rise. The City of Imperial Beach is home to approximately 26,137 people with 18.9% of residents living below the poverty level (U.S. Census, 2019) and an

unemployment rate of 8.2% (SANDAG, Employment Analysis, 2021), both of which are above the national average. Additionally, 51.1% of the population are Hispanic or Latino persons (U.S. Census, 2019). As stated above, all census tracts in the city have been identified low resource areas based on statewide opportunity maps.

In 2016, the City of Imperial Beach completed a Sea Level Rise Vulnerability Assessment (SLRVA) which identified the impacts that the City currently experiences related to hazards such as storm waves and tidal flooding, coastal erosion, and high groundwater during high tides and storm events will be further exacerbated in the future due to sea level rise. According to the study, increased impacts are projected to start occurring in 2047 with a 1.6 foot increase in sea levels should the City, or others, not implement sea level rise adaptation strategies.

The SLRVA represented an initial step in the local adaptation planning process by providing the information the City needed to begin to identify and understand the local hazards and risks that rising seas will have locally. As a next step, the City developed policies that are included in the 2022 LCP Update to address existing hazards and plan for new development or redevelopment that protects not only existing structures but also coastal resources and public access consistent with the Coastal Act. The City also supports continued monitoring of local tide gauges which will provide quantified indicators of rising seas. Consistent monitoring of sea level rise and related impacts such as changes in sand volume, beach width and severity and frequency of damage to property and structures are necessary to evaluate the adequacy of existing and potential future adaptation strategies and the timing for implementation of additional adaptation strategies.

The City understands the limitations of the 2016 SLRVA, and has begun the process of informing the community of the need for additional studies and adaptation strategies. For example, NOAA released data in 2022 that contains updated SLR projections that are tied to each of their tide gauges. Notably, the H++ scenario is no longer referenced. In addition, California has begun preparing the 5th Climate Change Assessment and a full understanding of the interplay of GHG emissions and SLR levels is still being evaluated. Given the dynamic nature of climate science and related SLR projections, the City will continue to monitor all related developments. It is currently envisioned that additional studies would be conducted incrementally as grant funding is secured, as well as through shoreline hazard evaluations required as a part of coastal development plans. Such future studies will take into consideration the current alignment of existing structures, whether they are currently vulnerable or require protection and whether the standards typically applied to new development assuring anticipated safety for the life of the development can be feasibly met.

As of spring 2022, the California Coastal Commission (CCC) recognizes the State of California Sea-Level Rise (SLR) Guidance released in March 2018 by the Ocean Protection Council (OPC Guidance), as the “best available science” on sea level rise along the coast of California. The OPC Guidance uses a probabilistic approach to generate a range of sea level rise projections at a given time horizon. However, the rate of rise and the nature of SLR effects vary greatly along the coast. For example, the nearest local tide gauge In La Jolla at the Scripps Pier has shown a linear or consistent rate of SLR of 2.13 cm per year for the last 100 years. See: https://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?id=9410230.

The 2018 OPC Guidance also lays out a risk decision framework around which projections to use. The 2018 OPC Guidance provides projections for low, medium-high and critical risk aversion applications but these three categories alone may not reflect the entire range of probabilistic projections which continue to be highly dynamic both in magnitude and probability of occurrence.

The uncertainties in the model projections, combined with our growing understanding of the complex inter-relationships and feedback loops associated with global climate change, underscore the vital importance of closely monitoring local and regional sea levels, tracking local shoreline conditions, and developing a feasible and flexible plan of action to ensure that the City of Imperial Beach remains resilient to sea level rise. As a part of the City’s

phased Work Plan, the City will consult the best available state, regional and local data and decision frameworks available at the time that adaptation decisions are being made, to develop a coastal resiliency plan that ensures an appropriate local response to sea level rise.

2022 LCP/GP Update

The 2022 update (Sections 7.1 and 8.3) includes the following:

- Using best available science to conduct regular reassessment of the amount and rate of change over time as well as physical impacts from flooding, storms, and tidal inundation
- Commitment to update the City's Sea Level Rise Assessment every 10-15 years consistent with the best available and recognized climate change science as determined by the City
- Collaborate with regional partners to establish a comprehensive beach and shoreline management plan to support adaptation of beach and shoreline areas along the coast, the San Diego Bay, and the Tijuana Reserve Estuary
- Monitor beach profiles, shoreline conditions, and sea level rise impacts
- Incorporate resiliency for infrastructure/Capital Improvement Program projects
- Continue to pursue funding opportunities to promote the identification, planning, and implementation of adaptation measures that protect and promote the shoreline and/or coastal access.

Table 1.B - Sea Level Rise (SLR) Assessments Work Plan

Item #	Topic / LCP Policy	Phased Adaptation / Implementation Work Plan	Status/Timing
3.	SLR Assessments Policy 7.1.1	Update SLR Vulnerability Assessment consistent with the best available and recognized climate change science and/or measurable changes to SLR data at Scripps Pier Tide Gauge, the NOAA tide gauge in the San Diego Bay, and the data logger station at the Oneonta Slough (Estuary).	Approximately 10-15 years from LCP certification by the Coastal Commission.
4.	Hazards Assessments Policies 7.4.3 -7.4.5	Conduct hazard assessments for critical public infrastructure and facilities of concern including stormwater flood-prone areas. Assess: • Coastal flooding from a 100-year wave event • Coastal erosion • Tidal inundation • Nuisance stormwater flooding • Seismic vulnerability due to groundwater and soil saturation	To be prepared as a part of the next County of San Diego Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) update and incorporated by reference into the General Plan/LCP (anticipated to occur in 2023).

Item #	Topic / LCP Policy	Phased Adaptation / Implementation Work Plan	Status/Timing
5.	Monitoring Policies 7.1.3 -7.1.4)	Utilize existing SANDAG Regional Shoreline Monitoring Program transects established in 1999 using 20+ years of baseline data for purposes of monitoring shoreline changes caused by SLR. Utilize the data collection from the Tijuana National Estuarine Research Reserve to monitor the water levels within the Estuary. Utilize the data collection from the NOAA tide gauge located in the San Diego Bay to monitor the water levels within the San Diego Bay.	Refinements to the existing shoreline monitoring plan would be developed as a part of the Imperial Beach Community Resilience Plan proposed in the NCRF grant application. See Table 4.

C. Adaptation Measures to Promote Long-Term Coastal Resiliency

Adaptation to climate change involves a range of small and large adjustments to natural and/or human systems that occur in response to already experienced or anticipated climate change impacts. Adaptation planning involves a wide range of policy, programmatic, and project-level measures that can be implemented in advance of, or reactively to the potential impacts depending on the degree of preparedness and risk tolerance. Good adaptation planning should enhance community resilience to human-caused hazards and natural disasters.

Managing development to respond to coastal hazards is a key component of a local coastal program. Coastal Act policies direct new development to reduce risks to life and property and avoid substantial changes to natural landforms. Effective adaptation and reduction of risks will require maintaining and enhancing natural infrastructure, such as beaches, dune systems and wetlands, and improving the resiliency of manmade infrastructure. Implementation to address the near- and long-term hazard risks from sea level rise will require substantial funding and collaboration and a solid understanding of the City's specific risks, the timeframe of impacts, and the physical processes responsible for causing the risk, now and in the future.

2022 LCP Update

Safety Element Section 7.1 of the General Plan/LCP covers Sea Level Rise Monitoring, Planning, and Adaptation. Effective adaptation and reduction of risks will require maintaining and enhancing natural infrastructure, such as beaches and wetlands, and improving the resiliency of manmade infrastructure. Implementation to address the near- and long-term hazard risks from sea level rise will require substantial funding and collaboration. The element includes new discussion text on sea level rise assessment and adaptation strategies, stating that the timing of adaptation strategies will need to respond to regular reassessments. Rather than set a hard timeframe for adaptation strategies, it is important to base the need for action on quantifiable data obtained from local and regional monitoring. Consistent monitoring of sea level rise and related impacts such as changes in sand volume, beach width and severity and frequency of damage to property and structures are necessary to evaluate the adequacy of existing and potential future adaptation strategies and the timing for implementation of additional adaptation strategies.

The use of shoreline protection devices, beach nourishment, continued adaptation of public infrastructure, living shorelines and additional strategies are anticipated to be used throughout the lifetime of the 2022 General Plan/Local Coastal Program Update (i.e., planning horizon is 2020-2040) and beyond. The development of new adaptation measures and new strategies based on local need and regional systems will also need to be implemented.

The 2022 LCP IP Update also includes a *Sea Level Rise Area Adaptation Strategy Checklist* as a tool to help monitor sea level rise and determine case-by-case strategies to improve resiliency. This checklist is intended to provide a systematic means for evaluation of strategies and triggers to guide planning and implementation of resiliency measures. Recognizing that SLR may have different impacts on different areas of the City, this checklist provides a framework for the collection and evaluation of monitoring data that can be used to maintain up-to-date information on vulnerabilities for the Pacific coastline, estuary, bayfront, and interior. The evaluation steps outlined by the checklist will be performed on a periodic basis as deemed necessary by the City for each of the areas to gauge the necessity and feasibility of establishing various adaptation strategies. A range of alternatives and planning timeframes will be considered. Planning timeframes will vary by strategy and are shorter for such strategies as beach nourishment, while longer term strategies such as adapting existing infrastructure/property require more time to plan and secure funding. The Checklist includes monitoring, existing strategies, observed impacts, frequency, effectiveness, alternatives, funding opportunities, feasibility, and thresholds describing when new adaptation strategies are necessary.

The 2022 update includes additional policies as follows:

Shoreline Management (Section 7.1) and Disaster Preparedness (Section 7.4):

- Collaborate with regional partners to establish a comprehensive beach and shoreline management plan
- Continue to allow shoreline protective devices that do not result in feasibly avoidable negative community impacts and are necessary to protect structures from identified coastal hazards and to protect public beach accessways
- Encourage designs that reduce SLR risk
- Conduct monitoring to inform adaptation measures, as well as the beach and shoreline management plan
- Coordinate with other agencies to develop adaptation strategies
- State that managed retreat not viable or necessary or appropriate in the foreseeable future and the City does not intend to pursue it as IB is a fully urbanized and built out community and promoting managed retreat would result in a loss of housing and the State has a “no net loss” of housing law
- Continue to seek public input to inform strategies, response plans, evacuation routes, and prioritization of public improvements related to disaster preparedness and resiliency
- Coordinate across City and County departments and seek to align the Multi-Jurisdiction Hazard Mitigation Plan with the LCP

Water Quality Protection (Section 4.4):

- Expand discussion of impacts of beach closures/polluted water
- Link water quality to public health, visitor economy, and quality of life

- Continue to collaborate on bi-national solutions to control Tijuana River pollution and improve conditions, while pressing for infrastructure improvements on both sides of the border
- Further water conservation and prevention of water quality degradation
- Protect ecosystems

Climate Change (Section 4.1):

- Provides climate policies for sustainable development, greenhouse gas emissions, urban heat island, urban forest, water supply, climate change adaptation, sea level rise resiliency, wildfire risk, hazard mitigation
- Provides policy support for a Climate Action Plan which was prepared and adopted
- Cites findings of the climate vulnerability assessment (CVA) prepared as a part of California's Fourth Climate Change Assessment - San Diego Region Report, which identifies climate change impacts related to sea level rise (SLR), increasingly warmer average temperatures, more frequent and likely more intense heat waves, more intense droughts, occasionally increased heavy rainfall events and floods, continuing Santa Ana winds and wildfire threats among others.

Table 1.C - SLR Adaptation & Coastal Resiliency Work Plan

Item #	Topic/LCP Policy	Phased Implementation Work Plan	Status/Timing
6.	Water Quality/Critical Water Infrastructure Section 4.4 Policies Policy 7.3.3	Build resilient water infrastructure. • Address flooding and encourage nature-based solutions to address impacts • Consider environmental justice and habitat impacts related to storm water runoff • Prioritize restoration of low-lying flood-prone areas and natural drainageways. • Prioritize native plants and nature-based, "soft" stabilization and hybrid strategies over methods that rely on concrete channelization or other "hard" infrastructure stabilization methods.	Work is underway on an SDSU-led project located in Imperial Beach entitled "Collaborative Research: Sustainable Water Infrastructure for Adapting to Coastal Climate Change." The focus is on how groundwater shoaling will impact stormwater infrastructure. (see Table 3)
7.	Coastal Resiliency Policy 4.1.4 Policy 4.1.5 Policy 7.1.4	Identify specific coastal adaptation strategies and measures. The strategies will be dependent on the ongoing monitoring, most recent best available science, funding, and community input. • Review lessons learned from local and regional sea level rise adaptation projects, and work with other agencies such as UCSD/Scripps and SDSU to develop appropriate strategies.	The City was awarded an NFWF Grant (See Table 4) to help determine the feasibility of adaptation pathways to build resilience in a manner that is specific to the Imperial Beach Community.

Item #	Topic/LCP Policy	Phased Implementation Work Plan	Status/Timing
		• Conduct additional data analysis and collection to establish the baseline conditions within the City. • Conduct additional data analysis and collection to identify shoreline adaptation strategies that incorporate natural infrastructure such as coastal dunes, living shoreline or other nature-based solutions.	
8.	Adaptation Measures Section 7.1 policies Policy 4.1.4	Develop and implement site specific adaptation measures when warranted based on use of the Sea Level Rise Checklist	Benefits from data gathering and analysis tasks described in Items #6, 7, 9, 10, and 11.
9.	Shoreline Management Plan Shoreline Protective Devices Section 7.1 policies Policy 2.5.18	Develop a Shoreline Management Plan to: • Address appropriate use of shoreline protective devices and natural assets. • Establish Best Management Practices for beach nourishment • Establish requirements for site-specific geo-technical investigations • Explore living shoreline / hybrid facility approaches recommended in 2021 Draft CCC SLR Guidance for Critical Infrastructure • Conduct cost/benefit analysis of adaptation measures • Identify the anticipated economic lifetime of certain types of development (i.e., 75 years). • Ensure that the most vulnerable segments of the community are not disproportionally impacted by the hazards • Incorporate guidance from the Coastal Commission SLR Guidance for Critical Infrastructure report, including Appendix B, #27 on Hard Shoreline Protective Devices and Long-Term Planning.	Continued collaboration with SANDAG, the US Navy, the Port of San Diego and Coronado on regional efforts described in Table 3.
10.	Sustainable Development/ Ecotourism/	Conduct an economic/financial analysis to determine the feasibility of adaptation approaches to flooding, sea level rise, and	The City applied for a grant in 2021 for this purpose that was

Item #	Topic/LCP Policy	Phased Implementation Work Plan	Status/Timing
	Climate Change Policy 2.1.2 Policy 2.1.6 4.1.4	extreme heat to build economic resilience for the City.	unsuccessful. City will continue to pursue funding sources.
11.	Technical Design Guidance 7.1.14	Develop coastal shoreline protection design recommendations based on best available science and local context, for the design and construction of new and replacement seawalls and revetments and/or other structure types, detailed thresholds, minimum beach width, replenishment activities, and mitigation and adaptation measures.	The technical guidance would be completed as a part of the Shoreline Management Plan.
12.	Pilot Projects IP Policy 7.1.2	Prepare site specific studies and action plans for vulnerable areas. • Pursue funding to protect sensitive habitat areas and reduce vulnerabilities of the Seaside Point Neighborhood. Seaside Point is a disadvantaged neighborhood in the southwestern portion of the City of Imperial Beach, situated directly east of the Tijuana River Estuary. • Evaluate completed projects and use the data to inform future projects and LCP amendments.	The City applied for a grant in 2021 for this purpose that was not successful. The City will continue to seek funding for a project to identify opportunities for integrating runoff storage and infiltration enhancements within existing green spaces to create multi-benefit features that preserve existing uses while reducing the risk of flooding.

D. LCP Implementation Plan Expansion

The City's Implementation Plan (IP) is a part of its Local Coastal Program (i.e., The LCP consists of the LUP/GP and the IP). The IP ensures that the policy objectives of the LCP Land Use Plan are met. In Imperial Beach, 87 percent of the City is in the Coastal Zone. Accordingly, the City has chosen to use its entire General Plan as its LUP, and its complete Zoning Ordinance as the IP. The City's General Plan and Zoning Ordinance help shape and guide public projects and policy decisions that serve to implement the Coastal Act, as well as other City goals.

The Zoning Ordinance is a part of the Municipal Code (Chapter 19.06). Its purpose is to protect and promote the public health, safety, morals, peace, comfort, convenience and general welfare. It is intended to implement the City's General Plan and LCP Land Use Plan. The Zoning Ordinance consists of a Land Use/Zoning Map, designated zones; regulations controlling the uses of land, the density of population, the uses and locations of structures, the height and bulk of structure, the open space about structures, the appearance of certain uses and structures, the area and dimensions of sites, the location and size of signs, requirements for off-street parking; and other regulations.

The IP/Zoning Ordinance is implemented primarily through the Coastal Development Permit process. Under its certified LCP, the City of Imperial Beach has the authority to issue most of the CDPs within its jurisdiction. A CDP is required for any project involving development or repair and maintenance activity in areas designated as within the City's coastal boundary, except for projects determined to be exempt pursuant to Section 19.87.040 of the Imperial Beach Municipal Code. The City has posted information on its website to inform applicants of the basic submittal requirements needed to allow staff to accurately analyze and process a CDP application. A CDP may be granted administratively (staff review only) or may require a discretionary review with a public hearing before the City Council for approval.

2022 LCP Update

The RIB project included minor amendments to the City's Zoning Ordinance, which continues to serve as the LCP/IP. In addition, a Local Coastal Program Implementation Plan User's Guide was prepared that provides information on how the Zoning Ordinance is implemented through the Coastal Development Permit process, as well as other permit processes, to provide a greater context of how development is regulated within Imperial Beach. The RIB project emphasized that effective implementation of the General Plan also requires ongoing collaboration with all levels of government, the private sector and other non-governmental organizations. Close communication and continued progress toward meeting mutually beneficial goals is essential, as has been demonstrated through a partnership with the San Diego Unified Port District, who has jurisdiction over the Pacific Ocean shoreline along Imperial Beach, the Imperial Beach Pier, and the state-granted Pacific Ocean Tidelands and submerged lands; and with the Tijuana River National Estuarine Research Reserve, which preserves, protects and manages the Tijuana River Estuary including land within the City of Imperial Beach.

Implementation Plan (IP) Work Plan

Evaluate the following topics shown in Table 1.D below to include as additional IP measures or guidance documents, to build upon the 2022 LCP IP measures.

Table 1D - Implementation Plan Expansion Work Plan

Item #	Topic/LCP Policy	Phased Implementation Work Plan	Status/Timing
13.	Code Amendments/ Detailed IP Sustainable Coastal Design Policy 8.3.1	Adopt code amendments or design guidelines such as increased elevation and flood proofing	Progress will be based on City staff availability and completion of required technical studies
14.	Detailed IP	Add new definitions to the Municipal Code as needed	Progress will be based on City staff availability and completion of required technical studies
15.	Flood Maps	Incorporate updated Federal Emergency Management Agency (FEMA) and Flood Insurance Rate Maps (FIRM) as available as a part of Multi-Jurisdictional Hazard Mitigation Plan updates. Amend related building and zoning codes as needed to protect public safety as needed.	The MJHMP should be updated by 2023.

Table 2 – Summary of Work Plan Measures

Item #	Phased Implementation Work Plan
1.	**ESHA.** Formally map and quantify the ESHA through site-specific studies. Once mapped, design buffers to neighboring sensitive habitat areas to prevent effects that would significantly degrade ESHA and to ensure continued compatibility with the natural areas. This would include significant public outreach.
2.	**Biological Resources**. Convey a clear approach to addressing the biological impacts upon the bay and estuary shorelines as sea level rises, consistent with the Coastal Act call for resources to be "maintained, enhanced, and where feasible, restored" (Section 30230; marine resources) or "protected against any significant disruption of habitat values" (Section 30240; ESHA).
3.	**SLR Assessments.** Update SLR Vulnerability Assessment consistent with the best available and recognized climate change science and/or measurable changes to SLR data at Scripps Pier Tide Gauge, the NOAA tide gauge in the San Diego Bay, and the data logger station at the Oneonta Slough (Estuary).
4.	**Hazards Assessments.** Conduct hazard assessments for critical public infrastructure and facilities of concern including stormwater flood-prone areas. Assess: • Coastal flooding from a 100-year wave event • Coastal erosion • Tidal inundation • Nuisance stormwater flooding • Seismic vulnerability due to groundwater and soil saturation
5.	**Monitoring**. Utilize existing SANDAG Regional Shoreline Monitoring Program transects established in 1999 using 20+ years of baseline data for purposes of monitoring shoreline changes caused by SLR. Utilize the data collection from the Tijuana National Estuarine Research Reserve to monitor the water levels within the Estuary. Utilize the data collection from the NOAA tide gauge located in the San Diego Bay to monitor the water levels within the San Diego Bay**.**
6.	**Water Quality.** Build resilient water infrastructure • Address flooding and encourage nature-based solutions to address impacts • Consider environmental justice and habitat impacts related to storm water runoff • Prioritize restoration of low-lying flood-prone areas and natural drainageways. • Prioritize native plants and nature-based, “soft” stabilization and hybrid strategies over methods that rely on concrete channelization or other “hard” infrastructure stabilization methods
7.	**Coastal Resiliency.** Identify specific coastal adaptation strategies and measures. The strategies will be dependent on the ongoing monitoring, most recent best available science, funding, and community input including: • Review lessons learned from local and regional sea level rise adaptation projects, and work with other agencies such as UCSD/Scripps and, SDSU to develop appropriate strategies • Conduct additional data analysis and collection to establish the baseline conditions within the City • Conduct additional data analysis and collection to identify shoreline adaptation strategies that incorporate natural infrastructure such as coastal dunes, living shoreline or other nature-based solutions
8.	**Adaptation Measures**. Develop and implement site specific adaptation measures when warranted based on use of the Sea Level Rise Checklist.

Item #	Phased Implementation Work Plan
9.	Shoreline Management Plan. Develop a Shoreline Management Plan to: • Address appropriate use of shoreline protective devices and natural assets. • Establish Best Management Practices for beach nourishment • Establish requirements for site-specific geo-technical investigations • Explore living shoreline / hybrid facility approaches recommended in 2021 Draft CCC SLR Guidance for Critical Infrastructure • Conduct cost/benefit analysis of adaptation measures • Identify the anticipated economic lifetime of certain types of development • Ensure that the most vulnerable segments of the community are not disproportionally impacted by the hazard • Incorporate guidance from the Coastal Commission SLR Guidance for Critical Infrastructure report, including Appendix B, #27 on Hard Shoreline Protective Devices and Long-Term Planning
10.	**Sustainable Development**. Conduct an economic/financial analysis to determine the feasibility of adaptation approaches to flooding, sea level rise, and extreme heat to build economic resilience for the City.
11.	**Technical Design**. Develop coastal shoreline protection design recommendations based on best available science and local context, for the design and construction of: new and replacement seawalls and revetments and/or other structure types, detailed thresholds, minimum beach width, replenishment activities, and mitigation and adaptation measures.
12.	**Pilot Projects**. Prepare site specific studies and action plans for vulnerable areas • Pursue funding to protect sensitive habitat areas and reduce vulnerabilities of the Seaside Point Neighborhood. Seaside Point is a disadvantaged neighborhood in the southwestern portion of the City of Imperial Beach, situated directly east of the Tijuana River Estuary. • Evaluate completed projects and use the data to inform future projects and LCP amendments.
13.	**Code Amendments**. Adopt code amendments or design guidelines such as increased elevation and flood proofing
14.	**Definitions**. Add new definitions to the Municipal Code as needed
15.	**Flood Maps**. Incorporate updated Federal Emergency Management Agency (FEMA) and Flood Insurance Rate Maps (FIRM) as available as a part of Multi-Jurisdictional Hazard Mitigation Plan updates. Amend related building and zoning codes as needed to protect public safety as needed.

Contributing & Related Efforts

Table 3 – Regional Collaboration

Regional Collaboration		
Entity	Purpose/Objective	Timeframe
Local Government Working Group comprised of California State Association of Counties (CSAC), the League of California Cities, Coastal Cities Group (CCG) and a California Coastal Commission (CCC) subcommittee	Provided a Joint Statement to serve as a foundation for local governments' collective efforts on phased adaptation to sea level rise planning going forward. The Joint Statement outlined guiding principles, opportunities, challenges, and actions associated with proactive and effective phased sea level rise adaptation for California's coastal communities. It focuses specifically on Local Coastal Program (LCP) policy development, adaptation planning, and project decision-making. Developed framework materials to implement the Joint Statement including: 1) A framework for a phased approach to LCP updates for sea level rise 2) A call for regional approaches to resiliency and adaptation 3) An elevation and concurrence process to support efficient LCP updates 4) A "quick links" reference document including resources for SLR planning and LCP updates. The Framework identifies baseline policies for a successful first round LCP update to address sea level rise acknowledging that phased, future LCP amendments will follow.	Joint Statement adopted by the Commission in November 2020 and laid the foundation for development of next steps regarding how to apply the shared principles. Framework materials to implement the Joint Statement were accepted at Coastal Commission meeting of December 3, 2021.
Caltrans District 11	Caltrans prepared a Climate Change Vulnerability Assessment to describe climate change vulnerabilities to District 11's portion of the State Highway System. It illustrates the types of climate stressors that may affect how highways are planned, designed, built, operated, and maintained. It identifies potential strategies to address the identified vulnerabilities.	Prepared in 2019. Future work is anticipated to identify costs and projects to be implemented.
City of Coronado	The City of Coronado is undertaking a planning process to understand the potential effects of sea level rise and to explore possible mitigation strategies. The sea level rise planning process began by preparing a Vulnerability Assessment, followed by an Adaptation Plan. The **Draft**	The Draft Vulnerability Assessment was out for public review in

Regional Collaboration		
Entity	Purpose/Objective	Timeframe
	Vulnerability Assessment identifies areas in Coronado that are subject to projected sea level rise, rising tides, storm surge, coastal flooding and erosion through 2100. The **Draft SLR Adaptation Plan** provides a variety of possible strategies and approaches that the City and public and private property owners can use to plan for and address impacts identified by the Vulnerability Assessment.	summer 2021. The Draft Adaptation Plan was released in spring 2022. Public hearings are scheduled for summer 2022.
Port of San Diego - Planning	Sea Level Rise Vulnerability Assessment and Coastal Resiliency Report developed an adaptive management planning framework to assess risk and appropriately plan for projected SLR. The adaptive management approach allows the Port District to plan and implement adaptation strategies in the near-term while remaining flexible enough to adjust future strategies in the face of uncertain conditions. Used to inform preparation of the Draft Port Master Plan Update (PMPU) in process. The Vulnerability Assessment completed in June 2019.	The PMPU Draft Program EIR and PMPU was released for public review in November 2021. California Coastal Commission Certification is anticipated in 2023.
Port of San Diego – Pilot Projects	The Port of San Diego, in partnership with the California State Coastal Conservancy and U.S. Fish & Wildlife Service, has begun installation of the South Bay Native Oyster Living Shoreline Project adjacent to the Chula Vista Wildlife Refuge. This project has been years in the making and is the latest of several Port projects to protect the shoreline from impacts related to rising sea levels and to increase the biodiversity of San Diego Bay by creating new marine habitats including new coastal habitat and shoreline protection. The Port of San Diego and ECOncrete®, an eco-engineering company, have launched a three-year pilot project on Harbor Island to demonstrate an innovative new design of ECOncrete's award-winning interlocking COASTALOCK Tide Pool Armor.	December 2021. Funded via grants from the U.S. Fish and Wildlife Service and Builders Initiative.
San Diego Regional Climate Collaborative	**Regional Economic Vulnerability to Sea Level Rise in San Diego County, 2018**. A component of the Resilient Coastlines Project, the Regional Economic Vulnerability study investigated the potential effects from climate change,	Completed in 2018

Regional Collaboration		
Entity	Purpose/Objective	Timeframe
	projected sea level rise, and coastal storms on the economy of San Diego County. Some findings were identified for individual cities. For Imperial Beach, it was noted that the city showed relatively high vulnerabilities to flooding in the 1 meter and 2-meter sea level rise scenarios. Varying impacts to the City's annual sales, employment and GDP were estimated.	
SANDAG	San Diego Forward, the 2021 Regional Plan, provides a long-term plan for the San Diego region that seeks to meet regulatory requirements, address traffic congestion, and create equal access to jobs, education, healthcare, and other community resources. The plan reimagines the San Diego region with a transformative transportation system, a sustainable pattern of growth and development, and innovative demand and management strategies. The shift is critical to creating a more sustainable way of life and helping the region reduce greenhouse gas (GHG) emissions.	Adopted December 10, 2021
SANDAG	The Shoreline Preservation Working Group advises SANDAG on issues related to the adopted Shoreline Preservation Strategy and opportunities for beach replenishment including a Regional Beach Sand Project III which is in the early planning stages. Committee members include elected officials from the coastal cities and representatives from community groups, property owners, environmental groups, state and federal agencies, and Scripps Institution of Oceanography.	Ongoing, the Working Group meets quarterly and has been reorganized to become a "Task Force" beginning in Fall 2022.
SANDAG	In 2018, the San Diego Association of Governments (SANDAG) was awarded Senate Bill (SB) 1 funding via Caltrans to complete the Regional Adaptation Needs Assessment (NA), with partners including the San Diego Regional Climate Collaborative, the Tijuana River National Estuarine Research Reserve, and The San Diego Foundation. The NA looks beyond climate impacts and vulnerabilities and provides an overview of other challenges that jurisdictions face in advancing their adaptation planning efforts. It identifies cross-sector needs and future opportunities for collaboration for the San Diego region. In 2019, SANDAG was awarded an additional SB 1 grant, the Holistic Implementation of Adaptation and Transportation Resilience Strategies project, to leverage the	2018 and 2019 grant awards

Regional Collaboration		
Entity	Purpose/Objective	Timeframe
	findings from the NA. The goal of this project is to comprehensively assess equity, economic, and environmental considerations in existing climate mitigation and transportation planning policies, programs, and projects in the region that intersect with adaptation strategies and to identify efficiencies and opportunities among them.	
SANDAG	Regional Transportation Infrastructure Sea Level Rise Assessment and Adaptation Guidance (SANDAG, 2020) – The Adaptation Guidance analyzes potential sea level rise impacts to transportation facilities that cross jurisdictional lines and includes a compilation of adaptation policies, projects, and funding opportunities that are relevant to the San Diego region.	2020
San Diego State University (SDSU) - National Science Foundation (NSF) Grant	SDSU was awarded NSF funds for a project located in Imperial Beach entitled "Collaborative Research: Sustainable Water Infrastructure for Adapting to Coastal Climate Change." The focus will be on how groundwater shoaling will impact the stormwater infrastructure of communities like Imperial Beach. The SDSU Team is gathering new groundwater data and understanding the connection with SLR, and integrating community perspectives on adaptation strategies.	
Smart Coast California	Smart Coast California describes a phased approach to an LCP update is an appropriate tiered response to SLR. A tiered response is a planning principle that institutes certain defined policies if/when there are specific thresholds of sea level rise that are observed, measured/quantified and documented as opposed to relying only projections only. Their website has a list of each City/County LCP and SLR efforts and the current status.	
US Navy	Navy Region Southwest entered into a Memorandum of Agreement with the Port of San Diego to align their planning initiatives related to projected SLR and coastal flooding. The Navy also participates on the SANDAG Regional Shoreline Management Working Group. The Navy also collaborated with SANDAG on vulnerability mapping to increase military installation resilience through an	Agreement reached in 2018. Collaboration is ongoing. Peer review of the vulnerability mapping was

Regional Collaboration		
Entity	Purpose/Objective	Timeframe
	Office of Local Defense Community Cooperation Grant. The grant study area included Imperial Beach. SR 75 was identified as a critical transportation facility for military readiness.	underway in 2021.
Tijuana River National Estuarine Research Reserve (TRNERR)	TRNERR preserves, protects and manages the resources of the Tijuana River Estuary. Work includes the Tijuana River Sediment Management Work Plan and Monitoring Program Project, and ongoing collaboration related to monitoring SLR impacts on the estuary.	Ongoing

Table 4 – Grant Awards and Applications in Process

Coastal Resiliency Grant Awards and Applications		
Entity/Funding	Purpose/Objective	Timeframe
National Fish and Wildlife Foundation – National Coastal Resilience Fund (NCRF) 2021 $250,000 application	Imperial Beach Community Resilience Plan. The Community Resilience Plan would create an adaptation management and monitoring plan/program that include strategies to address flooding impacts, encourage nature-based solutions, and adequately addresses the needs of the vulnerable populations that are experiencing impacts related to coastal hazards and flooding. The intent of the document would be to identify a way to create an intersection between green nature-based solutions to benefit the environment and protect/serve the vulnerable disadvantaged community members with a focus on environmental justice	Fall 2021 – Fall 2024
California Natural Resources/Ocean Protection Council (Proposition 68) - Bayshore Bikeway Resilience Project $455,000 funded	The Bayshore Bikeway Resiliency Project (Project) will retrofit a 1.2 segment of the San Diego Bayshore Bikeway (Bikeway) to provide multiple benefits to the disadvantaged communities of Imperial Beach including: flood protection, sea level rise (SLR) resilience, enhanced coastal access, and ecosystem resilience. The Bikeway is a heavily used recreational corridor that lies adjacent to the shoreline of the San Diego Bay. The Class 1 Bikeway is the first piece of improved infrastructure along the coastal communities of National City, Chula Vista, San Diego, Coronado, and Imperial Beach. These cities have identified existing or projected future risks to coastal flooding from elevated bay water levels. The Project will seek to repurpose the existing bikeway into a multi-benefit coastal resilience corridor that protects multiple vulnerable communities, a state highway, and the Bikeway itself from current and future coastal flooding while improving coastal access and	5/1/21-10/1/22

Coastal Resiliency Grant Awards and Applications		
Entity/Funding	Purpose/Objective	Timeframe
	adding transitional habitat areas along the bay edge. The project is intended as a proof-of-concept that could be applied along other segments of our "coastal resilience corridor" to protect other City communities with similar needs.	
Tijuana River Sediment Management Work Plan and Monitoring Program State Coastal Conservancy Grant $500,000 funded	The Coastal Conservancy Grant funding the Tijuana River Sediment Management Work Plan and Monitoring Program Project includes two parts: 1) develop a sediment management work plan to maximize the local beneficial reuse of sediment from current and anticipated stormwater management operations in the Tijuana River Valley (Valley); and, 2) develop a technical work plan for and implement baseline water quality and sediment monitoring program. The sediment management element will develop a work plan to evaluate sediment sources, management techniques, and regulatory requirements associated with sediment management activities. The baseline water quality and sediment monitoring program will evaluate cross-border flow water quality and perform activities to characterize sediment quality and trash in order to support project planning and capital project development activities in the Valley.	November 2020 – Winter 2022
Federal Emergency Management Agency (FEMA) - Building Resilient Infrastructure and Communities $15,160,988.50 application submitted	To complete the planning, environmental review, permitting, and construction of the Bayshore Bikeway Resiliency Project.	